The impact of term-time working on college outcomes in China

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ABSTRACT

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This dissertation study focuses on a current and controversial phenomenon in Chinese universities and colleges—student working during academic semesters. The massification of Chinese higher education since the year of 1999 raises the level of competition in the job market of college graduates. More and more undergraduate students participate in work while enrolled, with a hope that the working experience could help them perform better in the job market. However, working during academic semesters might be harmful to students' educational achievement since it may occupy their time and energy for studying. In addition, it may not be able to provide students with valuable practical trainings, as many term-time jobs are low-skill and labor-intensive jobs. Therefore there is an increasingly passionate debate among educational policy makers on whether higher education institutions should encourage students to work during term time. The current Chinese literature consists of mostly sub-national descriptive studies with weak research design that provide little in-depth investigation on this issue. This dissertation is the first empirical study of the impact of term-time working on students' academic performance and early post-college labor market outcomes in Chinese four-year universities and colleges, using much more detailed national data and more advanced methods.

The study employs a sequential explanatory mixed-method research design, involving both quantitative and qualitative methods. In the quantitative analysis, two quasi-experimental strategies including Instrumental Variable and Propensity Score Matching are used to identify the causal impact of term-time working on college outcomes. The data was collected by Tsinghua University in 2011 with a nationally representative sample of 49 institutions and 6,977 graduating students. A qualitative analysis is conducted to explore students' perceptions about the gains and losses from term-time working, in order to explain the quantitative findings. The qualitative data was collected from interviews with 18 working college students in 2 higher education institutions of different types.

Overall, the study finds that working during term time has become a prevalent activity among undergraduate students in four-year universities and colleges in China. The quantitative analysis reveals that term-time working decreases students' academic performance, but increases the probability of being offered a job before graduation, though does not influence the starting salary for those who are offered a job. Such impacts vary for term-time work-study jobs, part-time jobs, and internships. Students in non-elite institutions are more vulnerable to the influence of working than those in elite institutions. The qualitative analysis reveals that students' term-time working behavior is primarily motivated by their financial need and eagerness of gaining social and practical experience, but is constrained by time availability. Term-time working influences students' academic performance through the impact on time allocation and management, and the impact on students' attitude and commitment towards studying. Students may gain valuable practical knowledge and skills and positive work attitudes in working, which contributes to their employability and competitiveness in the labor market. They may also be able to form clearer career goals through working in college. Students' motivation and job characteristics may influence their gains and losses from working. These findings have significant implications for educational policies regarding term-time working in Chinese four-year universities and colleges.

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Chapter 1 Introduction

The purpose of this dissertation study is to examine and understand the impact of term-time working on college outcomes for students in Chinese higher education institutions. In this research, "term-time working" is generally defined as taking paid jobs during an academic semester. "Paid jobs" includes on-campus work-study jobs, off-campus part-time and temporary jobs, and term-time internships. "College outcomes" refers to academic performance and post-college labor market performance. This chapter presents an introduction of this dissertation study. Section 1.1 presents the statement of the problem; Section 1.2 presents the background of the development of Chinese higher education; Section 1.3 provides the definition of key terms; and Section 1.4 explains the organization of chapters in this dissertation.

1.1 Statement of the problem

Working while enrolled is getting more and more prevalent among Chinese college students since mid-1990s when the tuitions and fees of higher education in China started to increase significantly. Though there was no statistics from the Ministry of Education, survey studies in various locations in China showed that many students worked at some point in college, and the percentage had been increased from about 20-30% in studies around the year of 2000 (e.g. B. Li, 2000; Jun Li & Ma, 1999) to about 60-80% in most recent studies (L. Li, Yang, Chen, Wang, & Sun, 2011; Qian, 2011; Ren, Guo, & Pan, 2013; Tong, Ruan, Dai, & Liu, 2011, etc.). This increase might be partly attributed to the policy emphasis on two aspects: the emphasis on work-study programs as an important way to provide financial aid to low-income students, and the emphasis on the function of higher education in practical training. Proponents of student working argue that working during college, no matter on- or off-campus, provide students with both monetary compensations and opportunities to gain practical and social experience (e.g. G. Li, Zhao, & Huang, 2007; Tang & Wang, 2007; Wang, 2000, etc.). Yet recent survey studies have found that most of the term-time jobs taken by students were not related to their academic major or career interests (e.g. Deng, Zhang, Yang, Pang, & Xiao, 2004; Jiaheng Li, 2007; Jun Li & Ma, 1999; Qian, 2011, etc.). Therefore opponents argue that working during academic semesters may not be beneficial, as it distracts students away from studying but cannot provide them with meaningful practical training. This raises a concern about the impact of term-time working on college outcomes. Does working distract students from their real "job"—studying, and therefore harm their educational performance? Does work experience gained during college contribute to students' post-college labor market performance? Should we encourage students to work during college? If yes, what kinds of jobs are good for students? These are the questions that are currently asked by decision makers of Chinese higher education.

Previous Chinese studies provided limited empirical answers to these questions. Though there are about 40 studies with empirical data, most of them just described the patterns of student working in college and students' perceptions about the potential impacts. Very few explored the relationship between working and college outcomes with rigorous research design. Also none of the existing studies explicitly focused on term-time working which may negatively influence students' educational achievement. In order to help Chinese higher education policy makers and higher education institutions establish relevant policies for working students, it is necessary to conduct a conceptually-based and methodologically-sound empirical study to understand the impact of term-time working on college outcomes. With a nationally representative quantitative dataset and interviews with working students, this mixed-method dissertation study serves this purpose. Specifically, this dissertation attempts to answer three main research questions:

RQ1: What is the current situation of student term-time working in Chinese universities?

RQ2: Does term-time working have an impact on college students' academic performance and early post-college labor market performance in China?

RQ3: What is college students' explanation on the impact of term-time working on their academic performance and early post-college labor market performance?

Chapter 3 will explain these research questions in greater details and describe the research design for answering them.

1.2 Background: the development of Chinese higher education

China has the largest higher-education system in the world today in terms of enrollment, with over 31 million students in about 2,800 institutions in the year of 2012, according to the most recent statistics from the Minister of Education (MoE).[1] This section briefly describes the Chinese higher education system and discusses issues occurred during the development of higher education in the past 15 years, in order to provide a background of this dissertation study.

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[1]Data source: http://www.moe.gov.cn/publicfiles/business/htmlfiles/moe/s7567/list.html.

1.2.1 The Chinese higher education system

There are three levels of post-secondary education in China: associated degree education in three-year institutions (or so-called "short-cycle" institutions), bachelor degree education in four-year institutions, and postgraduate education in authenticated higher education institutions and research institutions. This study focuses on the bachelor degree education in four-year institutions. This section describes the categories of four-year institutions, the admission process to undergraduate programs, and the financial aid system to low-income students.

<u>Categories of institutions</u>

According to the MoE statistics, there are 1,145 four-year universities and colleges in the year of 2012. The institutions can be categorized in several ways. First, by ownership and source of funding, there are institutions under the central ministries and agencies, institutions under local authorities, and non-government institutions. The first two types of institutions are public and the non-government institutions are private. According to the MoE statistics, there are 390 non-government institutions in the year of 2012, accounting for 34% of all the four-year institutions. Among these institutions, 303 are so-called "Independent college", which are affiliated to but financially and administratively independent from a public university. These institutions charge higher tuition than regular public institution. Second, the institutions are categorized based on their academic concentrations.[2] The comprehensive institutions and engineering and natural science concentrated institutions have the largest enrollment of undergraduate students. Third, there is a hierarchical structure in the system based on the quality of institutions. In order to improve the quality of higher education in China, the MoE launched two projects to establish world-class universities: the "211" project launched in the year of 1995 and the "985" project launched in the year of 1998. By the year of 2011, there are 112 institutions in the "211" project, and 39 of them are also in the "985" project. These institutions are considered to be the elite institutions in China and receive additional financial support from the central government. Other institutions are non-elite institutions and most of them are under local authorities. As elite institutions receive more funding and resources and provide better education, there is a severe competition to get into these institutions.

Admission to undergraduate programs

The admission to undergraduate programs in China is administrated uniformly at the province level, though several institutions are authorized some extent of autonomy in the recent years. Most college applicants are required to take the National College Entrance Examination (NCEE), which is conducted annually on the same dates across the country. The applicants submit their preference list of the institutions and major

[2] The major concentrations are: comprehensive institutions, engineering and natural science concentrated institutions, agriculture concentrated institutions, forestry concentrated institutions, medical science and pharmacy concentrated institutions, teacher training and education concentrated institutions, language and literature concentrated institutions, finance and economics concentrated institutions, political science and concentrated institutions, physical culture concentrated institutions, art concentrated institutions, and ethnic minority institutions.

programs before or after the NCEE exam, and are assigned to institutions based on their NCEE score and preference. The admission is conducted through four tiers: early admission to some special institutions, 1st tier admission to elite universities, 2nd tier admission to non-elite universities, and 3rd tier admission to short-cycle colleges. The competition is severe and students need to work very hard to get a high NCEE score in order to be admitted by a university of high quality. Therefore those who are admitted to the elite institutions, especially the "985" institutions, are considered to be highly motivated students with high (academic) ability.

The National Low-Income Student Financial Aid system

Prior to early 1980s, higher education in China was free and all college students were subsidized by the government. In the year of 1983, the MoE modified the financial aid policy and changed the universal subsidies to merit-based scholarships. The universities and colleges started to charge tuitions to part of the students in the year of 1985, and to all students in the year of 1989; but the tuition was kept very low until the mid-1990s. The financial aid system was getting completed during this period. New forms of financial aid such as subsidized student loans and work-study wages were introduced into the system. But before the year of 1999, the major form of financial aid was still grants and scholarships, and the most of the funding was from the institution (Yu, 2010). After the expansion of higher education in the year of 1999, the MoE and the Minister of Finance carried out several new financial aid policies, introducing more forms of financial aid and inviting various sources of funding. The goal of the current financial aid system is "equity, adequacy, and incentive", aiming at provide sufficient financial support to all low-income college students (Yu, 2010).

1.2.2 The higher education expansion and related issues

The Chinese higher education has experienced several waves of reform since the year of 1978. The most recent and influential one is the massification of higher education that began in 1999. In the year of 1998, there were only 1,022 higher education institutions with about 3.4 million students. The total enrollment has been increased by almost ten times since the 1999 expansion. This rapid expansion raises some issues to the higher education system.

First, the expansion of enrollment is accompanied by an increasingly serious problem of unemployment of college graduates. The issue first appeared in the year of 2003, when the first cohort of four-year college graduates entered the job market. The number of unemployed college graduates increased by 72.4% in that year compared to the previous year (Yao, 2008). The problem is getting more severe in recent years. Yue (2012) compared the data from five waves of survey with college graduates in the year of 2003, 05, 07, 09, and 11 conducted by Peking University and found that the first unemployment rate of bachelor degree holders kept decreasing from 75.7% in the year of 2003 to 68.7% in the year of 2011.[3] In 2013, according to some news reports, there were about 6.9 million bachelor and master degree holders entering the job market, and less than 30% of graduates in Beijing and Shanghai were employed before graduation.[4]

Second, the massification of higher education brings an increasing number of low-income students into universities and colleges. At the mean time, the expansion raised

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[3] The first employment rate refers to the percentage of college graduates who are offered a job or admitted to graduate schools by June 30th.
[4] Data source: http://news.sohu.com/20130521/n376554609.shtml.

the tuition and fees charged by many institutions (Bai, 2006). These together increase the pressure of the National Low-Income Student Financial Aid system and induce the changes in financial aid polices as described earlier. Though the financial aid package provided to low-income students still cover most of their financial need, the forms have changed from grants and scholarships to multiple forms of aid including work-study and loans (Yu, 2010). In addition, the policies regarding work-study also changed along with the expansion of higher education. The newest policy carried out in the year of 2007 emphasized the role of work-study jobs as both a way to provide financial support to low-income students and a way to improve students' practical skills. This policy encourages participation in work-study jobs.

Third, the rapid expansion of higher education raises a policy concern of the quality of higher education. Bai (2006) summarizes some of the obstacles to maintain high quality in the course of enrollment expansion. First, the supply of quality inputs such as qualified faculty and infrastructure construction cannot catch up with the rapid expansion of the enrollment. Second, many three-year institutions were upgraded to four-year institutions despite of the low capability to provide adequate four-year undergraduate education (Bai, 2006). In addition, with the increasing pressure in job market and the encouraging financial aid policy, more and more students turn to work during college, hoping to improve their competitiveness after graduation. The comparison of empirical survey studies conducted in different years suggests an increasing percent of working college students from about 20-30% in studies around the year of 2000 (e.g. B. Li, 2000; Jun Li & Ma, 1999) to about 60-80% in most recent studies (L. Li et al., 2011; Qian, 2011; Ren et al., 2013; Tong et al., 2011, etc.). This raises another potential threat to the quality of higher education. Though students may gain social and practical experience through working, their academic achievement might be harmed if they work in term time. Therefore whether students could be better off taking jobs in term time should be examined carefully.

In summary, the massification of higher education in China since 1999 aggravates the competition in the job market of college graduates and induces threats to the quality of higher education. In the year of 2010, the MoE announced the *The Outline of the National Plan for Medium and Long-Term Education Reform and Development (2010-2020)*, which pointed out that the major task in the next ten years is to comprehensively improve the quality of higher education. Under this circumstance, it is necessary to examine and understand the impact of term-time working on students' academic performance and labor market performance, so that appropriate policies can be made to improve students' college experience and outcomes.

1.3 Definition of key terms

Several key terms need to be defined before going into further analysis:

Term-time, off-term, and in-college working. As defined at the beginning of the paper, term-time working refers to taking paid jobs during academic semesters. By contrast, off-term working refers to working during summer and winter vacations. In-college working is then a general term refers to working during college years, including both term-time working and off-term working. The reason to differentiate between term-time and off-term working is because students are under different time constraint in term time and in vacations. They may be able to take fulltime jobs in vacations, but can only work part-time in term time. In addition, the impact of term-time and off-term working may be different, as off-term working does not occupy students' time on studying.

Forms of in-college working. Specifically, this study identifies three forms of jobs based on whether the job is on or off campus and whether or not the job is relevant to one's academic or career plan. The three forms are: work-study jobs, "off-campus" part-time jobs, and internships. Work-study jobs are jobs provided through the work-study program of the institution. This category usually consists of service-type jobs in libraries, computer labs, and other school facilities. These jobs provide students with opportunities to get involved in school activities. Therefore they are generally considered as on-campus jobs. "Off-campus" part-time jobs refer to non-academic or career related jobs, such as sales and private tutors. The physical location of these jobs could be either on-campus or off-campus. For instance, a student may work as a campus sales representative for an outside company. Yet, though the physical location of this job is on campus, it does not help the student to be meaningfully involved in school activities (for instance, it does not create opportunities to interact with faculty members or peer students). Therefore these jobs are considered as off-campus jobs for analysis purpose. The third category, internship, refers to part-time jobs that are related to one's academic major or career plan.[5] These jobs are usually offered by outside companies or organizations and thus are generally off-campus. Internships that allow work-from-home are also considered as off-

[5] Most of the internships in China are paid jobs. Unpaid internships during term time would also be included as it may reduce study time.

campus because they do not provide opportunities for students to get involved in school activities.

College outcomes. College outcome is a broad concept. It includes measurable outcomes such as students' educational achievement as measured by academic performance and degree completion and post-college labor market performance as measured by earnings and employment, as well as outcomes that are hard to measure such as knowledge gains, skill improvement, and other cognitive and non-cognitive development. As for this dissertation study, the term "college outcomes" are limited to measurable outcomes. In particular, two kinds of outcomes will be examined: academic performance in college as measured by average course score overall the four years in college; and early post-college labor market performance as measured by initial employment status, i.e. whether the student is offered a job by the time of graduation, and the starting salary offered by the job.

1.4 Organization of the dissertation

The rest of this dissertation proposal is organized in the following way: Chapter 2 reviews previous Chinese and U.S. empirical studies on the impact of term-time working on college outcomes; Chapter 3 explains the research design of this dissertation study, including key research questions, theoretical framework, research methodologies, and data used in the study; Chapter 4 presents the empirical findings on the incidence of term-time working in Chinese colleges and universities; Chapter 5 and 6 present the empirical findings on the impact of term-time working on academic performance and labor market outcomes respectively; and Chapter 7 summarizes the findings and discusses the limitation, policy implications, and suggestions for future studies.

Chapter 2 Literature review

This chapter reviews previous literature on the impact of term-time working on college students' academic performance and labor market outcomes. Most of previous empirical Chinese studies are descriptive with no rigorous research design, except for one recent study by Wu (2011). In addition, none of them has explicitly differentiated between term-time working and off-term working. Therefore empirical U.S. studies on the impact of term-time working are reviewed first in Section 2.1 to provide a preview of the direction and size of potential impact of term-time working on college outcomes, and a discussion of the methodology issues in exploring this problem. Section 2.2 reviews the Chinese empirical studies and discusses the knowledge gaps in the Chinese literature.

2.1 U.S. studies on the impact of term-time working on educational achievement and labor market outcomes

The impact of term-time working is a subject of concern and debate in many countries. For instance, in the U.S., about 74% of full-time undergraduate students worked an average of 23.4 hours per week during the term time in AY2007-08 (NPSAS: 2008). Working during college has become a popular phenomenon among U.S. students, regardless of gender, ethnicity, family income level, and type of institution they attend. This calls attention of U.S. educators and researchers. Many U.S. empirical studies have examined the impact of term-time working on students' educational achievement and post-college labor market performances. This section summarizes the methodologies used in these studies and the empirical findings. For more details, see F. Guo (2012).

2.1.1 Methodologies used in U.S. empirical studies

Both qualitative and quantitative studies were carried out to examine the impacts of term-time working on college students' educational attainment and labor market outcomes. Qualitative studies analyzed interview data in order to figure out common factors among students' perceptions and opinions about the impact of term-time working (Broughton & Otto, 1999; Ketchum-Ciftci, 2004; Kuh, 1995). Quantitative studies used survey and administrative data to examine the relationship between term-time working and students' educational achievement and labor market outcomes. This section discusses methodology issues in quantitative studies regarding data sources, analytical methods, and identification problems.

2.1.1.1 Data sources

There are two main types of data used in the U.S. literature: data collected from single or a small number of institutions, and data from large regional/national surveys. Both data sources have advantages and disadvantages.

Most of the studies that used data from a single or a small number of institutions have a relatively small sample size which is less than 600 (Birdwell & Escovitz, 1990; Broughton & Otto, 1999; Dundes & Marx, 2006; Fjortoft, 1995; Furr & Elling, 2000; Heilman, 1939; Hood, Craig, & Ferguson, 1992; Kuh, 1995; Leisenring, 2011; Nonis & Hudson, 2006; Paul, 1982; Singg, Pilsitz, & Flores, 2005; Warren, LePore, & Mare, 2000). Some exceptions are from Beeson & Wessel (2002), T. Stinebrickner and Stinebrickner (2003), and Wenz and Yu (2010) who used large samples with several thousands of students. The major advantage of working with single or few institutions is that researchers can get relatively rich information for each individual from various sources. For instance, Nonis and Hudson (2006) asked students to maintain a journal during a one-week period to document their allocation of time on various activities each day in the week. The journals served as a more accurate source than the commonly used retrospective data on the time allocation patterns. Some other studies used school administrative records for the information on grades (Paul, 1982) and working hours (T. Stinebrickner & Stinebrickner, 2003). The problem with self-reported data is the lack of accuracy. Individuals might intentionally or unintentionally give an inaccurate answer to questions such as “how many hours did you work last week?” or “what is your Grade Point Average (GPA) in your first year in college?” Such measurement errors might in turn result in serious bias in the final estimates.

Another advantage of using samples from a single institution is that students in the same institution face a homogenous environment and share some common characteristics. When compared to each other, the impact of these common factors will be differenced out. This is important for the validity of the findings, especially for descriptive studies which do not have enough controls for student characteristics. However, the with-in sample homogeneity raises the problem of the external validity of these studies. Since institutions are different from one another, what is true for students in one institution might not be true for those in another. This might explain a part of the large disparity in the findings from these studies, as the institutions being studied are of different types and widely spread over the U.S. For instance, Beeson & Wessel (2002) studied a mid-sized public doctoral university in the Midwest and found a positive impact of term-time working on persistence; Dundes and Marx (2006) collected data from a private liberal arts school in the mid-Atlantic region and found no overall difference between working and non-working students' academic performance; and Leisenring (2011) interviewed students on one California State University campus and found some evidence of a negative relationship between term-time working and school outcomes.

In order to find more generalizable conclusions about the impact of term-time working, many studies used large datasets that were representative at the state or national level. Studies at the state level used administrative data collected by the state board and other state government departments. For instance, Augenblick et al. (1987), Harding and Harmon (1999), and Dadgar (2012) used data collected by the Higher Education Coordinating Board and/or by the State Board of Community and Technical Colleges of Washington State, combined with employment data provided by the Washington State Employment Security Department. Scott-Clayton (2011) used data from a comprehensive database maintained by the West Virginia Higher Education Policy Commission. Using state data allows for a larger sample size that would increase the explanatory power of the estimates. In addition, using administrative records helps to reduce the bias caused by measurement errors. However, a downside is that official records at the state level usually only provide quantitative information about students, such as demographic background, grades, institution type, etc., but no information on students' motivations and behaviors. Using only administrative data will limit the possibility of further in-depth investigations.

Studies at the national level used datasets collected through nationwide surveys. The most commonly used dataset is the National Longitudinal Survey of Youth (NLSY) (Ehrenberg & Sherman, 1987; Hotz, Xu, Tienda, & Ahituv, 1999; Kalenkoski & Pabilonia, 2008; Light, 2001; Molitor & Leigh, 2005). Others include: the Beginning

Postsecondary Students Longitudinal Study (BPS) (Bozick, 2007; Titus, 2010), College Student Experiences Questionnaire (CSEQ) (Lundberg, 2004), Harvard College Alcohol Study (DeSimone, 2008), High School and Beyond Survey (HSB) (Gleason, 1993), National Survey of Student Engagement (NSSE) (Pike, Kuh, & Massa-McKinley, 2008; Tinney, 2006), National Postsecondary Student Aid Survey (NPSAS) (J. King, 2006; T. King & Bannon, 2002), and the Wabash National Study of Liberal Arts Education (Salisbury, Padgett, & Pascarella, 2009; Umbach, Padgett, & Pascarella, 2010). Using national survey data also allows for analysis of large samples. The findings are more representative than studies using data from a specific institution or state. However, as most of these national datasets are collected through questionnaires, they are all are self-reported data. Therefore the findings might be subject to measurement error problems. Kuh (2001) summarized five general conditions under which self-reported data were likely to be valid:

> *"…… They (the five conditions) are:(1) when the information requested is known to the respondents; (2) the questions are phrased clearly and unambiguously; (3) the questions refer to recent activities; (4) the respondents think the questions merit a serious and thoughtful response; and (5) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways" (Kuh, 2001, p. 3).*

As Kuh (2001) argued, national surveys usually employ well-designed instruments that satisfy the above conditions. Therefore data from these surveys should be valid.

2.1.1.2 Analytical methods

Previous quantitative studies can be divided into three general groups based on their analytical methods: descriptive analysis, correlation analysis, and regression analysis. Descriptive studies (Dundes & Marx, 2006; Furr & Elling, 2000; Harding & Harmon, 1999; Hood et al., 1992; T. King & Bannon, 2002; Kuh, 1995; Leisenring, 2011) reported basic statistics such as the means of GPA and percentages of dropout for non-working students and students with different workloads to see whether there were any differences between groups. These studies showed some patterns of the impact of term-time working, but could not ascertain whether the observed differences between working and non-working students were statistically significant. Correlation studies used basic statistic techniques such as Analysis of Variance (ANOVA) (Aper, 1994; Hakes, 2010; Heilman, 1939; Singg et al., 2005), Multivariate Analysis of Variance (MANOVA) (Lundberg, 2004), and correlation tests (Heilman, 1939; Kulm & Cramer, 2006; Pike et al., 2008; Tinney, 2006) to examine whether the relationships between term-time working and student achievements were statistically significant. However these studies could not identify whether term-time working had a causal impact on student achievements, nor could they reveal the magnitude of the impact.

The majority of quantitative studies in this field employed multiple regression analysis to estimate the impact of term-time working on student achievements. The general form of the regression equation is:

$$A_i = \beta_0 + \beta_1 W_i + \beta_2 X_i + \varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2.1)$$

where A_i is a measure of student achievement such as GPA, credits, earnings after graduation, etc.; W_i is the working status which is usually measured by hours worked per week; and X_i is a set of covariates including individual characteristics, family background, and institutional characteristics. The estimated coefficient of W, i.e. β_1, is then the impact of working on the interested outcome A_i.

Methods used to estimate the equation vary according to the type of the dependent variable. Ordinary Least Squares (OLS) regression is often used when the dependent variable is continuous, such as GPA, grade, and earnings. Some studies examining the impact on GPA also used tobit regression as they argued that GPA was bounded between 0 and 4 (Dustmann & Soest, 2006; Wenz, Yu, & Wenz, 2010). Logit and probit models are used when the dependent variable is a binary variable, such as whether dropped out from college, or whether graduated on time (Bozick, 2007; Ehrenberg & Sherman, 1987; Fjortoft, 1995).

The regression equation used by studies estimating the rate of returns to term-time working during college is different from the general equation (Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005). They estimated a Mincer-type wage equation:

$$log(Earnings_i) = \beta_0 + \beta_1 S_i + \beta_2 E_{si} + \beta_3 E_{pi} + \beta_4 E_{si}^2 + \beta_5 E_{pi}^2 + \beta_6 X_i + \varepsilon_i \text{...........} \quad (2.2)$$

where $log(Earnings_i)$ is the post-college earnings in log form, S_i is years of schooling, E_{si} is working experience gained during school years as measured by years of working during school, E_{pi} is post-school working experience as measured by years of working after finishing all the schooling, and X_i is a set of covariates. The estimated coefficient of E_{si}, β_2, represents the income return to working experience gained during school years.

2.1.1.3 Identification strategies

The internal validity of the estimates of β_1 in Equation (3.1) and β_2 in Equation (3.2) is subject to the threat of the endogeneity issue. The "treatment", i.e. working while enrolled in college, is not randomly assigned to students. Instead, students "selected" themselves into the treatment (i.e. working) and control (i.e. non-working) groups. There might be some factors that simultaneous influence students' decision on term-time working and potential college outcomes, for instance, individuals' ability and motivation. Failing to control for these variables would induce bias to the estimation of the impact of term-time working on college outcomes. The endogeneity problem will be discussed in more details in the methodology chapter. This section focuses on the strategies used in previous U.S. studies to address this problem. In general, there are three major categories of strategies to address the endogeneity problem: controlling for covariates, modeling students' selection process, and constructing control groups.

Controlling for covariates

Many previous studies dealt with the endogeneity problem by including measures of student ability and motivations in addition to other covariates in the estimation equation. The most commonly used control for student ability is students' GPA in previous semesters or in high school (Augenblick & Van de Water, 1987; Cuccaro-Alamin & Choy, 1998; Ehrenberg & Sherman, 1987; Fjortoft, 1995; Paul, 1982; Scott-Clayton, 2011; Titus, 2010), and their American College Testing (ACT) or Scholastic Aptitude Test (SAT) scores (Moore & Rago, 2009; Scott-Clayton, 2011). Heilman (1939) also used intelligence score as a measure of ability. Bozick (2007) controlled for "academic preparation" as measured by high school GPA and the highest math course taken by the student in high school. Only a few studies controlled for students' motivation. A study by Gleason (1993) used a variety of attitude variables to measure the level of motivation. Some other studies used high school employment status as an index of students' work preference (Bozick, 2007; Scott-Clayton, 2011).

The problem of using this "selection on observation" strategy is that it cannot rule out the impact of other unobservable or immeasurable factors that are not included in the estimation equation. For instance, students' high school employment status cannot fully capture their job preference since their motivations and preferences might have changed after enrolling in college. It is also possible that a student's term-time working behavior and academic performance are simultaneously influenced by an unexpected person-specific external shock. For instance, a family emergency event might force students to take more family obligations. They might have to work more to support the family and spend more time with their family members, and therefore have less time available for studying. If their GPA drops in this case, it is difficult to distinguish whether the drop is caused by the increased working hours or the increase in family hours. This kind of event is hard to observe through survey questionnaires and therefore cannot be controlled for using regular covariates.

Modeling students' selection process

Another strategy to address the endogeneity problem is to model students' selection process (Hotz et al., 1999; Kalenkoski & Pabilonia, 2008). The idea is to estimate a selection function that captures students' decision on working status and an impact function based on the decision made:

$$W_{i,t}^{*} = \alpha_0 + \alpha_1 Z_{i,t} + \varepsilon_{i,t} \quad \text{(3.3)}$$

$$Y_{i,t} = \beta_0 + \beta_1 W_{i,t} + \beta_2 X_{i,t} + \mu_{i,t} \quad \text{(3.4)}$$

and $W_{i,t} = W_{i,t}^{*}$ if $W_{i,t}^{*} > 0$,

$W_{i,t} = 0$ if otherwise,

where W_i^* is the latent variable capturing students' desired working status influenced by a set of exogenous covariates Z_i, W_i is the actual working status, Y_i is the observed outcome (academic achievement or labor market performance, and X_i is a set of exogenous covariates influencing Y_i. Kalenkoski and Pabilonia (2008) used county unemployment rate, an indicator for the existence of a state work-study program in addition to the federal work-study program, and student wage to predict the latent hours of working in Equation (3.3) and excluded them from Equation (3.4) when estimating students' GPA. By doing so, the working variable becomes exogenous if the additional covariates included in Equation (3.3) are uncorrelated with Y_i.

The endogeneity problem of this model is, as pointed out by Hotz et al. (1999), that the error terms in the two equations might still be correlated after controlling for Z_i. They might be subject to dynamic selection bias that some common factors might influence them simultaneously. To deal with this problem, Hotz et al. (1999) created a dynamic discrete-choice control by assuming a random effects error structure in which the error terms were assumed to be determined by a common person-specific disturbance and two uncorrelated idiosyncratic disturbance terms. Another problem is that students' decision on working status W_i^* might also be influenced by their previous GPA ($Y_{i,t-1}$). In this case, the validity of the estimate of β_1 is subject to the serial correlation bias. Neither of the studies provided solutions to this problem.

Constructing control groups (quasi-experimental design)

Some recent studies began to use quasi-experimental designs to address the endogeneity issue. The idea is to create a situation similar to the scientific experiments where subjects are randomly assigned into treatment and control groups. The common strategies include instrumental variable (IV) design, fixed effect (FE), difference-in-difference (DID) design, propensity score matching (PSM), and regression discontinuity (RD) design. Some of these strategies were used by empirical studies on the impact of term-time working.

To estimate the causal impact of a treatment, one needs to compare the outcome of the treated to the potential outcome of the same people if they had not been treated. In the case here, it is to compare students' educational attainments and post-college labor market performance if they had or had not worked during college. However, it is impossible for a person to be in the treatment and control group simultaneously. A way to solve this problem is to find a comparable control group that is similar to the treatment group in every observed aspect except the treatment status. Theoretically, the best way to construct such a group is to randomly assign the subjects into treatment and control groups. However, it is not feasible in the real world to assign students into different working status, because it depends on students' own choice in most cases. Therefore quasi-experimental designs are employed to construct the control group. Strategies used by previous studies to identify the causal impact of term-time working include the individual fixed-effect approach (Dadgar, 2012; Stinebrickner et al., 2003; Wenz et al., 2010) and the instrumental variable approach (Dadgar, 2012; DeSimone, 2008; Kalenkoski & Pabilonia, 2008; Light, 2001; Scott-Clayton, 2011; Stinebrickner et al., 2003; Titus, 2010).

a. Individual fixed effect (FE)

The individual fixed-effect strategy compares the achievements of the same students over a time period before and after their working behavior changed. The key idea is to subtract out the time-invariant variables which can simultaneously influence the treatment status and potential outcomes, for the case here, students' ability, motivation, and family background etc., by comparing the outcomes of the same individual across time. The core assumption is that no unobserved time-varying variable has an influence on the outcome after controlling for covariates. A longitudinal dataset with repeated observations of the same individual is required to apply this strategy.

Stinebrickner and Stinebrickner (2003) and Dadgar (2012) both used the individual fixed-effect strategy to identify the impact of working intensity on students' academic performance. The former study compared the academic outcomes for the same students in a small liberal arts college over their first two semesters, while the latter compared the GPA of students in community and technology colleges in Washington State across their first three quarters. In addition to individual fixed effect, Dadgar (2012) also included quarter fixed effect to control for quarterly differences that affected all students.

In their study at a traditional public university in Southeastern Minnesota, Wenz and Yu (2010) used a strategy similar to individual fixed-effect to control for unobserved individual characteristics. Taking advantage of a longitudinal dataset collected by the institution's annual survey over four years, the authors estimated a first difference model:

$GPA_{i,t} - GPA_{i,t-1} = f(W_{i,t} - W_{i,t-1}\ Q_i, Z_i)$ ……………(Equation 4 in Wenz & Yu, 2010)

where W_i is the working behaviors, Q_i is a measure of student ability, and Z_i is a set of control variables. By doing so, time-invariant individual characteristics were subtracted out and the estimated coefficient of the working behavior variable indicated how GPA changed as individuals adjusted their own working behaviors. Wenz and Yu (2010) found that the estimated coefficient of working behavior changed from significantly positive to significantly negative when using the first-difference strategy instead of the cross-sectional OLS estimators. They concluded that some unobserved differences between students who chose to work and students who chose not to work had led to higher GPA for working students. Failing to control for these factors would result in an overestimate of the real impact of working.

The major shortcoming of individual fixed-effect strategy is that many unobservable/unmeasurable factors that influence students' working decisions and academic outcomes actually vary across time. For instance, as pointed out by Stinebrickner and Stinebrickner (2003) and Dadgar (2012), students might choose to work more when the study burden is not heavy. If this is the case, individual fixed-effect estimators might underestimate the negative impact of working on academic performance. Another weakness of this strategy is the sample selection bias issue. Students have to be enrolled in college during the period under study in order to be included in the sample. Those who dropped out at any time during this period will be excluded because no observation can be obtained after they dropped out. This will also lead to an underestimation of the negative impact of working.

b. Instrumental variable (IV)

Many U.S. studies used Instrumental variable design to address the endogeneity problem when estimating the impact of term-time working (Dadgar, 2012; DeSimone, 2008; Kalenkoski & Pabilonia, 2008; Light, 2001; Scott-Clayton, 2011; Stinebrickner et al., 2003; Titus, 2010). The IV strategy is applied with a two-stage design: first predict the treatment status of each individual with the instrumental variable and then estimate the outcome function using the predicted treatment status instead of the actual status. The details of this procedure will be discussed in the methodology chapter. This section summarizes the instrumental variables used in pervious U.S. studies.

In practice, the most commonly used instrumental variables are external factors that influence job availability, such as local labor market conditions and work-study type financial aid policies. One measure of labor market condition is local unemployment rate. It is a plausible IV because it reflects the demand of the labor force but is exogenous from students' working decisions and does not have a direct impact on student academic achievement. It was used in a Finnish study examining the impact of term-time working on post-college labor market earnings (Häkkinen, 2006). As for the U.S. case, some studies on the impact of working during high school used the local unemployment rate as the IV (Rothstein, 2007), but no example was found in studies on working college students. Instead, it was included in the student decision equation in some studies employing simultaneous equation models (Dustmann & Soest, 2006; Kalenkoski & Pabilonia, 2008). One problem with using the unemployment rate as an IV is that the correlation between unemployment rate and term-time working might be very weak, as most of the jobs are temporary, part-time, or on-campus jobs which may not be influenced by the unemployment rate in the labor market (DeSimone, 2008).

Dadgar (2012) used another labor market demand feature to instrument students' term-time working hours under a DID framework. The author pointed out that students working in the retail industry were able to work more hours in the fall quarter than in the winter quarter because there were more jobs during the holiday shopping season, while students working in other industries did not experience such a temporary increase in job supply through the quarters. Therefore she compared students in retail and non-retail jobs over the fall and winter quarters. The actual instrument of working hours was the interaction between the fall quarter dummy and being in the retail industry. This IV-DID design satisfied both the independence and the exclusion restrictions because the double comparison can simultaneously control for systematic differences between the treatment and control groups and between the two time periods.

Another commonly used IV is work-study type financial aid policies that require aid recipients to work, as these policies are independent of students' working decisions and academic performance. Taking advantage of the institutional financial aid policy of Berea College which randomly assigned all incoming students to different service-type jobs, Stinebrickner and Stinebrickner (2003) instrumented students' hours worked in the first semester with their initial job placement. As the availability of working hours differed according to job position, how many hours students could work was determined by the position they were assigned to. In this case, the instrumented hours worked became exogenous to students' decision. Similarly, Scott-Clayton (2011) constructed an instrument for Federal Work-Study (FWS) participation based on the availability of FWS positions in West Virginia colleges. She argued that as the allocation of FWS positions across colleges could not be controlled by students, an FWS-eligible student was less likely to participate in work study in an institution with few FWS positions than in an institution with more positions. To address the validity threat caused by non-random allocation of FWS positions across colleges, Scott-Clayton employed a DID framework and compared eligible and ineligible students across institutions with high- and low-FWS allocation. The actual IV was an interaction between individual eligibility for FWS and institutional allocation of FWS positions. Because the systematic differences between eligible and ineligible students and between institutions with different availabilities of FWS positions were both controlled by the DID framework, the IV estimator was able to reveal the real impact of participation in work-study programs.

In addition to influential factors on job availability, factors that influence students' motivations for working were also used as instruments for working hours. For instance, the instrumental variables in DeSimone (2008) were parental schooling and being raised Jewish. The intuition was that Jewish fathers and fathers with more schooling put more emphasis on the education of their children and provided more financial support, and therefore the children did not have to work during school. The problem with using these instruments was that the father might influence the children's academic performance in other ways. DeSimone addressed this problem by controlling for age, maternal schooling, type of postsecondary institution, and attainment of schooling.

Most of the studies using IV design found a negative impact from working additional hours on GPA. It should be noticed that, although instrumental variable strategy is useful in constructing proper comparison groups, the IV estimators only reveal a Local Average Treatment Effect (LATE). In the case here, it only reveals the impact on individuals whose working behavior was changed by the instrument. For instance, in Stinebrickner and Stinebrickner's study, their IV estimation reflects the impact on students who worked more hours because they were assigned to jobs with more hours available and who would not otherwise have worked that long (i.e. the compliers). There might be students who declined to work more even if they were offered additional hours (i.e. the never takers). The impact of working more hours might be different for the never takers than the compliers. Assuming that students are rational people who make decisions to maximize their utility, declining the offer to work more hours indicates that the student perceives a negative impact on her utility from working additional hours. By contrast, the compliers are those who believe they can benefit from working more hours. Therefore the actual impact might be more negative for never takers than for compliers.

2.1.2 Empirical findings in previous U.S. studies

2.1.2.1 Impact on academic performance

U.S. empirical studies of the impact on academic performance found mixed findings. Some studies provided supportive evidence to the widespread concern of negative relationship between working and grade (Dadgar, 2012; DeSimone, 2008; Kalenkoski & Pabilonia, 2008; T. King & Bannon, 2002; Kulm & Cramer, 2006; Leisenring, 2011; Paul, 1982; Stinebrickner et al., 2003; Tinney, 2006; Wenz et al., 2010). For instance, studies using advanced econometric strategies revealed a statistically significant negative impact of working on students' GPA (Dadgar, 2012; DeSimone, 2008; Kalenkoski & Pabilonia, 2008; Stinebrickner et al., 2003; Wenz et al., 2010). These studies show that, if a student works 10 more hours per week, her GPA would be reduced by about 0.04 to 1.62 points. These negative findings can be explained with the student invovlement theory (Astin, 1984). The theory suggests that students' academic achievement is determined by time and effort devoted to studying. Because time and energy are limited, as a student spending more hours on working, she would have less hours and engergy available for studying and therefore her GPA would be harmed. The negative correlation between hours worked and GPA revealed by the U.S. studies is consistent with this theory.

However, there is also some contradictory evidence suggesting that working did not hinder study (Augenblick & Van de Water, 1987; Birdwell & Escovitz, 1990; Broughton & Otto, 1999; Curtis & Nummer, 1991; Dundes & Marx, 2006; Ehrenberg & Sherman, 1987; Fjortoft, 1995; 1983; Harding & Harmon, 1999; Heilman, 1939; Nonis & Hudson, 2006; Scott-Clayton, 2011; Titus, 2010; Trueblood, 1957). There could be at least two explanations of the insignificant results. First, the time spent on working may not be taken from study but from leisure activities. In this case, working during term time does not reduce time and effort on study and therefore will not influence students' academic performance. This is a possible situation as some of the survey study found that some students just work in order to fill extra time in their schedule (Dundes & Marx, 2006). A second scenario is that students improve their learning skills from work and become more efficient in time use. Therefore though there is less time for study, they are still be able to keep a good academic record. This is also possible in practice. An investigation by Dundes and Max's (2006) in a private liberal arts college showed that a large percent of working students believed that employment did not hurt their grades because working forced them to become more efficient and organized.

Another group of studies revealed non-linear impact of term-time working on academic performance (Gleason, 1993; Hood et al., 1992; McCormick, Moore, & Kuh, 2010; Moore & Rago, 2009; Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1998; Pike et al., 2008). These studies found that, while heavy workload might lead to lower grade, moderate work might not be detrimental. Therefore whether the impact of term-time working on academic performance is negative or not is largely influenced by work intensity. There might be an optimal amount of hours spent on working.

In summary, the U.S. studies of the impact of term-time working on students' academic performance show a mixture of contradictory findings. Besides explanations given in above discussion, the inconsistency might be due to the differences in data and methodologies. First, many of the U.S. studies used data from a single institution located in different states with different student bodies. As a result, the sample composition varied a lot across studies, making the findings incomparable with each other. Second, many studies used simple descriptive and correlation analysis, with no control of student and job characteristics. As students' term-time working decision may be correlated with individual characteristics such as ability and motivation, the term-time working status is not exogenous. Findings in descriptive and correlation analyses which fail to address this issue are subjected to selection bias.[6] Overall, quasi-experimental studies which addressed the endogeneity issue suggested a negative causal impact of increased hours of working on students' academic performance. However, it is worth noting that these estimates reflect only the impact of marginal changes in working hours for students with some certain levels of working. Therefore these studies cannot rule out the possibility that the impact of working is non-linearly correlated with hours worked.

[6] The source of selection bias and identification strategies will be discussed later in Section 5.2.

2.1.2.2 Impact on post-college labor market performance

A number of U.S. studies have examined the impact of term-time working on students' post-college labor market performance (Gleason, 1993; Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005; Stern & Nakata, 1991; Titus, 2010). These studies consistently found a positive relationship between working during college and post-college earnings.

Stern and Nakata (1991) compared simulated rates of return to higher education investment among working and non-working college students with aggregated statistics. They found that it would be beneficial to work for students who enrolled as long as they could graduate on time. Even for dropouts, work experience during college was worthwhile, especially for those who stayed in college for only two years. But if a student has to stay longer in college because of work, she would face a lower rate of return than if she could graduate on time without working.

Empirical studies with national datasets found similar findings to Stern and Nakata's (1991) simulations (Ehrenberg & Sherman, 1987; Gleason, 1993; Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005; Titus, 2010). Three studies using the National Longitudinal Survey of Youth (1979) dataset showed that the marginal returns to work experience gained in college ranged from 4.6-5.6% and tended to be diminishing over time (Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005). In addition, Hotz, et.al's (1999) found that the estimated rate of return dropped about 3 percentage points when control for the endogeneous selection bias, indicating that it was important to address the endogeneity problem.

In summary, the U.S. studies revealed a positive relationship between hours worked during college and labor market performance after graduation. These findings suggest that term-time working may be beneficial to students' post-college success, though it may have some negative impact on students' educational achievement as showed in studies discussed in previous section. From a human capital theory perspective, this indicates that students have gained some working-related human capital through term-time working, which offsets the potential loss in school-related human capital due to reduced time of studying.

2.2 Previous Chinese studies on in-college working

The searching of Chinese literature is conducted in China's two largest online dataset of academic journals, i.e. CNKI.net and Wanfang Data, with "part-time work", "work-study", "term-time working" as the key words (all in Chinese). About 90 studies were found from 1999 to 2014. Over half of them were institutional level policy papers. About 40 studies investigated college students' working behavior in different areas with different samples of students with empirical data. Two of them did not provide any information about their sample and are therefore not included in this review. There is a Chinese dissertation by Wu's (2011) which used econometric strategies to estimate the impact of in-college part-time working on students' academic performance and labor market outcomes. However, because of the limited access to the full text of the dissertation, no information is known about the research design of this study. The majority of other studies are descriptive studies based on student surveys and/or interviews. These studies provide some evidence on the current situation of in-college working in China, with regards to the prevalence of term-time working, students' attitude and motives of working, characteristics of term-time jobs, and students' perceptions about gains and losses from term-time working. This section summarizes the findings from available empirical studies.

2.2.1 Data source and methods

The 38 empirical studies covered more than 20 provinces in Mainland China, but most of them were conducted in the major city of the province. About half of the surveys were conducted in a single institution. Other studies surveyed a small number of institutions in local area. Only one study, T. Li (2011), used a sample of 58 institutions in 16 provinces; but the sample size of this study was only 247. The sample size of most other studies was not large as well. 12 of the studies had a sample size smaller than 200 students. 3 studies surveyed around 1,000 students, and 1 study surveyed 3,000 students. The sample size of the rest studies was between 300 to 600 students. With regards to sample composition, most studies used a random selected sample which was mixed in gender, major, and grade. The dissertation study by Wu (2012) used data collected in a municipality. But as the full-text of this study is not accessible, no information about the sample size and composition can be provided at this stage.

With regards to the data collection and analytic methods, most studies used questionnaires to collect data and employed descriptive methods to analyze the data. There are 6 studies that conducted interviews with working students and institution administrators in addition to student surveys. But none of them provided detailed analysis with the interview data. There are three studies that used econometric methods in the analysis. L. Jing & Sun (2010) examined the determinants of participation in in-college working and the income from working with regressions with a sample of 134 students majoring in marketing in a single institution. Ren, J.Guo and Pan (2013) estimated the impact of in-college working on labor market performance with 155 graduates from a single institution. Wu's (2011) study estimated the impact of part-time working in college on both academic performance and labor market performance with econometric methods, but the details about the research design is not available.

2.2.2 Summary of empirical findings in previous studies

According to previous survey studies, a large proportion of undergraduate student have some working experience in college. Generally, the percentage of students who ever worked during college is higher in recent studies (about 60% to 80%) than in studies before 2005 (less than 50%). In addition, the survey studies found that students did not work intensively. They usually worked for less than 10 hours per week, and most students worked in weekends (Bao, Tao, Jiang, Wang, & Qi, 2010; Chen, Zhang, Ye, & Sun, 2005; Cheng & Wang, 2010; Qian, 2011; Ren et al., 2013; X. Wang & Li, 2008; Yuan, Ren, & Ouyang, 2009; M. Zhang & Wu, 2008; Zhao & Hao, 2010). Some studies also found that the percentage increased as the grade increased (Chen et al., 2005; Jun Li & Ma, 1999; X. Wang & Li, 2008; Zhao & Hao, 2010; Zhou & Chen, 2010).

With regarding to students' attitude and motives of in-college working, many studies found that most students had a positive attitude towards part-time working during college, even among students who never worked (Bao et al., 2010; Cheng & Wang, 2010; B. Chu, Yang, & Ma, 2010; X. Jiang, 2005; Y. Li, 2012; Ma, 2012; Tong et al., 2011). The primary reason for most students to work was to gain social experience and to improve competitiveness (Cheng & Wang, 2010; B. Chu et al., 2010; S. Jing, Wu, & Zhao, 2005; Jiaheng Li, 2007; T. Li, 2011; Z. Li & Ni, 2006; Ma, 2012; Qian, 2011; S.

Wang, 2010; Yuan et al., 2009; M. Zhang & Wu, 2008; L. Zhu, Li, & Xu, 2009). Monetary compensation is also an important incentive to work. About 20% to 40% students reported this as the primary reason to work (B. Chu et al., 2010; Y. Deng et al., 2004; Jiaheng Li, 2007; Z. Li & Ni, 2006; Ma, 2012; Qian, 2011; S. Wang, 2010; Yuan et al., 2009; M. Zhang & Wu, 2008; Zhao & Hao, 2010; L. Zhu et al., 2009). Besides these two major reasons, studies also found that there were some other reasons for students to work, such as to spend spare time, to make friends, and to follow other students (B. Chu et al., 2010; S. Jing et al., 2005; L. Li et al., 2011; Ma, 2012; S. Wang, 2010; M. Zhang & Wu, 2008). Parents' attitude towards in-college working was also important for students' decision on whether to work. Jun Li & Ma (1999) found that some students did not work in college because their parents did not support them to do so. Using multiple regression methods, Z.Jing, Lv, and Sun (2010) showed that parents' attitude had a statistically significant impact on students' participation in working. Students with parents who supported in-college working were more likely to work and earned more from working.

Previous studies revealed some characteristics of in-college jobs taken by college students. First, most students took service-type labor-intensive jobs such as sales, flyer distributers, and restaurant waiters; only a few worked in jobs that required special skills such as private tutoring, accountants, designers, journalists, and IT managers (Chen et al., 2005; S. Jing et al., 2005; Guanghong Li & Hu, 2003; Mi, 2004; X. Wang & Li, 2008). Second, many of the jobs taken by students are not related to their academic major (S. Jing et al., 2005; B. Li, 2000; Qian, 2011; X. Wang & Li, 2008; Zhao & Hao, 2010; L. Zhu et al., 2009), except for those in some specific majors such as foreign languages, finance and business management, and physical education (B. Chu et al., 2010; Jun Li &

Ma, 1999; M. Zhang & Wu, 2008; Zhou & Chen, 2010). Third, most of the term-time jobs are temporary or short-term jobs.

With regarding to gains from in-college working beside monetary compensation, studies showed that most of the working students reported increased social and work experience and improved soft skills such as interpersonal skills and problem solving skills (Y. Deng et al., 2004; Y. Li, 2012; Z. Li & Ni, 2006; Qian, 2011; S. Wang, 2010; Zhao & Hao, 2010; Zhou & Chen, 2010; L. Zhu et al., 2009). Most students did not perceive negative influence on academic performance (Bao et al., 2010; Jun Li & Ma, 1999; Zhengfa Liu & He, 2005; Mi, 2004; Qian, 2011; Zhao & Hao, 2010). Some students even reported positive influence as they found that working brought them new knowledge and provided more incentives of learning (Jun Li & Ma, 1999; X. Wang & Li, 2008; Zhao & Hao, 2010). However, about one-third working students admitted that there was time conflict between work and courses and many reported that they sometimes skipped class in order to work (B. Chu et al., 2010; Jiaheng Li, 2007; L. Li et al., 2011; Qian, 2011; X. Wang & Li, 2008; Zhao & Hao, 2010; L. Zhu et al., 2009).

Despite the above descriptive studies, very few prior studies have estimated the impact of term-time working on students' academic performance and post-labor market performance with econometric methods. Wu's (2011) dissertation found that there is a non-linear relationship between students' academic performance and part-time working in college. Moderate working may improve students' academic performance, while intensive working would have a large negative impact on academic performance. Her study also found that part-time working in college improves the probability of being employed after graduation, but has a negative impact on initial salary. Ren, J. Guo, and

Pan (2013) used a small sample from a single institution to estimate the relationship between part-time working in college and whether being offered a job after graduation. They found that taking part-time jobs in college is not associated with the probability of being offered a job, but taking internships in college is statistically significantly and positively associated with the probability.

Studies on post-college job placement also provided some evidence about the impact of working in college on labor market outcomes. H. Li, et.al (2012) which used the same data source as this study (but a different year data) found that having some part-time working experience in college is significantly negatively associated with the starting salary, but is positively associated with the probability of observing a starting wage (being offered a job and reported the wage in the survey). Some other studies provided evidence about the impact of doing internships (Du & Yue, 2010; He & Zhang, 2006; Huang, 2007; Lai, Meng, & Su, 2012; Qing & Zeng, 2009; Qing, 2012; Xie & Li, 2010; Yue, Wen, & Ding, 2004). Some found that taking internships during college may change students' expectation of jobs after college (S. Zhu, 2010), and may also increase the probability of obtaining a job before graduation and the initial salary (Du & Yue, 2010; He & Zhang, 2006; Xie & Li, 2010; Yue et al., 2004). Some others found no significant associations with in-college working participation and starting salary (Du & Yue, 2010; Lai et al., 2012; Qing & Zeng, 2009; Yue et al., 2004). In addition, two studies by Qing (2012) and Qing & Zeng (2009) showed that internships that are relevant to students' academic major have a significant positive impact on the probability of being offered a job, but internships in irrelevant field do not have significant impact (Qing 2012).

However several caveats need to be kept in mind when using these studies to understand the impact of term-time working. First, none of these studies explicitly differentiated between the jobs taken in term time and jobs taken in vacations. As students are able to work full time in vacations, off-term working is not supposed to influence their academic performance, but may have a larger impact on their labor market outcomes. Second, the findings of studies which only examined the impact of internships may not be generalized to other forms of term-time working, as internships are very different from other jobs in that they are more closely related to students' academic major or career plan. There is some evidence in previous study that major-irrelevant internships and part-time jobs do not influence the probability of being employed right after college (Qing, 2012; Ren et al., 2013). Third, most of these studies measured in-college working experience with a dummy variable. Therefore the findings just revealed aggregated impact of participation in in-college working. Last but not least, none of these studies controlled for the endogeneity problem of internship. As suggested the U.S. empirical studies, this would bias the estimated impact of in-college working.

In summary, previous Chinese studies reveal that in-college working is a popular phenomenon in Chinese universities and colleges. Many students work to gain social experience and/or monetary compensations, or just to spend spare time and to catch up with other students. The jobs taken by most students are temporary labor-intensive jobs that are not related to their major. With regards to the impact of in-college working, descriptive studies find that the most commonly reported gain from working is social experience and soft-skills. Many students do not perceive negative impact of working on academic performance, but one study using econometric methods suggests that heavy work has a large negative impact on academic performance. As for the impact of working on post-college labor market performance, the previous studies provide some evidence of the positive impact of taking internships during college, but the findings may not be generalizable to other types of jobs taken during academic semesters.

2.2.3 Knowledge gaps in pervious Chinese studies

Though previous Chinese studies provide some evidence about the situation and potential influence of in-college working in Chinese colleges and universities, the impact of term-time working is still an unexplored problem in China. Specifically, there are several knowledge gaps in the Chinese literature:

First, no study has used national data to investigate this problem. Though previous survey studies covered more than two third of the province in China, there is no nation-wide record on the incidence of in-college working in Chinese universities and colleges.

Second, no study has conducted in-depth investigation on students' experience and perceptions of in-college working. Though previous studies revealed some of the reasons for students to work in college with survey and interview data, few of them examined the determinants of students' working behavior and explored students' working experience in details.

Third, no study has explicitly differentiated term-time and off-term working. As students are under different time constraint in term time and in vacations, their working behavior and the impact of working may all be different.

Fourth, few studies have empirically examined the impact of term-time working on academic performance and post-college labor market outcomes with rigorous research design. The existing studies using econometric strategies have some methodology drawbacks, such as the failure to deal with endogeneity of term-time working.

Overall, previous Chinese studies are plagued by data and methodological weaknesses; and they provide only limited evidence on the impact of term-time working on students' college outcomes. More rigorously designed studies using more advanced econometric methods and more comprehensive data with national coverage are needed to develop an in-depth and more complete understanding of term-time working in Chinese colleges and universities. This dissertation study aims at filling the above knowledge gaps.

Chapter 3 Research design

This dissertation study aims at exploring the impact of working during term time on college students' academic performance and early post-college labor market outcomes with both quantitative and qualitative methods. This chapter presents the methodological design of the study. Section 3.1 states the key research questions. Section 3.2 presents the theoretical framework that guides the whole study. Section 3.3 presents the research methodologies, starting with an overall description of the mixed-method design and followed by a description of the quantitative research methods and a description of the qualitative research methods. Section 3.4 describes the data sources and samples for the quantitative and qualitative inquiries respectively.

3.1 Key research questions

This study has three main research questions:

RQ1: What is the current situation of student term-time working in Chinese universities?

RQ2: Does term-time working have an impact on college students' academic performance and early post-college labor market performance in China?

RQ3: What is college students' explanation on the impact of term-time working on their academic performance and early post-college labor market performance?

The purpose of asking the first research question (RQ1) is to learn about the incidence of term-time working in Chinese universities and colleges. It describes the context of this study. Previous studies summarized in the literature review section are all focused on local areas and regions. This study explores the situation at the national level with a nationally representative dataset. Specifically, it answers the following sub-questions:

RQ1.1: What percentage of college students work during the term time?

RQ1.2: What are the characteristics of college students who work and how do they differ from college students who do not work?

RQ1.3: What types of job do the working students take?

The second research question (RQ2) is the major research question of this study. It aims at examining the impact of term-time working on students' academic performance and early post-college labor market performance. These are the two major college outcomes of policy concerns. There are three sub-questions of RQ2:

RQ2.1: Does term-time working have an impact on students' academic performance?

RQ2.2: Does term-time working have an impact on students' early post-college labor market performance?

RQ2.3 Does the impact on academic performance vary by the forms of job (work-study jobs, "off-campus" part-time jobs, and term-time internships) taken by students?

RQ2.4 Does the impact on early post-college labor market performance vary by the forms of job (work-study jobs, "off-campus" part-time jobs, and term-time internships) taken by students?

The third research question (RQ3) is aimed at understanding how term-time working influences students' academic and labor market performances. It explores students' experiences and opinions of working during college with the following sub-questions:

RQ3.1: What are the motives of students to work during the term-time?

RQ3.2: What gains and losses from term-time working do students relate to their academic performance?

RQ3.3: What gains and losses from term-time working do students relate to their labor market performance?

Overall, this study aims at exploring the current situation of term-time working in Chinese colleges and universities, its impacts on students' college outcomes, and potential explanations of how it influences students. The first two questions are answered with quantitative analysis. The third question is answered with qualitative analysis. The next sections present the theoretical framework, the mixed-method research design, and the data and sample for quantitative and qualitative analyses.

3.2 Theoretical framework

This section describes the theoretical framework that guides the investigation. A summary and discussion of theories that provide explanations on the impact of term-time working is presented, followed by a conceptual framework derived from the theories and empirical evidences.

3.2.1 Theoretical explanations on the impact of term-time working

There are two sets of theories that could be used to explain the impact of term-time working on college students. The first is the college impact theories, including the student involvement theory (Astin, 1984) and student engagement theories (Chickering, Gamson, & Poulsen, 1987; Kuh, 1995; Pascarella & Terenzini, 1991, 2005; Tinto, 1975). These theories suggest that the hours spend on academic studies determine students' academic achievements, and students' participation in extra-curricular activities influence their personal development. It can be implied from these theories that term-time working may influence students' educational achievement through two possible channels: time spent on studying, and level of engagement.

Another theory is the human capital theory (e.g. Becker, 1993; Mincer, 1974). Human capital refers to the knowledge, skills, and attitudes that enhance the productive capacity of individuals. The theory suggest that people gain human capital from schooling and work, and the amount of accumulated human capital determines their wage and income in the labor market. This theory implies that term-time working influences students' post-college labor market outcomes directly through its impact on the accumulation of working-related human capital, and indirectly through its impact on educational achievements that contribute to school-related human capital.

3.2.1.1 Motives of term-time working

Under the classical human capital theory (e.g. Becker, 1993; Mincer, 1974), people try to maximize their lifetime income in a two-period lifecycle where they attend school in the first period and work full time in the labor market in the second period. An individual's wage rate in the labor market is determined by her educational achievement and working experience. When attending school, the individual has to pay for tuitions and living expenses. In addition, as she has no income in school, she bears an opportunity cost of attending school in terms of foregone earnings. In this situation, a rational individual will stop schooling and enter the second period when the present value of the total benefit of attending school (i.e. the additional income gain from school-related human capital) equals the present value of the total costs of schooling (i.e. the price of schooling plus the opportunity cost). In other words, the individual can benefit from investment in schooling as long as the net present value of returns to the investment is not less than zero. If the individual can borrow freely in any period of her life, it would be optimal to take only one task in each period. Combining school and work in the first period would postpone the individual's graduation and reduce the number of years of full-time working. Because the individual's wage is partly determined by her educational achievement, her wage in the first period is presumably lower than the wage in the second period. Therefore extending the first period would result in a negative net present value.

This theoretical framework can be applied to explain college students' working decisions. It suggests two possible situations where students might choose to combine work and study in order to maximize their lifetime income. The first is when there is a credit constraint and the individual cannot borrow enough to pay for college. In this case, working during term time is the only way for the student to continue schooling; otherwise, she would have to dropout before finishing college. Even if doing so delays her graduation, she will benefit from it as long as the present value of the additional benefit from of increased schooling (i.e. the income premium for graduating from college) is greater than the net present value of the additional cost in terms of the additional tuitions and the forgone earnings during the additional college years.

The second situation in which students might choose to work is when they expect valuable human capital gains from term-time working. Scott-Clayton (2012) suggested that even in absence of a credit constraint, it might also be beneficial to combine school and work in college. She argued that, as pointed out by Ben-Porath (1967), human capital cannot be obtained at a constant marginal cost as assumed in the classical model;

instead, there is diminishing marginal returns to time devoted to schoolwork in a given period. Students become less productive as the time spent on study increases. In this case, spending some time on working might increase the total human capital obtained in a given period. Students would be better off as long as the future income benefit from the in-school working experience is greater than the additional cost in terms of delayed school-related human capital. In addition, if they can graduate on time, they would benefit more because working not only increases the level of human capital but also reduces the total cost of schooling.

Scott-Clayton (2012) suggested a model based on the human capital theory to capture students' term-time working decision. Assuming that both the school- and work-related human capital are gained at a diminishing rate, and that the rates of future income return to school- and work-related human capital are different, there would be an equilibrium point where the marginal benefit of spending one additional hour on term-time working equals the marginal benefit of spending that additional hour on studying. The marginal benefit of one additional hour on working includes the current income return to that additional hour which can be measured by current wage, and the present value of the future income return to work-related human capital gained from that additional hour. The later part is determined by the productivity of the additional hour, the rate of return to work-related human capital in the labor market, and the market and personal discount rate. Similarly, the marginal benefit of one additional hour on studying is determined by the amount of school-related human capital gained from that hour, the rate of return to school-related human capital in the labor market, and the market and personal discount rate. The equilibrium condition is presented in Equation 3.1 (Scott-Clayton, 2012):

$$w_1(a) + \beta\, r^w \,\frac{\partial g(h_w;\, a, Q^w)}{\partial h_w} = \beta\, r^s \,\frac{\partial f(h_s;\, a, Q^s)}{\partial h_s} \text{..................................} (3.1)$$

where h_s and h_s are the time spent on studying and working in college respectively, a is individual's innate ability, $w_1(a)$ represents the wage of term-time working which is determined by innate ability, r^s and r^w are the rates of return to school- and work-related human capital in the labor market respectively, Q^s and Q^w represent the quality of schooling and working experience respectively, *g()* and *f()* are the production functions of work- and school-related human capital, and β is the discount rate. The left-hand side of the equation represents the marginal benefit of term-time working and the right-hand side represents the marginal benefit of schooling. The production functions *g()* and *f()* are assumed to be increasing and concave in h_s and h_w respectively because of the diminishing rate of return (Scott-Clayton, 2012). The components of these functions indicate that the amount of human capital gains from schooling or term-time working is determined by the amount of time spent on that activity, individual's innate ability, as well as the quality of that activity.

Equation 3.1 suggests that students' term-time working decision is influenced by their innate ability, labor market conditions and job characteristics, and institutional characteristics. Individual student's innate ability and motivation determine their productivity of time spent in school and the workplace. Labor market conditions, such as the wage rate for college students, types and amount of jobs available to college students, rate of return to educational attainment, and rate of return to working experience, influence students' perceptions about the current and future benefit of working during college. Job characteristics, such as whether it is related to students' academic major and how much challenge they face at work, determine the quality of human capital gained from work. Finally, institutional characteristics such as the type, size, and academic environment determine the quality of education a student can get. Rational students take all of these factors into account when making decision on whether and how much to work during college.

3.2.1.2 Impact on educational achievement

According to the college impact theories, a student's achievement in college is determined by her college experience (Astin, 1984, 1993; Chickering et al., 1987; Kuh, 1995; Pascarella & Terenzini, 1991; Tinto, 1975). First of all, Astin's theory of student involvement suggests that one's achievement in a certain activity is determined by the physical and psychological energies devoted to it (Astin, 1984). Therefore students need to devote sufficient time and effort on studying to maintain a good academic record. Second, student engagement theories point out that frequent participation in out-of-class activities, such as formal and informal interactions with faculty members, cooperation with peer students, and participation in student organizations and clubs, can facilitate students' intellectual and personal development (Chickering et al., 1987; Kuh, 1995; Pascarella & Terenzini, 1991, 2005; Tinto, 1975). Third, through interactions with faculty and peers, students would be able to better integrate their personal goals and characteristics with the institution's social and academic systems (Tinto, 1987, 1993). According to the interactional college retention model established by Tinto (1987, 1993), students' level of academic and social integration influence their retention decisions to a large extent. Students with higher level of integration into the college are less likely to drop out before graduation.

These theories suggest some potential impacts of student term-time working. Working might require time and energy that could otherwise be spent on studying. In this case, term-time working would have a negative impact on students' academic performance. In addition, as working sometimes conflicts with class schedule, it might delay students' study progress and postpone their graduation. However, study time is not the only source of time for work. If working does not reduce the time available for study, it might not be detrimental for academic performance.

From this point, the intensity of work is an important factor influencing the impact of term-time working. The intensity refers to both the time and energy required by the job. Moderate level of work might allow students with sufficient study time. For instance, if a student works only a few hours per week, or if the job is not demanding and even allows free time to study at work (for instance, librarian, etc), it might not be difficult for the student to balance work and study. On the contrary, if the job is so demanding that the student has to sacrificing her study time or gets too exhausted to study after work, her academic performance will be harmed. Another important factor along the same vein is the flexibility of the job. If a student can easily adjust her work load and schedule, she would be able to minimize the conflict between work and school by working at free time and reducing hours when facing heavy class load.

Term-time working might also influence students' educational achievement is through its impact on engagement. In addition to study time, working might limits time and opportunities for participation in school activities. Fjortoft (1995) suggests that, as students spend more hours on working, they might become more committed to their role as employees than the role as students. In this case, they might be less willing to get engaged in school and academic activities (Fjortoft, 1995). According to the retention model modified by Riggert et.al (2006), as increasing levels of term-time working decrease the level of social integration of the student into the communities and subcultures of the institution, student employment have a “powerful impact on psychological satisfaction” which is “ultimately most determinative of the retention decision” (Riggert, Boyle, Petrosko, Ash, & Rude-Parkins, 2006, p.75). In this case, term-time working might increase the probability of dropout from college.

It can be implied from the student engagement theory that another factor that determines the impact of working on college persistence is job location. On-campus jobs such as research assistants, teaching assistants, and office assistants still provide students with opportunities to interact with faculty, staff, and peers. Therefore it is possible that taking such jobs does not hinder but enhances student engagement and integration into the institution. By contrast, students who work off-campus have few opportunities to participate in school activities, and therefore might have a low level of integration to the institution.

Term-time working might also facilitate students’ academic study in other ways. For instance, students who work in jobs that are related to their academic interests might become more commitment to the field as they get more involved at work. This serves as an incentive for them to study harder in school in order to learn further knowledge and skills (Fjortoft, 1995). Another possible benefit of term-time working is the development of time management skills. Better time management skill might lead to better academic performance because it increases students' efficiency (Britton & Tesser, 1991). In addition, students also develop cognitive and non-cognitive skills at work, such as critical thinking, problem solving, and interpersonal skills (Broughton & Otto, 1999; Dundes & Marx, 2006; Hammes & Haller, 1983; Kuh, 1995). The improvement in cognitive skills might facilitate students' learning and make them more efficiency, while development in non-cognitive skills might help students build up a better relationship with faculty and peers and therefore increase the levels of engagement.

The above discussion also suggests that students' innate ability and motivation might also influence the impact of term-time working. Those with higher ability and motivation might be better at balancing work and study than other, participate more frequently in school activities, and be more commitment to graduate. In this case, the impact of term-time working might be less negative for them than for other students.

In summary, available theories suggest that the impact of term-time working on students' educational achievement might be in either direction. It is also possible that the negative and positive impacts offset each other, and therefore term-time working makes no difference to students' educational achievement. Job intensity, content, location, flexibility of work schedule, as well as students' ability and motivation are all very important in determining whether the net impact is positive or negative.

3.2.1.3 Impact on post-college labor market success

The major channel for term-time working to influence students' post-college labor market performance is, as indicated by the human capital theory discussed in Section 2, through its impact on students' human capital accumulation. Term-time working directly increases work-related human capital, while indirectly influences school-related human capital through its impact on educational achievement.

The contribution of term-time working on work-related human capital gains can be explained within the framework of employability. The concept of employability is widely used in the U.K. and European studies on labor market policies. It can be generally defined as the capability to obtain and maintain employment (Hillage & Pollard, 1998). According to Hillage and Pollard (1998), the employability of individuals depends on their "employability assets" consisting of knowledge, skills, and attitudes, the way they deploy the assets, the way they present the assets to the employers, and the context where they seek work. McQuaid and Lindsay (2005) pointed out that the term "employability" should cover both the supply-side and demand-side factors in the labor market. They built a broader model of employability that contains three "interrelated components": 1) Individual Factors such as "employability skills and attributes" and "job seeking abilities and skills", 2) Personal Circumstances with regards to one's socioeconomic status, and 3) External Factors such as labor market demand and employment-related policies and public services (McQuaid & Lindsay, 2005, pp. 208–213). They further provided a detailed list of the employability skills and attributes, and categorized them into eight groups: essential attributes, personal competencies, basic transferable skills, key transferable skills, high level transferable skills, qualifications, work knowledge base, and labor market attachment.

Term-time working experience as an individual-level behavior, contributes to the "individual factors" in McQuaid & Lindsay's (2005) model or the "employability assets" in Hillage and Pollard's (1998) definition. Students not only gain general working experience, but also career-specified practical experiences and knowledge if their term-time job is relevant to their academic major and/or future career plan (the Knowledge assets). The also gain cognitive and non-cognitive skills from working, as discussed in the previous section (the Skills assets). In addition, they might also be able to cultivate the sense of responsibility and professional commitment through their jobs (the Attitudes assets). These gains help to increase their employability and competitiveness in the labor market after graduation. Furthermore, students may build up career network during term-time working, which may facilitate their job-seeking process.

The magnitude of the contribution would depend on the job content. Jobs that are relevant to students' academic and career plan, such as research assistantship and internship in relevant professions, would be more valuable than irrelevant low-skilled jobs such as service and retail jobs. Another related job characteristic is the level of challenge. Students can gain more from a challenging work than a regular work. The interactions with supervisors and co-workers are also important, especially for cognitive and non-cognitive development, just as the interactions with faculty and peers are important at school.

From the above discussion, it would seem that term-time working increases students' human capital and therefore has a positive impact on post-college labor market performance. However, it might not be true given the ambiguous impact of term-time working on educational achievement as discussed in pervious section. The direction of the net impact again depends on various job characteristics.

To sum up, the college impact theories and human capital theory suggest that term-time working influences students' educational achievement and post-college labor market performance in a rather complex way. The impacts are influenced by job characters including intensity, content, location, and flexibility of work schedule, and by students' characteristics such as ability and motivations.

3.2.2 Conceptual framework

The conceptual framework of this study is constructed from a synthesis of the theories and empirical studies reviewed so far. As presented in Figure 3.1 below, this framework simulates a student's college life. It follows a production flow that contains three parts: inputs, process, and products.

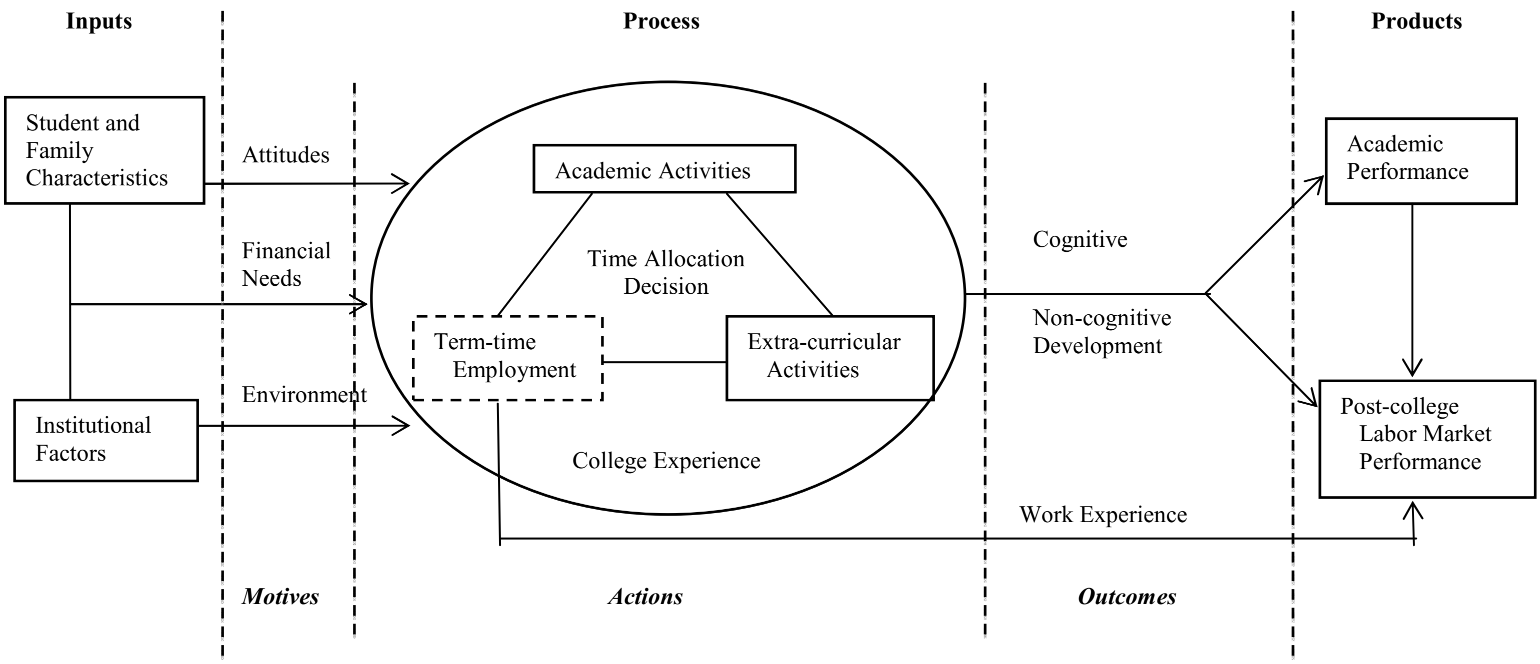

Figure 3.1 Conceptual framework

The left part, "Inputs", represents what the student bring into her college life (student and family characteristics) and what the institution provides to the student (institutional factors). Together, the "inputs" provide the background or context for the student's college experience.

The central part, "Process", refers to what student does in college. The boxes in the circle represent three types of activities in which students might be involved in college: academic-related activities, extra-curricular activities, and term-time employment. As students have limited time and energy, they have to decide how much time to spend on each type of activities. Term-time employment is in a box with dashed line, indicating that this is not an essential component of college experience. Students can choose whether to involve in work while attending college.

The right part, "Products", refers to the direct and long-term outcomes of attending college: educational outcomes (as represented by academic performance here) and post-college labor market performance.

The arrows in the framework indicates the flow: student, family, and institution characteristics ("inputs") influence student's time allocation decisions and college experience ("process") which in turn determine student's educational and labor market performances ("products"). The arrows are informed by the college impact theories, human capital theories, and empirical studies.

Students' characteristics such as ability, motivation, and attitudes are very important to their time allocation decisions (e.g. Warren, 2002). Rational students take actions based on their ability to fulfill their purposes. For instance, a student may decide not to work during college because she believes that she cannot manage it. Another student who believes that working experience is more important than academic performance in job hunting may intentionally choose to work during college (Fjortoft, 1995). Institutional factors may also be influential to students' decisions, as studies found that students in supportive environments tend to have a higher level of engagement with the institution (e.g. A. W. Chickering & Gamson, 1999; Kuh, 2001; Riggert et al.,2006). In addition, a student's family background and the institution she attends jointly determine the student's financial needs when attending college, which influences her decision on whether to work during college (Ehrenberg & Sherman, 1987; Hotz et al., 1999; Kalenkoski & Pabilonia, 2008; Scott-Clayton, 2012; Titus, 2010). These influential factors of students' decision on term-time working are supported by many Chinese survey studies, which found that the primary reason for Chinese college students to work is to gain working and social experience, followed by the reason of earning tuition and spending money.

Students' time allocation in college influences their college experience and outcomes. According to Astin's student involvement theory (Astin, 1984), time and effort devoted to academic activities, such as taking classes, studying for courses, and attending lectures, contribute to students' academic performance. Student engagement theories (A. Chickering et al., 1987; Kuh, 1995; Pascarella & Terenzini, 1991, 2005; Tinto, 1975) suggest that, students' participation in extracurricular activities, such as formal and informal interactions with faculty and peers outside classrooms, taking leadership positions in student organizations, and participation in other extra-curricular social activities, increases the level of engagement and integration to the institution and contributes to the development of cognitive skills (such as reading, writing, and analyzing abilities and critical thinking) and non-cognitive skills (such as time-management skills, interpersonal skills, and leadership). These are the two major types of activities that most college students would involve in. Term-time working is an option to students. If they decide to work during college, they would get monetary compensations and gain working experience as well as cognitive and non-cognitive skills. However, as working takes time away from school activities, working students may suffer some losses in academic performance.

Finally, according to the human capital theory (e.g. Becker, 1993; Mincer, 1974), students' educational achievement and working experience accumulated during college together determines their post-college labor market performance. These theoretical predictions are supported by empirical studies as summarized in the literature review section.

This framework guides the inquiry in this study. The first research question deals with the input characteristics of students who do term-time work. The second research question aims at examining the relationship between the "inputs" and the "outputs", while the third research question aims at understanding the "process" with a special focus on the role of term-time working in this process.

3.3 Research methodology

The whole inquiry is conducted under a sequential explanatory mixed method framework. This section describes the overall design and methods and data used in the quantitative and qualitative analyses.

3.3.1 Sequential explanatory mixed method design

As stated in the introduction section, the purpose of this study is to understand whether and how term-time working influences students' academic and early post-college labor market performances. This calls for the use of a mixed method design in the study, because a mono-method study in either the quantitative or qualitative paradigm answers only part of the question. Mixed method design is typically used to achieve several goals, some among which are, as summarized by Bryman (2006), “explanation” which is to use “one (method)… to help explain findings generated by the other”, “completeness which is to gain a “more comprehensive account of the area of enquiry”, and “utility” which is to make the findings “more useful to practitioners and others” (Bryman, 2006). These are the three purposes for this study to use the mixed method design: to use the qualitative findings to help interpret the quantitative findings, to gain an in-depth understanding of the impact of term-time working, and to provide evidence for decision makers and policy makers in higher education institutions to better support working college students.

Specifically, the study employs a sequential explanatory mixed method design as specified by Creswell et.al (2003), which “is characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data” with the priority “typically given to the quantitative data” (Creswell, Clark, Gutmann, & Hanson, 2003, p. 178). This is a typical design when the purpose is “to use qualitative results to assist in explaining and interpreting the findings of a primarily quantitative study (Creswell et al., 2003, p. 178)”.

The first two research questions of this study are answered with quantitative data and methods: descriptive statistics are used to document the trend and current situation of term-time working among college students; and regression analysis with a nationally representative dataset is used to ascertain whether and to what extent term-time working influences students’ academic and early post-college labor market performances. The third research question, students’ explanation on the impact of term-time working, is explored with qualitative data and methods. The quantitative and qualitative analysis are integrated in the interpretation stage, in a way that the qualitative findings helps to interpret the results of the quantitative analysis, and the quantitative data helps to test patterns found in the qualitative analysis. The whole study follows the standard procedure of sequential explanatory mixed method design as specified in Creswell et.al (2003) and demonstrated in Figure 3.2:

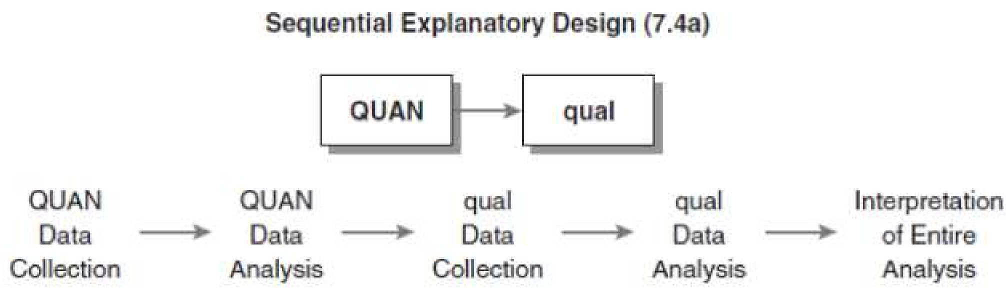

Figure 3.2 Procedure of sequential explanatory design

(Source: Figure 7.4a in Creswell et.al, 2003)

Figure 3.3 shows a diagram of the design for study. The rest of this section provides a detailed discussion of the designs of the quantitative and qualitative inquiry respectively.

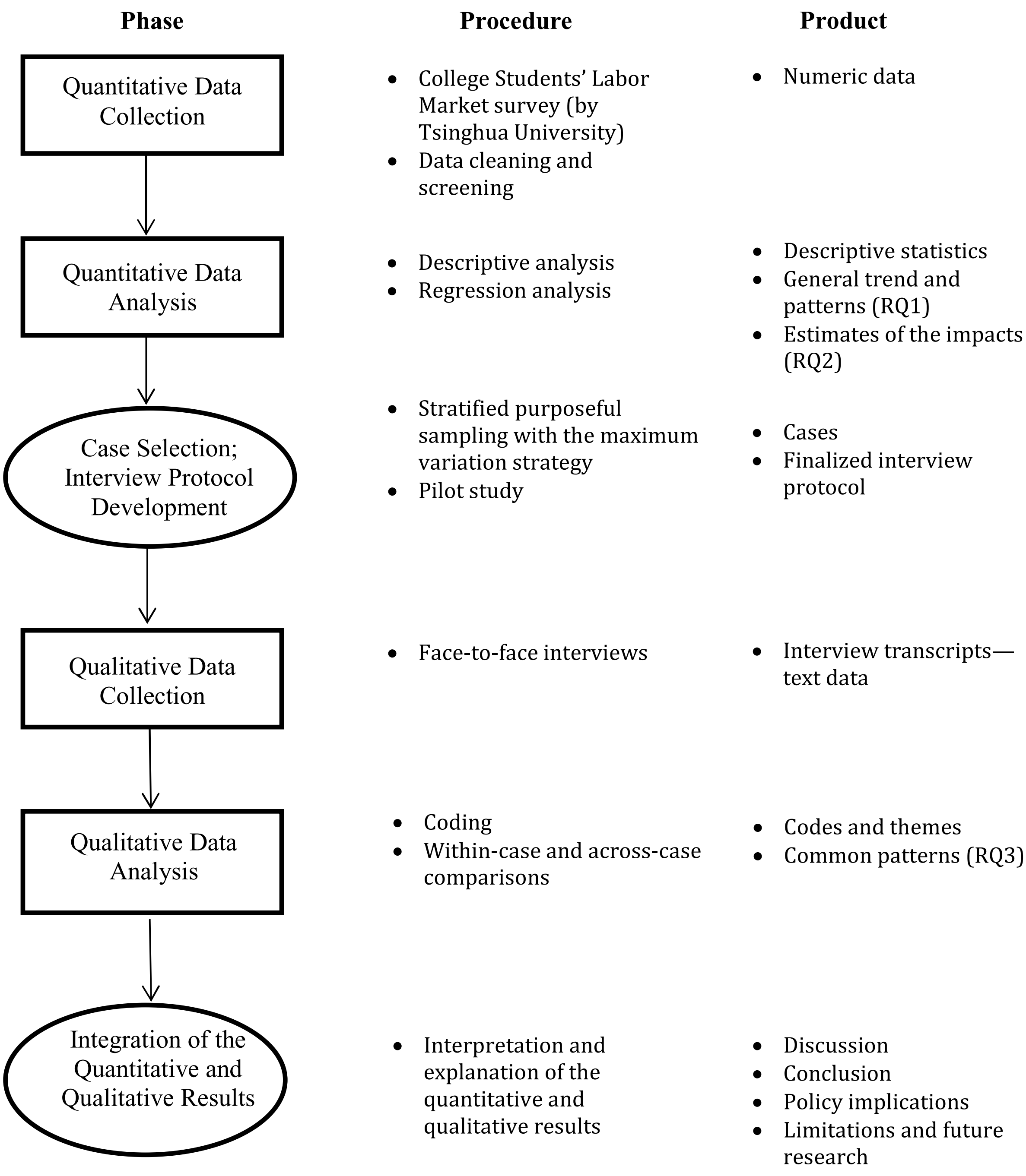

Figure 3.3 Diagram of research process

3.3.2 Methodology for quantitative inquiry

The quantitative inquiry in this study answers the first two research questions stated in Section 3.1. Descriptive methods are used to explore the current situation of in-college and term-time working. Regression analysis is used to estimate the impact of term-time working. Quasi-experimental strategies are used to address the endogeneity problems when estimating the impacts. The rest of this section will first present the regression models to answer RQ2, and then discuss the threats to the internal validity of the estimates and strategies to address these challenges.

3.3.2.1 Model specification

The quantitative analysis uses three regression models to estimate the impact of term-time working on college students' academic performance (A_i), initial post-college employment status (Emp_i), and starting salary ($Salary_i$).

The regression equation to estimate the impact of term-time working on academic performance is:

$$A_i = \alpha_0 + \alpha_1 W_i + \alpha_2 X_i + \varepsilon_i \text{ .... (3.2)}$$

where A_i is a measure of academic performance, W_i is a measure of term-time working, and X_i is a set of covariates including individual characteristics, family background, college experience, and institutional characteristics. The estimated coefficient of W_i, i.e. α_1, shows the impact of term-time working on the academic performance.

Academic performance (A_i) is measured by the average course score over the college years. In Chinese colleges and universities, final course scores are given in a 100-point scale grading system and are available to students on student transcript.

Though the average score of all courses may not be presented on transcript, it is easy to calculate and is usually announced to students in the Comprehensive Quality Assessment.[7] U.S. empirical studies usually measure academic performance with GPA. However, GPA is not a proper measure in the context of China. It is a newly introduced grading system in Chinese colleges and universities. The calculation criteria and grading scale are not consistent across institutions. Though most institutions use a 4-point scale system, some use a 5-point scale. Therefore average course score in college is used instead of GPA in this study.

The key explanatory variable term-time working (W_i) is measured with three variables: 1) a binary measure of whether the student worked during term time, 2) months worked during term time, and 3) hours worked per week during term time. The binary measure distinguishes working students and non-working students; months worked during term time measures the lengths of term-time working experience; and hours worked per week during term time measures work intensity. These variables are used in Equation 3.2 separately. In the equation with hours worked per week, a quadric form of hours worked is also included, as the U.S. empirical studies suggest that the relationship between job intensity and GPA might be non-linear (Gleason, 1993; Hood et al., 1992; McCormick et al., 2010; Moore & Rago, 2009; Pascarella et al., 1998; Pike et al., 2008). In addition, variables describing the participation, length, and intensity of each form of

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[7] Comprehensive Quality Assessment ( ) is an assessment system of "All-around Education employed by most universities and colleges in China. Though detailed criteria may be different across institutions, the system usually considers both academic performance and performance in extra-curricular activity. The assessment is usually taken every semester or academic year. The score and ranking in this assessment is usually used in competition for merit-based scholarships and awards.

term-time job, i.e. work-study jobs, part-time jobs, and internships, are included in the models in order to estimate the impact of different forms of job.

The impacts of term-time working on initial employment status and initial salary are estimated with Equation (3.3) and (3.4) respectively:

$$Emp_i = \beta_0 + \beta_1 W_i + \beta_2 S_i + \beta_3 X_i + \theta_i \qquad (3.3)$$

$$log(Salary_i) = \gamma_0 + \gamma_1 W_i + \gamma_2 W_i^2 + \gamma_3 S_i + \gamma_4 X_i + \mu_i \qquad (3.4)$$

The dependent variable in Equation (3.3), Emp_i, is a binary variable indicating whether the student has at least one job offer just before graduation. The model is estimated with probit regression. Equation (3.4) is a Mincer-type wage equation following empirical U.S. studies (Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005), where the dependent variable, $log(Salary_i)$, is the log form of starting monthly salary. In both equations, W_i is a measure of term-time working experience, S_i is schooling attainment, and X_i is a set of covariates. The coefficient of W_i, i.e. β_1 in Equation (3.3) and γ_2 and γ_3 in Equation (3.4) represent the impact of term-time working on whether been offered a job before graduation and the impact on initial salary respectively. γ_2 and γ_3 can also be considered as the income return to working experience gained during college.

In the U.S. empirical studies on the impact of in-schooling working on post-college income, in-school working experience (W_i) is usually measured by years worked during school (Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005). However, this is not an appropriate measure for work experience gained in college for two reasons. First, the variable will have only a few values, as the typical length of college is four to five years. Second, students may work only for several months in a year. It is not proper to count a student who worked for only two months in a year as having one year of work experience. Doing so diminishes the potential large variation in work experience gained through college. Out of these concerns, this study uses months worked during college as a measure of in-school work experience. As the study focuses on the impact of term-time working, the key explanatory variable is total months worked during term time, while controlling for the total months worked during vacations. In addition, in order to account for the variation in hours worked per week during term time, a constructed variable, total days of term-time working, is used as an alternative measure of term-time working experience.

Schooling attainment (S_i) in Equation (3.3) and Equation (3.4) is usually measured by years of schooling in U.S. empirical studies (Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005). However, in this study, all subjects in the sample are college senior students who have the same number of years of schooling. Therefore it is not appropriate to use years of schooling here. A study by Titus (2010) which estimated the impact of term-time working on initial salary used whether completed a degree after 6 years of entering college and academic performance during college as measures of schooling, though he did not estimate the Mincer equation. For the case in China, degree completion in 6 years is not a proper measure, as most college students are able to graduate with a degree in four years. Chinese studies exploring the determinants of the initial salary of college graduates usually use measures of academic performance such as academic ranking, whether had an excellence academic record, whether obtained any scholarship, and whether obtained College English Test (CET) certificates (e.g. Du & Yue, 2010; C. Guo, Tsang, & Ding, 2010; F. Li, Chen, & Chen, 2010; Xie & Li, 2010;

Yan & Mao, 2008; Yue et al., 2004).[8] Following these studies, the study here uses average score, academic ranking, whether had merit-aid, and whether obtained CET certificates to measure educational attainment.

The covariates set (X_i) in the three models are almost the same. In general, it includes individual characteristics, family background, college experience, and institutional characteristics. Individual characteristics include age, gender, race, NCEE score, academic track in high school, and whether was a student leader in high school. NCEE score is used as a measure of academic ability in many studies, as the exam is designed to sort students into different levels of higher education institutions (C. Guo et al., 2010; H. Li et al., 2012). Student's academic track in high school is included in order to control for systematic difference in NCEE scores across tracks. There are at least two origins of such difference. First, students in the humanity track and science track use different versions of exam papers in NCEE. Humanity-track students on average have lower NCEE score than science-track students. Second, art and athlete students have bonus scores in college admission. They in general have lower NCEE score than other students. In addition, dummies indicating the province where the student is from are included to control for systematic difference in NCEE scores across provinces. Such difference may come from two aspects. First, provinces in different regions have different versions of exam papers. Second, the college admission is conducted at the

[8] The College English Test (CET) is a standardized English ability test given at the national level. Most institutions require undergraduate students to take the Level 4 test (CET-4) before graduation.

provincial level and in some provinces the competition is more severe than in other provinces.

Whether the student was a student leader in high school is included to control for non-cognitive abilities. As suggested by the literature, student leaders in high school present different characteristics from non-leaders in non-academic aspects, for instance better inter-personal skills and problem solving skills, more extroversive personality, and more positive motivation and attitude about future (Amit, Popper, Gal, Mamane-Levy, & Lisak, 2009; Gottfried et al., 2011; Jucai Li & Lang, 2012; Lu, 2008; Schneider & Paul, 1999). These are the factors that may influence students' development in and after college but are hard to measure. Including the dummy variable, "Whether was a students leader in high school", is expected to be able to control for some of the pre-college variance in these non-academic aspects. This set of individual characteristics is included in all of the three models.

Family background includes whether the student has a rural "Hukou" (i.e. registration of residency), province where the student is from, whether the student is the only child in one's family, and a constructed socio-economic status index (SES). The dummy variable of rural "Hukou" and dummies for hometown are used to control for regional differences in economic background and access to educational resources. In general, students with rural "Hukou" and students from the central and west provinces have less educational resources than students with urban "Hukou". Whether the student is the only child in one's family is a measure of family structure. Those who are the only child in their family usually receive more support from the family than those who have siblings. Socio-economic status index is constructed based on annual household income, type and area of resident dwelling, parents' years of schooling, and parents' occupations. Details about the construction of this index are explained in Section 3.5.1.2. The family background characteristics are included in all three models.

College experience consists of academic related experience and extra-curricular experience in college. Academic related experience includes academic major, whether has an academic minor, the degree of preference towards one's major, hours spent per week on studying after class, and English proficiency. Academic major is an important predictor of labor market outcomes because it determines people's occupation and industry in the labor market. It is also relevant to the average score in college in a way that some majors may be more challenging than others and therefore students with those majors would in general have a relatively low average score in college. Whether the student has an academic minor is also relevant to both academic and labor market performance. On one hand, it increases course load in college and therefore may result in a relatively low average score; on the other hand, it may improve one's competitiveness in the labor market (Du & Yue, 2010). The preference degree towards one's major is an ordinal variable indicating self-reported degree to which a student likes his or her major, with 1 being "Don't like at all" to 4 being "like it very much". It is a measure of students' attitude and motivation. The hypothesis is that students with higher degree of preference of their major are more motivated and therefore may have better academic and labor market performance. The above three variables are included in all three models. Besides that, hours spent per week on studying after class is included in the model for academic performance as a measure of commitment towards studying. English proficiency is included in the models for labor market performance because it is one of the common credentials required by employers. It is measured by whether the student passed the Level 4 and/or Level 6 in the CET test. The variable is not included in the model for academic performance because it in itself is a measure of educational achievement.

Extra-curricular experience is captured by whether is a member of the China Communist Party (CCP), whether was a leader in departmental or institutional student organizations, and whether has professional certificates. These variables, including performance in CET tests, are common covariates included in previous studies on post-college labor market performance in China (Du & Yue, 2010; C. Guo et al., 2010; Lai et al., 2012; H. Li et al., 2012; Xie & Li, 2010; Yan & Mao, 2008; Yue et al., 2004). CCP membership and whether the student was a leader in student organizations are also included in the model for academic performance because these experiences may take away time and energy from studying. In addition, type of financial aid is also included in all three models, as it may influence students' incentive of studying and post-college job decisions (Yang, 2011).

Finally, institutional characteristics include academic ranking level of the institution, academic concentration of the institution, region of the institution, and campus location of the institution. Academic ranking level of institutions refers to elite university/college, non-key university/college, and independent institution. Institutions in different levels have different source and amount of educational resources, and therefore provide different level of quality of education. Academic concentration of an institution is a three-category variable indicating whether the institution is a comprehensive institution, a science and engineering concentrated institution, or an institution with other concentrations. Comprehensive institutions and science and engineering concentrated institutions are the two largest groups among all the categories. Institutions with different concentration may have different institutional level characteristics, for instance, composition of students, overall climate, and aim and purpose of education. These factors may influence students' college experience and outcomes.

In addition to above covariates, another set of variables measuring labor market condition is included in the models for labor market outcomes. One common indicator of the market demand of labor supply is the local unemployment rate. However, this analysis does not include unemployment rate for three reasons. First, the local unemployment rates reported by local governments are subject to measurement error. Local governments have a tendency to underestimate the unemployment rate. Second, the local unemployment rate reported before the year of 2011 in China is the registered unemployment rate, which is defined by the ratio between registered unemployed population in urban and suburban area and the total labor force in urban and suburban area. It is criticized by labor economists and statisticians in China for not being able to represent the real unemployment rate (Wan, 2009; Xiong & Yu, 2004; Zeng & Yu, 2006; J. Zhang, 2003). Therefore it may not be a proper measure of labor market conditions. Third, the unemployment rate is measured for the whole labor force. Even if it were reliable and credible, it might not reflect job opportunities for college graduates, as unemployed people are more likely to have lower level of education.

Instead of using local unemployment rate, dummy variables of the region where the institution located and the location of the campus are included to control for labor market demand or job opportunities for college graduates. The region of institution is a categorical variable representing five regions in China: Municipalities (Beijing, Tianjin, and Shanghai), East region, Northeast region, Central region, and West region. The east and northeast regions are better developed in general than the central and west area and therefore have more and better job opportunities. The three municipalities are cities directly governed by the central government. Though located in the east region, they are listed as a separate category because there are more educational resources and job opportunities in these cities than in other places. The fourth municipality under the central government, Chongqing, is not included in this category, because it locates in the central west part and has the shortest history of being a municipality and therefore fewer resources compared to the other three municipalities.[9]

Campus location is a categorical variable indicating whether the student studies in a campus in the urban area of large cities, in both urban and suburban area of large cities, in the suburban area of large cities, or in a small city. Here large or small city is determined by the administrative level and population of the city.[10] Small cities refer to cities at the prefecture level or below and have a population less than two million. Institutions in these cities are all located in urban area; however, as the cities are small, there may be fewer job opportunities for college graduates. As for institutions in large cities, many of them have built up new campuses in suburban area since the expansion of higher education in China. Some institutions place all undergraduate students in the

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[9] Another reason to use this 5-category region variable is that these categories were used as one of the criteria to select participating institutions in the data collection process. More details about data collection are presented in Section 3.5.1.

[10] Cities in China are grouped into four administrative levels: municipalities directly under the central government, vice-provincial cities, prefecture-level cities, and county-level cities. Cities in the first two categories have larger population and land area and are more developed than cities in the last two categories. The categorization and population of cities are from the 2012 China City Statistical Yearbook.

suburban campus throughout college years, some place first- and second-year students in suburban campus and senior students in urban campus, and some allocate students in urban and suburban campus based on academic department. The cost of job searching may be higher for students in suburban campuses and in urban campuses.

In the model for starting salary, the industry for the job and the province where the job is located are also added as covariates to control for wage differences between industries and provinces (Titus, 2010). In addition, whether the student worked in a province other than where the institution located is included to control for the self-selection of higher salary. The employer's type is also controlled in the wage equation because different types of employers provide different level of pecuniary and non-pecuniary benefits. The types include governments and social organizations, public institutes, state- or public-owned firms, foreign- or co-owned firms, private-owned firms, and self-initiated firms.

Table 3.1 below summaries the definitions and measures of the variables to be included in the models.

Table 3.1 Definition and measure of key variables

Variable name	Definition	Measure/comments
Dependent variables		
avescore	Average score over the four years in college;	Continuous, 0~100;
emp	Initial employment status: whether obtained a job offer by the time of the survey;	Dummy, 1=obtained an offer, 0=did not obtained an offer;
salary	Initial salary offered if a job is offered.	Continuous; the log form is used.
Key independent variables:		
worked, termtime, offterm	Whether the student ever worked in college, during term time, and during vacations;	Dummies: 1=yes, 0=no;
jobform, ttjobform, offjobform	Forms of jobs that ever been taken during college, term time and vacations;	Categorical variables: 1=work-study, 2= part-time, 3=internship, 4=work-study and part-time, 5=work-study and internship, 6=part-time and internship, 7= all three forms;
totaldr, ttdr, offdr	Total months worked in college, term time,	Continuous;

	and vacations (measures of working experiences);	
avehr, tthr, offhr	Hours worked per week in college, term time, and vacations (measures of working intensity)	Continuous;
Variable name	**Definition**	**Measure/comments**
totalday, ttday, offday	Constructed total days worked in college, term time, and vacations (alternative measures of working experiences);	Continuous, constructed with total months worked and hours worked per week (see Section 3.5.1.2 Variable construction);
	Key covariates:	
Individual characteristics		
age	Age of the student in 2011;	Continuous;
female	Gender of the student;	Dummy: 1=female, 0=male;
minority	Whether the student is from a minority ethnicity group;	Dummy: 1=minority, 0=Han;
NCEE	National College Entrance Examination score (measure of academic ability);	Continuous, rescaled to 0~100;
track	Academic track in high school;	Categorical: 1=liberal arts, 2=sciences, 3=comprehensive, 4=arts, 5=athlete.
seniorleader	Whether was a student leader in high school (measure of non-academic ability).	Dummy: 1=yes, 0=no.
Family background		
resregion	Region of student's residency before college;	Categorical: 1=Municipalities, 2=East area, 3=Northeast area, 4=Central area, 5=West area;
resprov	Province of student's residency before college;	Categorical;
rural	Whether the student has a rural or urban "Hukou";	Dummy: 1=rural, 0=urban
singlechild	Whether the student is the only child in their family;	Dummy: 1=single child, 0=has siblings
SES	Constructed index of the socio-economic status of the student's family;	Continuous: composite score based on parents' years of schooling, parents' occupations, annual household income, and family wealth measured by real asset (see Section 3.5.1.2 Variable construction);
College activities		
major	Academic major;	Categorical: 1=liberal arts, 2=social science, 3=science and technology engineering, 4=economics and business, 5=other majors;
likemajor	Whether the student liked his/her major;	Ordered categorical: 1=not at all, 2=a little bit, 3=somewhat, 4=very much;
hasminor	Whether the student had a minor;	Dummy: 1=yes, 0=no;
English	English proficiency measured by whether the student passed CET-4 and CET-6 tests;	Categorical: 1=not passed CET4, 2=passed CET4, 3=passed CET6;
reviewtime	Hours spent per week on studying after class;	Continuous;
meritaid, needaid	Whether had merit-aid, whether had need-aid;	Dummy: 1=yes, 0=no;
Partymember	Whether the student is a CCP member;	Dummy: 1=yes, 0=no;

stleader	Whether the student was a leader in departmental or institutional student organizations (a measure of involvement in extra-curricular activities).	Dummy: 1=yes, 0=no;
certificate	Whether has professional certificates	Dummy: 1=yes, 0=no.
Institutional characteristics		
instlevel	Whether the institution is a 985, 211, or provincial university/college;	Ordinal: 0=provincial, 1=211 but not 985 university, 2=985 university;
instcon	Concentration of the institution;	Categorical: 1=comprehensive institution; 2=engineering and science concentrated institution; 3=other institution
instregion	Region of student's residency before college;	Categorical: 1=Municipalities, 2=East area, 3=Northeast area, 4=Central area, 5=West area;
instprov	Province where the institution located.	Categorical;
instloc	Campus location of the institution.	Categorical: 1=urban, 2=suburban, 3=urban & suburban, 4=small-scale city.
Labor market characteristics		
industry	The industry in which the student would work after graduation	Categorical;
emptype	Type of the employer	Categorical
workprov	The province where the student would work after graduation	Categorical;
migwork	Whether the student would migrate to another province to work.	Dummy: 1=yes, 0=no.

3.3.2.2 Identification challenges

The internal validity of the estimates of α_1, β_1, γ_1, *and* γ_2 is subjected to the threat of selection bias. For the OLS estimates of these coefficients to have causal interpretations, a core assumption is that the selection into the treated group is independent of potential outcomes after controlling for covariates. This is called selection on observables or Conditional Independence Assumption (CIA) (Angrist & Pischke, 2009, p. 53). In other words, the treatment status should be "as good as randomly assigned" conditional on the observables (Angrist & Pischke, 2009, p. 55). However, the "treatment" in this case, i.e. working while enrolled in college, is not randomly assigned to students. Instead, it is endogenous to students' decision. Students "selected" themselves into the treatment (i.e. working) and control (i.e. nonworking) groups.

As discussed in Section 3.3.1.1, students' decision on term-time working is influenced by many factors. Some of these factors, such as individual's ability and motivation, might also influence students' educational achievement and post-college labor market performance. It is possible that, for instance, highly able and motivated students might choose to work because they know they can balance work and school. In this case, working might not influence their academic performance. Therefore comparing this group of students to non-working students would upward bias the estimated impact of term-time working on academic performance. In addition, students with higher ability are more likely to get a good job than less able students, regardless whether they worked or not during college. In this case, the estimate of the impact on post-college performance would be upward biased.

In addition, students are able to adjust their working behavior based on their perception of their course load and the possible impact of working. For instance, they can choose to work more hours when they just have a few courses and reduce the hours when the course load becomes heavier or when they find that their grades start to suffer. In these situations, students are positively self-selected into working status. OLS estimators will underestimate the negative impact of working on academic achievement, as those on whom the impact is the most negative might have stopped working. It also reflects a reversed causal relationship that academic performance is not a result but a cause for different working behaviors.

Students' attitude towards work and study might also alter the interpretation of the relationship between term-time working and educational achievement. As suggested by Warren's primary psychological orientation theory, a student might turn to work as an alternative source of self-fulfillment if she is not able to do well in school. In this case, the poor academic performance is the reason of term-time working, rather than the result of it. Another possible situation is that students choose to work simply because they do not like school. In this case, their poor academic performance should be attributed to their resistance to school work rather than their working behaviors—they might not perform well even if they do not work. Students who prefer work to school are also more likely to drop out. If this psychological preference is not controlled for, the impact of term-time working on dropout will be overestimated.

Institutional placement of term-time job positions is another potential source of bias in the estimation of the impact of term-time working, especially for the impact of work-study jobs. As the work-study jobs are provided at the institution level, the institution is able to select students into different positions and control the working intensity of individual students. If students with higher ability are assigned to more advanced jobs and allowed more working hours during term-time working, the impact of term-time work-study jobs on academic performance and labor market outcomes might be upward biased, as these students would be able to perform well both in academic and in labor market no matter whether or not they work in term time. The same selection bias may exist for internships as well, as institutions sometimes can recommend students into different internship positions. If institution's recommendation is based on students' ability, the estimation of the impact of internships might be upward biased.

To sum up, term-time working status is endogeneous to students' college outcomes in some unobservable ways. Controlling only for observables violates the CIA assumption and biases the estimates of the causal impact.

3.3.2.3 Identification strategies

This study addresses the endogeneity problem with two quasi-experimental strategies. The basic idea is to construct a comparable control group (i.e. non-working students) which is similar to the treatment group (i.e. working students) in every observed aspect except the treatment status (term-time working status). The two strategies are Instrumental Variable (IV) design and Propensity Score Matching (PSM). The Fixed Effect (FE) strategy used in some previous studies in the U.S. is not proper for this study because the data used here is not longitudinal. The rest of this section will discuss the identification strategies in details.

<u>Instrumental variable</u>

Instrumental variable (IV) design is a common strategy used by previous studies (Dadgar, 2012; DeSimone, 2008; Kalenkoski & Pabilonia, 2008; Light, 2001; Scott-Clayton, 2011; Stinebrickner et al., 2003; Titus, 2010). The standard procedure of using instrumental variables is to conduct a two-stage-least-square (2SLS) estimation: first predict the treatment status of each individual with the instrumental variable (IV_i) (Equation 3.5) and then estimate the outcome function (Equation 3.6) using the predicted treatment status ($\widehat{D_i}$) instead of the actual status:

$$D_i = \nu_0 + \nu_1 IV_i + \nu_2 X_i + \varsigma_i \quad (3.5)$$

$$Y_i = \omega_0 + \omega_1 \widehat{D_i} + \omega_2 X_i + \zeta_i \quad (3.6)$$

where X_i is a set of covariates.

For ω_1 in Equation (3.6) to be a consistent estimate of the causal impact of the treatment under this framework, three key assumptions must be met: first, the instrumental variable must have a clear effect on the treatment status (the correlation requirement); second, the instrumental variable is independent of both the potential outcomes and potential treatment assignment after controlling for covariates (the independence assumption); and third, the only channel for the instrumental variable to influence the outcomes is mediated through the first stage (the exclusion restriction) (Angrist & Pischke, 2009, p.117,152–153). As for the case of estimating the impact of term-time working on students' academic and/or labor market achievements, a valid instrumental variable for term-time working should be directly correlated with the hours worked while enrolled, but independent from students' term-time working decision and potential academic and/or labor market achievements given the decision, and should have no other channel to influence students' outcomes besides through its impact on the hours worked.

The instrumental variable used in this study is the percentage of term-time working students in the institution. This is a measure of the institutional climate of working during term time. The assumption is that if there is a common trend of working during term time in the institution a student attends, he or she is very likely to work. Such a peer effect does exists, as previous survey studies find that some students work just because their friends work (S. Jing et al., 2005; S. Wang, 2010). A potential problem is the peer effect in other aspects. For instance, attending an institution with a large percentage of working students may change a student's attitude towards study and work. He or she may emphasize less on academic performance and therefore voluntarily reduce time and effort on studying even if not working. In this case, attending such an institution influences students' grade in at least two ways by increasing term-time working hours and by reducing the emphasis on academic performance. The exclusion restriction is violated. To address this problem, a measure of institution quality will be added to the model in order to control for institutional level impacts. There is also a threat to the independence condition if students are able to learn about the climate of working in different institutions before they enter college and take it into account when they choose the college. In this case, the IV would be endogenous. These potential threats will be discussed and addressed in later chapters when presenting the empirical results. In addition, it needs to be point out that this instrumental variable cannot control for the bias induced by the institutional selection of students into different positions, as the variation is at the institutional level. It only addresses the endogeneity issue raised by students' motivation of term-time working. The IV estimates only captures the impact on students whose working status is influenced by the institutional trend of term-time working.

Propensity score matching

Propensity Score Matching (PSM) strategy provides a way to construct a comparable comparison group with available covariates. There are two stages to implement this strategy: first estimate a propensity score, i.e. the probability of being in the treatment group, conditional on covariates for each individual in the sample, and then match up pairs who have similar values of propensity score but different treatment status. Specifically, the first stage estimates the following model:

$$p_i=P(D_i=1/X_i)= \delta_0 + \delta_1 X_i + \eta_i \quad \text{.......................................}(3.7)$$

where p_i is the propensity score of working during term time, D_i is the participation status which takes the value 1 when student i worked during term time and 0 when did not, X_i are covariates that influence the probability of working during term time. Then working and non-working students are matched up based on the propensity score. Different model specifications and matching algorithms such as nearest neighbor matching, within calipers matching, and Kernel matching procedure are tried to get the best matched sample. After finishing the matching process, covariates adjusted regressions are performed for the matched groups to estimate the impact of term time working on outcomes. As the matched control group is selected with replacement, it is possible that a control group member serves as the match for more than one treatment group members and the size of the control group is smaller than the treated group. In this case, individuals in the reduced sample may not be independent. Therefore a weight equal to the number of times each individual appears in a matched pair is used to adjust the standard error of the estimation.

There are two assumptions for the PSM estimate to be unbiased. The first is the CIA assumption that requires the treatment status not be correlated to the potential outcomes in any unobserved way. A balance check on covariates is done after matching to verify that the matched treated and control groups are comparable. The second assumption is the common support condition that the value of p_i is bounded between zero and one because no comparable group can be found for individuals whose probability of being treated given the set of covariates is 0 (will never be treated) or 1 (will always be treated) (Hirono & Imbens, 2001). A check of overlap is preform to make sure the groups have common support.

3.3.3 Methodology for qualitative inquiry

The qualitative analysis answers the third research question in this study. A multiple-case study approach is used to analyze data from student interviews. This section describes the overall approach, design of the interview protocol, and the analytical strategy. The data collection process and the sample are described in Section 3.4.2.

3.3.3.1 Approach: multiple-case case study

The purpose of the qualitative inquiry in this study is to understand students' term-time working experience in order to help interpret the quantitative estimates on the causal impact of term-time working. A case study approach serves this purpose. As Yin (2008) suggests, using case study approach is desirable when the purpose of study is to develop an in-depth understanding of a contemporary phenomenon in a real-world setting (Yin, 2008, pp. 8–10). He also suggests that an important application of case study is to "explain the presumed causal links in real-life interventions" (Yin, 2008, pp.19) and it is common for quantitative analysis with a large sample to use case studies to "illustrate, in great depth, the experience of individuals" (Yin, 2008, p. 174). Following these suggestions, this study uses a case study approach, and more specifically a multiple-case case study design to explore potential explanations on the impacts of term-time working. Each individual student is treated as a case. As different students may have different experiences, attitudes, and outcomes of term-time working, studying a single case may not be able to get a complete answer to the research question. In addition, as pointed out by Yin (2008), analyzing multiple cases can strengthen the results of the study because it allows for replications which can either confirm findings from a single case by finding similar results or complete the findings of the whole study by adding contrasting findings under a different situation (Yin, 2008, pp. 54, 61).

However, it needs to be pointed out that, since the qualitative inquiry is not the major component in the sequential explanatory mixed method design, the primary purpose is to learn about the experiences and insights of individual students on term-time working in order to find out potential explanations on its impacts, rather than to generate a comprehensive theory on the mechanism of the impact. This is why the research question is framed in a "what" way instead of a "how" or "why" way.

3.3.3.2 Interview protocol design

Data used in the qualitative analysis is collected through face-to-face interviews with working students. A semi-structured protocol is designed based on the information needed. This section describes the design of the interview protocol.

The sub-questions under Research Question 3 indicate that information is needed in the following aspects to explore explanations on the impact of term-time working:

1) Demographic information and job characteristics. Demographic information includes student level information such as gender, major, and family background, and institutional level information such as the type and location of the institution. Job characteristics include job location, intensity, and content. These objective data provide a background to understand students' term-time working experience.

2) Motives of working during the term time. Presumably, individuals' motives influence their actions and interpretations of an experience. For instance, a student who works to gain career-related working experience may be more likely to take internships than to work as a private tutor. When working, this student may be more actively

involved than a student whose primary motive is to earn money. As a result, she would be more likely than her counterpart to find term-time working to be meaningful and helpful. Learning about students' motives will help to understand their decisions on term-time working such as what kind of job were taken and how much time and effort were devoted to the job and interpretations of the outcomes of term-time working in terms of gains and losses.

3) Experience of working during the term time. The "experience" here refers to the overall experience during the period of term-time working, including but not limited to what the student did at work, what she did in school during this period, and what she did to manage to work and study at the same time. These are "facts" to be learnt from individual students, which provide the context to understand their perceptions about the outcomes of term-time working.

4) Students' perceptions, explanations, and interpretations about the outcomes of term-time working. This is the major part of information to be collected in this inquiry. Specifically, the following information is needed: the aspects in which students reported gains and/or losses from term-time working; students' explanations about the significance of these gains and losses to them; and students' interpretation about the relationship between term-time working experience and their academic and labor market performances.

Based on the above information, ten questions are designed in the protocol. Table 3.2 presents the information matrix which links the interview questions to research questions and the information needed. The rationale to include each question is given in the last column of the table.

Table 3.2 Information matrix for the qualitative inquiry

Research Question (sub-questions of RQ3)	**Information needed**	**Interview question**	**Rationale for inclusion**
RQ3.1 What are the motives of students to work during the term-time?	Demographic information.	Q1. Please briefly talk about yourself and your college life in general. Q2. Please briefly talk about your term-time working experience.	Q1and Q2 are throw-away questions to develop rapport between the student and the researcher (Berg, 2009, p. 114). They also provide background information for the interview.
	Reasons for students to work during the term-time.	Q3. What made you think about finding a part-time job? What is the most important reason for you to work?	Q3 asks about the student's reasons to work during term time. The answer reflects his/her primary reason. Students are asked to explain why it is important.
RQ3.2: What gains and losses from term-time working do students relate to their academic performances? RQ3.3: What gains and losses from term-time working and labor market performances?	Job characteristics; Students' term-time working experience; Aspects in which students reported gains and/or losses from term-time working;	(Q4~Q9 are asked for each piece of working experience.) Q4. Please describe your job. Q5. What made you choose this specific job? Q6a. Was there any high point during the period of working? Please describe and explain. Q6b. Was there any low point during the period of working? Please describe and explain. Q7a. What were your gains from doing this job? Please explain. Q7b. What were your losses from doing this job? Please explain. Q8. What did you quit the job? (Asked if the interviewee quitted the job.)	Q4 to Q8 are designed with the critical incident technique (Flanagan, 1954). Student's working experience will be treated as a critical incident. The critical incident technique suggests asking "STAR" questions on the Situation/context, Task/intention, Actions, and Results/outcomes (Flanagan, 1954, pp. 337–342). Q4 is the "Situation" question asking about the nature of the job. It has two focuses: 1) job characteristics, and 2) what the student did at work. Q5 tries to explore student's reasons of taking the specific job. When answering this question, the student is expected to link the job characteristics to his/her expectations from the job. It is the "Task/Intention" question. Q6a and Q6b ask about the "Actions", the events that were meaningful to the student. Q7a and Q7b are the "Results" question, asking about the outcomes of taking the job.

	Students' interpretation about the significance of the gains and losses. Students' interpretation about the relationship between term-time working experience and their academic and labor market performances.	Q9. What is the overall influence of working during term time on you college experience? (Q9a. What influence of term-time working on study do you perceive? Q9b. What influence of term-time working on job hunting do you perceive?) Q10. If you could start over again, would you choose to work during college? If yes, what kind of job would you take? Please explain.	Q9 asks about student's perceptions on the overall impact of term-time working and specific impacts on academic and labor market performance. Q10 is a wrap-up question in the form of a hypothetical question. To answer it, the student is expected to reflect on his/her overall term-time working experience, assess the gains and losses regarding to his/her academic and labor market performance. This helps the student to think again and achieve a conclusion about the impact of term-time working.

3.3.3.3 Analytical strategy

Constant comparison method by Glaser (1965) is used to analyze the qualitative data. This method is designed to generate theory grounded in data. It has four stages: 1) comparing incidents within each analytical category, 2) integrating categories and their properties, 3) delimiting the theory and analytical category, and 4) writing the theory (Glaser, 1965, p. 439). As the purpose of this inquiry is to find explanations rather than to generate a theory, the analysis is only done for the first three steps.

In order to understand students' term-time working experience, the critical incident technique by Flanagan (1954) is used in the data analysis. The conceptual framework presented before suggests three major analytical categories to understand the "Process": Motives, Actions, and Outcomes. However, it needs to be pointed out that, in the conceptual framework, the critical incident under examination is college experience, whereas in the inquiry to answer RQ3, the critical incident is term-time working experience. Therefore another category, the Context (in which student worked during college), needs to be added. Within each large category, several sub-categories are identified according to the information needed. Table 3.3 below presents the analytical categories with interview questions and research questions.

Table 3.3 Analytical category

Analytical category	Context	Motives	Actions	Outcomes
Components (sub-categories)	• Student background • Job characteristics	• Financial-related motives • Career-related motives • Other motives	• Choice between jobs • Activities at work • Actions done to balance school and work • Other actions	• Gains and losses in cognitive aspects • Gains and losses in non-cognitive aspects • Perceived impact on academic performance • Perceived impact on labor market performance
Interview Questions	Q1, Q2, Q5	Q3, Q4	Q6, Q7	Q8, Q9, Q10
Research Questions	RQ3.1		RQ3.2, RQ3.3	

The empirical findings of the quantitative and qualitative analysis are presented in Chapters 4, 5, and 6, and are organized in the following way as shown in Table 3.4.

Table 3.4 Structure of the presentation of the empirical findings

Chapter	**Quantitative analysis**	**Qualitative analysis**
Chapter 4	RQ1.1: What percentage of college students work during the term time? RQ1.2: What are the characteristics of college students who work and how do they differ from college students who do not work? RQ1.3: What types of job do the working students take?	RQ3.1: What are the motives of students to work during the term-time?
Chapter 5	RQ2.1: Does term-time working have an impact on students' academic performance? RQ2.3 Does the impacts on academic performance vary by the forms of job (work-study jobs, "off-campus" part-time jobs, and term-time internships) taken by students?	RQ3.2: What gains and losses from term-time working do students relate to their academic performances?

Chapter 6	RQ2.2: Does term-time working have an impact on students' early post-college labor market performance? RQ2.4 Does the impacts early post-college labor market performance vary by the forms of job (work-study jobs, "off-campus" part-time jobs, and term-time internships) taken by students?	RQ3.3: What gains and losses from term-time working do students relate to their labor market performances?

3.4 Data and sample

This section describes data and sample used in the quantitative and qualitative analysis respectively. The quantitative inquiry employs a secondary dataset collected with a nationally representative sample of senior college students. The qualitative inquiry uses first-hand data collected through student interviews.

3.4.1 Data for quantitative inquiry

The quantitative analysis in this study uses the College Students' Labor Market (CSLM) 2011 data. This section describes the data source, analytical sample, measurement and construction of key variables with the CSLM data, and descriptive statistics and correlations of key variables.

3.4.1.1 Data source and sample description

Data used in the quantitative analysis of this study is from the Chinese College Student Survey (CCSS) project conducted by the Institute of Education at Tsinghua University in China. The CCSS project was initiated in 2009 with a purpose to help Chinese universities evaluate and improve the quality of education. It conducts annual surveys with undergraduate students in several dozen colleges and universities in China. One focus of the CCSS project is the post-graduation placement of undergraduate students. The survey instrument used to collect data on this aspect is the College

Students' Labor Market (CSLM) questionnaire designed by the China Data Center and the Institute of Education at Tsinghua University.[11] It collects information on individual characteristics, family background characteristics, high school activity and NCEE performance, college activities, financial situation during college, working experiences during college, and placement after graduation. The questionnaires are distributed to students in the graduating class in late May and June. In China, college students graduate in late June or early July. Therefore by the time of the survey, most students have had a clear idea about their placement after graduation.

The project employs a multi-stage sampling strategy to select participants. First, participating institutions are selected using a stratified sampling strategy by region (Municipalities including Beijing, Shanghai, and Tianjin, Northeast area, East area, Central area, and West area) and by academic ranking level of institution (elite universities, provincial non-key universities, short-cycle higher education institutions, and independent institutions). Second, in each institution, students in the graduating class are randomly drawn based on their student ID to take the survey. Sampling weights are calculated based on the sampling scheme to ensure national representativeness.

This study is part of a collaborative research project between the Center on Chinese Education at Teachers College Columbia University and the Institute of Education at Tsinghua University that aims at exploring factors that influence college graduates' labor market performance. Data from the 2011 CSLM survey is used in the quantitative analysis. In 2011, 8,179 students in 50 institutions were selected to take this survey. The

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[11] The CSLM survey is also called "Follow-up Survey of College Graduates in China".

average responding rate across institutions was about 74%. As this study focuses on students in four-year colleges and universities, the only short-cycle higher education institution with 180 participating students is dropped from the sample. Among the 49 four-year colleges and universities, 13 are from the three municipalities (Beijing, Shanghai, and Tianjin), 5 from the northeastern region, 8 from the eastern region, 11 from the central region, and 12 from the western region. With regards to the level of the institutions, there are 8 universities in both the "985" and "211" projects, another 16 universities in the "211" project, 23 non-key provincial colleges and universities, and 2 independence institutions. With regards to academic concentration, there are 15 comprehensive institutions, 21 science and engineering concentrated institutions, 12 institutions concentrated on teacher training and education, agriculture, finance and economics, and political science and law, and 1 university of minority. Science and engineering concentrated institutions are oversampled.

The student sample used in this study contains students in cohort 2007, i.e. those who entered college in 2007. The purpose of doing so is to eliminate cohort-level differences. Originally, there are 6,983 students in cohort 2007.[12] 4 contracted students are excluded from the sample. These students are funded by the military or public schools and required to work for the funder after graduation. In other word, they already have an employer when they came to college. Furthermore, 1 student from Hong Kong

[12] In the initial sample, there are 59 students in cohort 2005 or before, 271 students in cohort 2006, 60 students in cohort 2008, 115 in cohort 2009, 140 in cohort 2010, 15 in cohort 2011, and 347 students with missing college entry year were excluded. It is very unusually for college students in China to graduate in less than 3 years or more than 6 years.

and 1 student worked in Macau after graduation are excluded, as Hong Kong and Macau are different from the Mainland China. The final cohort 2007 sample contains 6, 977 students.

3.4.1.2 Measurement and construction of variables

This section describes the measurement and construction of some key variables with the CSLM 2011 data.

Variables of in-college working experience

The CSLM 2011 survey asks students the following questions: 1) "Have you ever taken any of the following forms of job during your college years: work-study job, 'off-campus' part-time job, or internship? For each form of job that you have taken, please indicate the starting year and month, total duration (in months), average hours worked per week, and total income from taking that job." 2) "Are you currently taking any work-study job, 'off-campus' part-time job, or internship? If yes, please indicate the form of job and starting year and month." 3) "For your current or the most recent job, please indicate the position, industry, type of employer, amount of months that you have been taking the job, average hours worked per week, and monthly wage of the job." The variables about students' in-college working experience are generated with answers to these questions.

The dummy variable indicating in-college working participation is assigned a value "1" if a student answered "Yes" to any of the questions and a value "0" if answered "No" to all the questions. Three dummy variables are also created for each form of job and assigned a value "1" if the student indicated he/she ever took that form of job. The average hours worked per week and total months worked for each form of working experience are directly from students' answers to corresponding questions. This information is then used to construct the total months worked and average hours worked per week during college. Total months worked during college is the sum of the total months worked for each form, minus the amount of overlapped months between different forms. The average hours worked per week during college is the average between the reported average hours worked per week for each form. Doing so may eliminate variance in working hours across different forms of job for a single individual, it only reflects the average working intensity.

Whether a specific working experience is during term time or vacations is identified with the information on starting year, month, and total months worked for each form of job. In China, a school year starts in fall. The first semester runs from September to mid or late January in the second year. The second semester starts in late February and lasts until early or mid July. Accordingly, a piece of working experience is considered as term-time working if it covers any period between September to early January in the second year, and/or any period between March to early July; otherwise, it is considered as off-term working. Two dummy variables indicating participation in term-time and off-term workings are created, with value "1" equals "Yes" and value "0" equals "No". The total months worked for each working experience is divided to months worked during term time and months worked during off-term with the same rule. Variables indicating average hours worked per week during term time and off-term are generated by averaging the hours worked per week of each piece of working experience during term time and during vacations respectively.

The variables of total months and average hours per week are continuous but have upper limits. In Chinese universities and college, the typical length of an academic semester is about 20 weeks, with the last two weeks usually for exams. As for vacations, the typical length is about 4 weeks in the winter and 6 to 7 weeks in the summer. The commencement of graduation is usually held during late June to early or mid July. Therefore for students who graduate from college in four years, the total amount of months during college is 12 months/year * 3 years (for the first three years) + 10.5 months for the last year = 46 months. The total months during term time is 9.5 months/year * 4 years = 38 months. And the total months during vacations is 2.5 months/year * 3 years + 1 months (winter vacation in the last year) = 8.5 months. These are the upper limits for total months worked during college, term time, and vacations. Any reported total months that exceeds these limits is considered as missing and imputed with the number of total, term-time, and off-term months between the starting time of the corresponding working experience and July 2011 when students in this sample are supposed to leave college. The upper limit of average hours worked per week is set to be 56 hours/week. This equals working for 8 hours per day 7 days per week, or about 11 hours per day 5 days per week, which is much longer than the regular length of full-time jobs as 40 hours per week. However, it is the 95% percentile of reported average hours worked for work-study jobs, and 90% percentile of reported average hours worked for part-time and internship jobs. As the percentage of missing values in reported hours is already about 10%, this looser upper limit is implemented in order to keep sample size. Reported hours that exceed this limit are considered as missing.

In addition to total months worked and average hours worked per week, three variables of total full-time equivalent workdays worked during college, term time and vacations are constructed. The purpose of doing so is to better capture the variation in the intensity of working experience by combining information on months and average hours. The variables are constructed with the following steps: first, convert average hours worked per week to full-time equivalent workdays per week by dividing the hours by 8, i.e. the full-time working hours per day; second, calculate days worked per months by multiplying days worked per week and 4, i.e. the average number of weeks in a month; and third, the total days worked during college, term-time, and off-term are calculated by multiplying days worked per months and months worked during each period. The calculation formula is:

*Totalday or ttday, offday = [avehr, tthr, or offhr)/8] * 4 *(totaldr, ttdr, or offdr) …….(3.4)*

It should be pointed out that values in this set of variables are constructed but not reported by students. They may not present the actual full-time equivalent working days worked by students because students may not take a regular schedule during the period they work. For instance, a student who worked for two months may work for 3 weeks in the first month but 2 weeks in the second months. This is possible as jobs taken by college students are mostly informal and temporary jobs with flexible schedule (T. Li, 2011; Qian, 2011). Therefore these variables cannot be used for descriptive purpose. The primary reason for including these variables in analysis is to capture the variation in total amount of working that cannot be captured by total months worked and average hours worked per week.

Average course score in college

Average course score in college is directly created from the question asking, "What is your average test score in college?" The data was collected in May and June in the senior year. Therefore the average course score in the dataset is for the first three academic years and the first semester of the fourth year.

Early post-college labor market outcomes

The CSLM 2011 survey asks students about their intention after graduation from college, i.e. whether to enter the job market or go to graduate school. It also asks students whether they have applied to any jobs by the time of survey. These questions are used to identify whether a student has an intention to work after graduation. Those who answered that they planned to work after college and/or took the action applying for jobs are considered as having an intention to work after graduation. By contrast, those who planned to go to graduate school are considered as not having an intention to work. The analysis of the impact of term time working on labor market performance is focused on the subsample of students who have an intention to work (hereafter referred to as the "Intention-to-work" sample). The survey then asks students the number of job offer they have received by the time of the survey, and the position, industry, type of employer, location, and monthly wage of the best job offer they have received. This information is used to construct the variables for initial employment status, starting salary, and other job characteristics. Students are considered to be initially "employed" if they have an intention to work and have been offered at least a job by the time graduation; and initially "unemployed" if they have an intention to work but have not received any offer". Starting salary is measured by the monthly wage of the best available offer. Other job characteristics including industry, type of employer, and work province are created with answers to corresponding questions.

Index of socio-economic status (SES)

The purpose to construct the index of socio-economic status (SES) was to reduce dimensions in measuring family background. Most of the family background variables in the original dataset were factor variables with many categories. For instance, parents' education had 12 categories; parents' occupation position had 20 categories; and parents' industry had 18 categories. If these variables were included in the analytic models, the degree of freedom would be reduced dramatically. Therefore a single index was developed based on family background information.

Traditionally, SES is constructed as a weighted sum of education and income using coefficients from regressions of occupation prestige score on education, income, and sometimes age (e.g. Duncan, 1961; Ganzeboom, Graaf, & Treiman, 1992). The occupation prestige score is usually calculated with survey data that asks participants to assess the prestige of occupations. Using this method to compute SES for individual families requires a well-established formula based on valid measurement of occupation prestige score. Such a formula is not available in China so far. A study by C. Li (2005) adjusted Duncan's (1961) model with the Chinese context. Using a nationally representative dataset collected in 2001, she derived a formula for SES based on 81 occupations in China (C. Li, 2005). Her formula was employed by some Chinese studies that involve measurement of socio-economic status (e.g. Guo et al., 2010). However, a recent survey in 2009 showed that the occupation prestige had changed a lot in the past decade (Qiang Li & Liu, 2009). In this case, it may not be appropriate to use C. Li's (2005) formula to compute SES score with the 2011 data.

This study used the Principal Component Analysis (PCA) to derive SES scores for individual students. It is a popular method to construct SES in recent years (e.g. Houweling, 2003; Krishnan, 2010; Vyas & Kumaranayake, 2006). The PCA technique, developed by Pearson (1901) and Hotelling (1933), is a technique of dimension reduction which converts a large set of variables into a smaller set of linearly orthogonal factors that account for the majority of variance among the original variables. These factors are called principal components. By design, the first component accounts of the largest possible variance in the original variables. In the applications of PCA in SES construction, the first component is assumed to represent the socio-economic status (Houweling, 2003).

Variables included in PCA should have some correlation with other variables, as they are supposed to measure the same thing (Field, 2007, p. 648). This requirement can be tested with the Bartlett's Test of Sphericity which tests whether the variables used in PCA are uncorrelated. In addition, a Kaiser-Meyer-Olkin measurement of sampling adequacy (KMO) is usually used to detect the pattern of the correlation in the data. The KMO measure compares the sum of correlations to the sum of partial correlations in the variables (Kaiser, 1970). It can be calculated for individual variables or for all variables included in the analysis. The value ranges from 0 to 1, with a value 0 indicating that the sum of the partial correlation is large relative to the sum of correlations, which means that there may not be common factors among the variables (Field, 2007; Krishnan, 2010). It is suggested that a value greater than 0.5 is acceptable (Kaiser, 1974), a value between

0.5 and 0.7 is “mediocre”, a value between 0.7 and 0.8 is “good”, a value between 0.8 and 0.9 is “great”, and a value above 0.9 is “super” (Hutcheson & Sofroniou, 1999). On the other hand, the correlations should not be too strong, i.e. $r > 0.8$; otherwise, there will be the problem of multicollinearity. The multicollinearity can be detected with the determinant of the correlation matrix, which should be greater than 0.00001 (Field, 2007, p. 648).

In this study, information used to construct SES includes parents’ education level, parents’ occupations, annual household income, and household wealth as measured by type and area of resident dwelling. In the original dataset, most of the variables except household income and area of residency are categorical variables. As suggested by Vyas & Kumaranayake (2006), categorical variables are not suitable for PCA analysis, because the quantitative scale does not have any meaning. Therefore these variables need to be recoded as binary variables. However, as there are more than ten categories in many variables, including a binary variable for each category leads to a KMO value far below the “acceptable” threshold 0.5. To solve this problem, the categorical variables are recoded in the following ways:

i. Parents’ education levels are recoded into years of schooling based on the rule specified in Du and Yue’s (2010) paper: “no school” is recoded as having 0 years of schooling, “primary school graduate” as 6 years of schooling, “junior middle school graduate” as 9 years of schooling, “high school graduate” or “secondary vocational school graduate” as 12 years of schooling, “post-secondary vocational college” as 14.5 years of schooling, and “college graduate” as 16 years of schooling (Du & Yue, 2010, p. 68).

As for people with graduate school experience, Du and Yue (2010) coded their years of schooling to be 19 years without further differentiation of master degree holders and doctoral degree holders. In this paper, "master degree holders" is coded as having 19 years of schooling, and "doctoral degree holders" as 22 years of schooling. This recoding rule represents the typical length of schooling in each education level in China.

ii. Three sets of binary variables describing parents' occupation information are created based on job position, industry, and nature of employer. These new variables are created at the household level, so a value of 1 in each variable indicate that at least a parent in the household belonged to that category. The first set of variables describes the position or nature of one's occupation. The categories include whether a parent in the household was a manager or leader, a professional staff (i.e. high-skilled workers), a ordinary staff (e.g. office clerks, sales, etc), self-employed (e.g. small business owners, peddlers, etc.), a manual worker or farmer, or unemployed/not in the labor force. The second set of variables describes the industry where the parent worked. The categories are whether a parent in the household worked in the manufactory industry, retail or service industry, high-income industry including IT and finance industries, or public service industries including education and medical service. The third set describes the nature of the employer. The categories are whether a parent in the household worked for the government, for public institute, for enterprises, or for self-owned business.

iii. The type of the dwelling is recoded into 6 categories: dwelling in rural area, dwelling in low-rate community, dwelling in town, dwelling in the residency community of one's employer, ordinary commercial dwelling, and commercial dwelling in high-income community.

The continuous variables, household income and area of dwelling are transformed with natural logarithm to avoid skewness and kurtosis in distribution. The outliners in these variables are deleted because PCA was very sensitive to outliners. Observations with missing value in these variables are also dropped. Finally 5, 231 observations are included in the analysis.

The transformed and recoded variables are included in the PCA analysis. The correlation matrix is investigated and variables with too weak (none of the correlation parameters was greater than 0.2) or too strong correlation (any correlation parameter was greater than 0.9) with other variables are dropped. Further more, variables with individual KMO value less than 0.5 are also dropped from the analysis. The decision of which variables to drop is made with an attention to ensure that at least two variables are kept from each of the three sets of variables describing parents' occupation information. At last, 14 variables are included in the analysis: all the 4 continuous variables: household income (in log form), father's years of schooling, mother's years of schooling, and area of dwelling (in log form); 2 variables describing type of dwelling: whether a rural dwelling and whether an ordinary commercial dwelling; 4 variables describing parents' occupation position: whether any of the parents was a manager, a professional, a ordinary staff, and a manual worker or farmer; 2 variables describing the nature of parents' employers: whether any of the parents worked for the government, and whether any of the parents worked for public institutions; and 2 variables describing the industry in which the parents worked: whether any of the parents worked in the public service industries (education and medicine), and whether any of the parents worked in the service and retail industry.

The output of the final PCA analysis is presented in Appendix 1. The requirements for PCA discussed above are satisfied. The null hypothesis of the Bartlett's Test of Sphericity is rejected with a p-value of 0.000, indicating that the variables are correlated. The KMO value of all the variables is 0.805, indicating that it is proper to take PCA with this set of variables. The determinant of the correlation matrix is 0.019, larger than the necessary value of 0.00001, indicating that there is no serious problem of multicollinearity. Finally, five principal components with eigenvalues greater than 1 are derived. The first component explained 30.35% of the total variance in the variables included in PCA analysis. Following previous studies, this component is used as the SES score for the family.

After the PCA analysis, extreme cases and cases with missing values are added back in three steps: First, impute missing values in the original variable with group means for continuous variables and group modes for categorical variables. Extreme values were treated as missing and imputed in the same way. Second, create the variables included in the PCA analysis with the imputed variables. Third, calculate and impute SES with the factor loadings from the PCA. As a robustness check, the SES score and imputed SES score are regressed on the original family background variables. All of the variables are significant in predicting SES score and the direction of signs of the coefficients are all as expected. The R-squares are above 0.92. This suggests that the constructed SES score is a good summary of the variance in these variables.

Other covariates

Most of the covariates describing students' demographic background and college experience as listed in Table 3.1 are directly created with the answers to corresponding questions in the questionnaire. Additional modifications are done to two variables. First, the reported NCEE scores are rescaled into a 100-point scale as there are two provinces using different grading scales from the others. Second, the academic area of students' major (i.e. humanity, science, engineering, etc.) is adjusted based on the catalog of undergraduate programs announced by the Minister of Education (MoE) in China. The CSLM 2011 questionnaire asks students' to indicate their major area as well as the specific program. However there are some miss-categorizations in the self-reported major area. For instance, the program of "Industrial Engineering" is listed below the area of Management in the MoE catalog; but some students report it as engineering major. The MoE categorization is used instead of the self-reported categorization to ensure the accuracy of data and make the descriptive statistics of the sample more comparable to the MoE statistics.

3.4.1.3 Descriptive statistics and correlations on key variables

This section presents the descriptive statistics of the sample and the correlations between key variables.

Descriptive statistics of the sample

Table 3.5 presents descriptive statistics of key variables for the whole sample. Sampling weights are applied in calculation. In the whole sample, the weighted average age of students in 2011 is about 23 years old. About 47.3% of students in the whole sample are female. This is consistent with the statistics provided by the Ministry of Education (MoE) of China on gender ratio of the Cohort 2007 students in four-year colleges.[13] 5.3% of students in the whole sample are minority, a little lower than the national statistics which shows that minority students accounted for 7.8% of the total enrollment of four-year colleges in 2011 (no statistics was available for Cohort 2007). 36.4% of students in the whole sample are the only child in their family, 43.2% are from rural area, and about 46% are from central and west area. The average household income of the sample is about 47,000 RMB Yuan per year. Students in first-tier institutions account for about 19% of the whole sample, with 6.7% enrolled in "985" institutions and 12.3% in "211" institutions. About 22.2 % of students in the whole sample are from comprehensive universities, and about 43.3% of students are from engineering-concentrated institutions. In addition, about 54.4% of students have a major in sciences and engineering. The statistics from the MoE shows that science and engineering students account for 41.61% of the Cohort 2007 in four-year colleges. This indicates that our whole sample is over-representative of science and engineering students.

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[13] Data source of national statistics: Ministry of Education: http://www.moe.gov.cn/publicfiles/business/htmlfiles/moe/moe_2904/index.html

As for college experience, the average score in college is around 80, with a standard deviation of 6.8. The majority (about 65%) of students have a positive attitude towards their major, and about 7% have an academic minor. About 20% fail to pass the CET-4 test and about one-third have passed the CET-6 test. The average hours spent on studying after class is 13.4 hours, but the standard deviation is relatively large, which is about 9 hours. This indicates that the effort students spend on study varies a lot. As for non-academic experience, 78% of students in the whole sample have in-college working experience, and 62.7% have term-time working experience. About 22% of students are leaders in departmental or institutional level student organizations. 29.5% of students are CCP members. This percentage is higher than the most recent available data from the MoE, which shows that in 2009, student CCP members account for 8.9% of the total enrollment in four-year colleges. The high percentage in this sample might be attributed to the fact that this sample contains only senior year students. The age threshold to join the Party is 18 years old and it takes at least two years to become a formal CCP member since the submission of application. Therefore the member of student CCP member increases a lot in the last two years in college (F. Wang, 2013). About 47% of students in the whole sample have professional certificates.

With regards to the price of college, the level of tuition and fees is regulated by provincial governments based on major and academic ranking level of institution. The average tuition is about 5,700 RMB per year, with a standard deviation of about 3,100 RMB. The standard deviation is relatively large. This is because some institutions do not charge or charge very low tuitions for some majors in agriculture and education, while the tuitions for arts majors are usually around 10,000 RMB per year in all institutions. In addition, there are some international cooperative programs in some institutions. Tuitions for these programs are usually about 12,000 to 15,000 RMB per year. Independent institutions also charge relatively high tuitions, which is 10,000 RMB per year, as these institutions are not public-funded institutions. Compared to tuitions, boarding and other fees account for a relatively small part of the price of college and the variation is relatively small across institutions. Therefore these fees are not included in the analysis.

As for the sources of financial support, students in the whole sample on average receive 9,500 RMB per year from their family. The standard deviation is about 6,000 RMB, which is reasonable because students are from different family background. About 34% of students have merit-based financial aid, and about 21% have need-based financial aid. The average total amount of financial aid is 2,300 RMB per year with a standard deviation of 2,400 RMB. The amount of financial aid varies a lot. Student loan is another type of financial aid for college students in China. About 28% of students have taken student loans for college or their families have taken loans to support them.

As for post-college labor market performance, 53.2% of students in the whole sample have been offered a job by the time of survey. The average monthly wage is about 2,400 RMB, and the standard deviation is about 1,200 RMB. The most popular industry is manufactory, following by computer science industry. About 40% of students who have an offer are employed in these industries. This is probably because over half of the students in this sample majored in science and engineering. As for the employer’s type, about 42% of students with an offer are employed by private owned firms, 29% by state- or public-owned firms. Only 9% are employed by governments or public institutes.

With regards to working place, about half of students go to work in the three municipalities and the east region. About 37% of students go to work in a province other than where their institution locates.

The overall missing rate of variables in this sample is not high. As shown in Table 2, the missing rates of most of the covariates are below 5%. Two covariates, NCEE score and Family fund, have missing rate higher than 10% but lower than 20%; and another two covariates, SES score and Hours spent per week on studying after class, have missing rate around 22%. As for the three dependent variables, Average score in college, Being employed, and Wage per month, the missing rate is 22%, 0, and 10.37% respectively.[14] Observations with missing values in these variables are deleted from the analysis. As for the key explanatory variables: Whether worked during term time, Total months worked during term time, and hours worked per week during term time, the missing rate is 10.26%, 6.69%, and 13.4% respectively.[15] Observations with missing values in these variables are also deleted from the analysis. Missing values in covariates are treated with the Dummy Flag method.

Correlations between covariates

In order to avoid severe multicollinearity among explanatory variables, the correlation matrix as presented in Table A2 in the Appendix 2 is investigated. The table shows pair-wise Pearson correlation coefficients between covariates. Overall, the

[14] The missing rate of Wage per month was for those who were employed by the time of survey in the "Intention-to-Work" sample (sub-sample size=3,547).
[15] The missing rate of Total months worked during term time and Average hours worked per week during term time was for those who worked during term time (sub-sample size=4,277).

correlation coefficients between most covariates are smaller than 0.3, indicating that there are no strong correlations between these variables. There are two groups of covariates with correlation coefficients above 0.5. The first group contains rural "Hukou", single child, and constructed SES score. The Pearson correlation coefficient between SES and rural "Hukou" is -0.66. This is reasonable because rural "Hukou" is highly correlated with the rural dwelling variable used in SES construction (r=0.85). The correlation coefficient between single child and SES is 0.52. This may because families with higher socio-economic status are more likely to obey the Population and Family Planning Law. Single child also has a relatively strong correlation with rural "Hukou" (r=-0.46), this may because the Law allows some rural families to have two children. Though the Pearson correlation coefficients between these variables are relatively high, when included in regression models, the Variation Inflation Factors (VIF) of these variables are all smaller than 3. Therefore these variables are kept in the models.

The second group is the location of residency, institutions, and work place. The Pearson correlation coefficient is 0.69 between the residency province and institution province, 0.67 between residency province and work province, and 0.66 between institution province and work province. This is because about two-third of students in the sample go to college in their home province, and about 57% of those who are employed by the time of survey work either in their home province or in the province where they attend college. As the location variables enter the models as sets of dummies, including all of them make raises the problem of multicollinearity. The pair-wise correlation coefficients between residency region, institution region and work region are also above 0.6. Therefore in the model for academic performance and the model for initial employment status, variables indicating whether the student is from the municipalities, whether from central or west part of China, whether the institution locates in the municipalities, and whether the institutions locates in central or west part of China are used instead of full sets of residency and institution locations. Doing so keeps the VIFs of all variables in the model under 5. In the model for starting salary, the work province dummies are still included in order to control of wage difference in difference provinces. Therefore the dummies for residency and institution locations are dropped to keep all the VIFs under 5.

There are also some covariates between which the Pearson correlation coefficient is between 0.3 and 0.5: high school academic track and college major (r=0.45), NCEE score and English proficiency (r=0.41), NCEE score and institution level (r=-0.49), and CCP member and have merit need (r=0.35). The VIFs for these variables in regression are all smaller than 3. Therefore these variables are still included in the models.

Table 3.5 Descriptive Statistics of Variables in the whole sample (Weighted) (Sample size=6,977)

Variable	Variable name	Mean /percentage	Std. Dev.	Missing rate (%)
Panel 1. Individual and family characteristics				
Age	age	22.99	1.00	2.11
Gender (female=1) (%)	female	47.27		0.46
Race (minority=1) (%)	minority	5.25		0.95
Single child (Yes=1) (%)	singlechild	36.38		1.10
Region of residency before college (%)	resregion			2.94
Municipality		8.40		
East		29.17		
Northeast		13.06		
Central		25.81		
West		20.17		
Rural (Yes=1) (%)	rural	43.15		0.32
Annual household income (in RMB)	housinc	46964.20	42248.06	18.26
SES score (constructed)	SES	-0.15	0.97	22.33
NCEE score (rescaled to 1~100)	ncee100	70.41	7.88	12.05
High school academic track (%)	track			1.20
Humanity		24.87		
Science		67.98		
Arts and athlete		5.78		
Ever worked in high school (Yes=1) (%)	hswork	3.05		0.00
Student leader in high school (Yes=1) (%)	seniorleader	41.62		0.00
Panel2. College experience				
Average score in college	avescore	79.64	6.80	22.06
Major (%)	major		*(National stats)*	0.23
Liberal Arts		13.83	*12.09*	
Social sciences		8.25	*7.62*	
Sciences & engineering		54.43	*41.61*	
Econ & Management		16.88	*33.82*	
Others		6.27	*15.60*	
Preference degree of one's major (%)	likemajor			2.52
Not at all		7.97		
A little bit		28.38		
Somewhat		47.41		
Very much		12.31		
Whether has a minor (%)	hasminor	7.03		1.99

(Table 3.5 continued)

Variable	Variable name	Mean /percentage	Std. Dev.	Missing rate (%)
English (%)	English			2.90
Not passed CET4		20.24		
Passed CET4		42.48		
Passed CET6		33.37		
Hours spent per week on studying after class	reviewtime	13.42	9.09	22.63
Ever worked in college (Yes=1) (%)	worked	78.12		2.26
Ever worked during term time (Yes=1) (%)	termtime	62.74		10.28
Ever worked during vacations (Yes=1) (%)	offterm	28.94		10.29
Leader in student organizations (Yes=1) (%)	stleader	21.78		0.00
CCP member (Yes=1) (%)	Partymember	29.54		0.93
Professional certificate (Yes=1) (%)	certificate	45.65		0.00
Tuition (sticker price, in RMB)	tuition	5629.19	3077.38	0.07
Family fund (in RMB)	familyfund	9412.62	5826.81	18.55
Total financial aid (in RMB)	finaid	2266.73	2409.46	3.55
Had merit aid (Yes=1) (%)	hadmeritaid	34.13		0.00
Had need aid (Yes=1) (%)	hadneedaid	21.09		0.00
Had loan (Yes=1) (%)	hadloan	27.92		2.85
Panel 3. Institution level characteristics				
Ranking level of institution (%)	instlevel			0.00
985 institution		6.65		
211 but not 985 institution		12.28		
non-key institution		69.72		
Independent college		11.44		
Concentration of institution (%)	instcon			0.00
Comprehensive institution		22.18		
Engineering-concentrated institution		43.34		
Others concentration		34.48		
Region of institution (%)	instregion			0.00
Municipality		14.48		
East		25.68		
Northeast		15.53		
Central		25.09		
West		19.21		
Location of campus (%)	instloc			0.00
Urban		18.61		
Urban & suburban		3.89		
Suburban		32.50		
Small-scale city		44.99		

(Table 3.5 continued)

Variable	Variable name	Mean /percentage	Std. Dev.	Missing rate (%)
Percentage of working students in the original sample	workp	0.75	0.12	0.00
Percentage of students worked during term-time in the original sample	ttp	0.59	0.15	0.00
Panel 4. Job characteristics				
Had an offer by graduation (%)	haveoffer	53.20	0.50	0.00
Wage per month (in RMB)	wage	2381.99	1210.58	11.55
Industry (%)	industry			4.42
Agriculture/Fishing/Forestry		2.30		
Mining/Manufactory/Construction		24.55		
Utilities/Energy		5.53		
Transportation/Storage/Postal		3.98		
Telecom/Computer service and software		14.61		
Wholesale/Retail		3.72		
Hospitality/Food services		2.44		
Finance		6.66		
Real Estate		3.68		
Lease & business service		1.94		
Education		7.87		
Medical care		2.70		
Culture/Sport/Social utility		4.38		
Science & research/technology service		5.15		
Water conservancy/Environmental Protect		1.20		
Community service and other services		1.47		
Government/NGO/international organization		1.32		
Other		1.44		
Type of employer (%)	emptype			5.70
Government or social organization		1.71		
Public institute		7.53		
State- or public- owned firms		28.95		
Foreign- or co-owned firms		11.01		
Private-owned firms		41.81		
Self-initiated business		1.36		
Region of work place (%)	workregion			11.60
Municipality		14.72		
East		37.21		
Northeast		6.76		
Central		13.00		
West		14.93		
Migrant for work (% of who have offer)	migwork	37.15		11.63

3.4.2 Data for qualitative inquiry

Data used in the qualitative inquiry is collected through interviews with senior college students who have term-time working experience. This section describes the data collection process.

3.4.2.1 Sample selection strategy

The sample used for the qualitative analysis consists of senior students who have term-time working experiences during college. There are two reasons to constrain the sample to senior students. First, students in quantitative sample are all senior students; therefore the qualitative sample should also be drawn from senior students to make the analysis consistent. Second, senior students are in a better position than students in other grade to reflect on their entire college experience.

Following Yin (2008), individuals to be interviewed are purposefully selected so that each case "either (a) predicts similar results (a literal replication) or (b) predicts contrasting results but for anticipatable reasons (a theoretical replication)" (Yin, 2008, pp.54). Specifically, the study uses the maximum variation sampling strategy specified in Patton (2002). The purpose of this strategy is to capture the central themes that cut across a heterogeous population with a small but diverse sample. The logic is that any common patterns emerged from a sample with the maximum variation should be valued "in capturing the core experiences and central, shared dimensions of a setting or phenomenon" (Patton, 2002, p. 235). Using maximum variation sampling within the mutiple-case study framework enhances the analytical generalizability of the qualiative findings and therefore strengthens the whole study.

The qualitative inquiry in this study aims to find out common patterns in students' motives and perceived outcomes of term-time working. Therefore the sample should contain maximum variations on factors that may influence the motives and outcomes. As suggested by the human capital theory and previous empirical studies in the U.S., the motives of working during term time may be different for students with different levels of ability and motivation and from different family backgrounds (DesJardins, McCall, Ott, & Kim, 2010; Dundes & Marx, 2006; Kalenkoski & Pabilonia, 2008; J. E. King, 2006; Titus, 2010). The outcomes of term-time working, as suggested by the college impact theories and empirical studies, may depend on individual student's ability and motivation (Salisbury, Padgett, Pascarella, 2009) and the type of job in terms of location (Ehrenberg & Sherman, 1987; Flowers, 2010; Furr et al., 2000; McCormick et al., 2010; Moore & Rago, 2009) and relevant to student's academic and/career plan (Aper, 1994). Based on these studies, the sample for this study should be diverse on (a) student ability and motivation, (b) student family background, and (c) type of job. Yet in practice, it is difficult to represent the variations in these aspects with a small sample. So this study uses stratified purposeful sampling technique to select students from stratified groups. Patton (2002) suggests that doing so helps to capture major variations, though it results in a sample that is less than a full maximum variation sample (Patton, 2002, p. 240).

Specifically, the study uses the following sampling strategy to achieve maximum variation in these aspects:

1. Select two institutions from different academic ranking level. The college admission procedure in China sorts students into different levels of universities based on their performance in the NCEE exam. If we believe that the NCEE

score reflects student's ability and motivation in the way that students with higher NCEE scores are more able and motivated, then universities with different admission cutoffs can be considered as different ability groups. Taking advantage of this, one "985" institution that has the highest NCEE score cutoff and one provincial non-key university that has relatively low NCEE score are selected as the pool of interviewees. Doing so ensures that the qualitative sample contains students from different ability groups.[16] The two universities are chosen from participating institutions in the CSLM 2011 survey in order to be coherent with the quantitative analysis. In addition, these two universities are located in different cities: the "985" university locates in City A, which is one of the largest municipalities in China; while the non-key university in City B, which is a city with a population of 23 million in the east region. City B is less developed than City A in terms of economic development level and resident's consumption level. This helps to maximize variation in the sample as students in these two universities are from different background and face different environment in college.

2. Within each institution, select students with different gender, family background, and academic major. Family income is the most influential family background factor on term-time working decisions found in previous U.S empirical studies, as family income determines the amount of funding available for a college

[16] This will also help to maximize the variation in socio-economic backgrounds in the sample, as the top university and the provincial university have students from somewhat different socio-economic backgrounds.

student. Students from low-income families form a special group that attracts many policy attentions. They face a greater financial burden when attending college than students from mid- or high-income families. They may have different college experiences than other students; and the meaning and experience of term-time working may also be different for them. Therefore it is necessary to make sure that the sample includes these students. Gender is also an influential factor on term-time working behaviors and outcomes. For instance, a U.S. study showed that the impact of taking work-study jobs was negative for female students but positive for males (Scott-Clayton, 2011). Though no other studies found the same pattern, it may still be worthwhile to maintain variation in gender to allow for emerging themes. Similarly, the term-time working experiences and outcomes may also be different for students with different majors. For instance, students in practical majors, such as business and nursing, may be more actively seeking for internships and may gain more from working than students in other majors. Again, though this hypothesis lacks empirical support, it is plausible to allow for variation in this dimension. Specifically, students in the qualitative sample are from the four main areas of study: humanity, liberal arts, and social studies, natural sciences, engineering, and business.

3.4.2.2 Recruitment and composition of the qualitative sample

The interviews were conducted in May 2013. Interviewees were recruited with the help of officers in the Office of Student Affairs of each institution. A small amount of monetary compensation was provided to the interviewees. This is a common practice to recruit interviewees in China. Because of practical reasons, the recruitment processes were different in the two institutions. In the "985" institution, broadcast emails about the research were sent out to students in the graduating class by the school officer and students were asked to contact the researcher directly if interested. In the non-key institution, the school officer asked student mentors in each department to contact and recommend potential interviewees. Both ways had advantages and disadvantages. In the "985" institution, as interviewees voluntarily participated in the interview, they on average had multiple pieces of working experiences and deep insights about term time working. However, the researcher was in a passive position in approaching potential interviewees, i.e. waiting to be contacted by those who were interested in the interview, and therefore was not able to exercise more control over the composition of the subsample in that institution. In the non-key institution where interviewees were reached and recommended by student mentors, the composition of this subsample satisfied all the criteria presented above. However, the drawback was that most of students in this subsample were student leaders, who might be different from other students in that institution. These potential biases need to be taken into account in further analysis.

The interviewee sample contains 8 students from the "985" institution and 10 from the non-key institution. All of them are in the graduating class. There are 7 male students and 11 female students in the whole sample, with 3 males and 5 females in the "985" institution and 5 males and 5 females in the non-key institution. 6 students are from rural area and all of them are in the non-key institution sample. In the "985" institution sample, though no students are from rural area, there is one student whose parents are manual workers and 2 students from less developed cities in the west and central area. With regards to academic major, there are 5 students with humanity majors, 2 with arts majors, 5 with engineering majors, 2 with sciences majors, and 4 with business majors in the whole sample. In the subsample of the “985” institution, there are 3 students with humanity major (all majored in English), 2 students with arts majors, 2 students with engineering majors, and 1 students with business major. The subsample of the non-key institution has a greater variation in terms of major. There are 2 students with humanity majors, 3 with engineering majors, 2 with sciences majors, and 3 with business majors.

Overall, individuals in the qualitative sample vary in gender, family background, academic ability group, and academic major. Most students in this sample have 2 or more pieces of working experience in different forms. With regards to the plan after college, 7 students in the whole sample planned to work, 3 from the “985” institution and 4 from the non-key institution. All these students have been offered a job by the time of the interview, but one student in the non-key institution declined the offer for family reasons. The other 11 students planned to go to graduate school. Table 3.6 presents a list of interviewees, along with their basic information and in-college working experience. Pseudonyms are used to protect the identity of the interviewees.

Table 3.6 Basic information of interviewees

	Pseudonym	Institution	Major	Plan after graduation	Social class	In-college working experience
1	Mr. Ming	"985"	English Literature	Work (management trainee for a human resource company, abroad)	Working class	2nd yr summer: (**work-study**) dorm assistant (1 month) 3rd yr summer: (**internship**) management trainee in a manufacturing company (2 months)
2	Mr. Hou	"985"	Industrial Engineering	Work (analyst for a professional services firm)	Middle class	1st yr spring: (**part-time**) private tutoring (3 months) 2nd yr summer: (**part-time**) summer camp mentor (2 weeks) (**internship**) marketing and sales representative in a large beverage company (1 month) 3rd yr fall: (**internship**) office assistant in a business consulting company (1 week) 3rd yr winter: (**internship**) assistant customer executive in a comertial bank (2 months) 3rd yr spring: (**internship**) part-time project assistant in a foreign-owned business consulting company (3 months) 3rd yr summer: (**internship**) project assistant in a foreign-owned business consulting company (2.5 months)
3	Ms. Jing	"985"	Information Art & Design	Graduate school	Middle class	1st yr winter: (**work-study**) dorm assistant 2nd yr term-time: (**work-study**) member of the student work-study association (whole year) 2nd yr summer: (**part-time**) summer camp menter 3rd yr summer: (**internship**) assistant in a startup company (**internship**) assistant designer in a dot-com company 4th yr winter: (**internship**) assistant designer in a dot-com company Any term-time: (**odd-jobs**) small designing projects
4	Ms. Xin	"985"	English Literature	Graduate school	Middle class	Pre-college: (**part-time**) private tutoring (several months) 4th yr fall: (**internship**) intern in a government department (4 months)

(Table 3.6 continued)

	Pseudonym	Institution	Major	Plan after graduation	Social class	In-college working experience
5	Ms. Meng	"985"	English Literature	Graduate school (abroad)	Middle class	1st yr spring & summer: (**internship**) assistant in an educational startup company 1st yr summer: (**part-time**) on-campus sales representative (1 month) 3rd yr spring & summer: (**internship**) assistant in a foreign-owned public relations company (4 months) 4th yr spring: (**part-time**) English tutor for a educational consulting company (ongoing)
6	Ms. Wen	"985"	Industrial Design	Graduate school	Middle class	1st yr vacation: (**part-time**) investigator in a market research company 2nd & 3rd yr term time: (**work-study**) member of the student work-study association (whole years) 3rd yr summer: (**part-time**) summer camp mentor 4th yr spring: (**internship**) project assistant in a Business school
7	Mr. Xiao	"985"	Mechanical Engineering	Graduate school	Working class	1st yr term-time: (**part-time**) on-campus sales representative 2nd yr term-time: (**part-time**) private tutoring 4th yr spring: (**work-study**) campus security (less than 1 month) (**part-time**) private tutoring (less than 1 month) (**internship**) marketing assistant in a pharmaceutical company (ongoing)
8	Ms. Guo	"985"	Finance	Work (analyst for a fund management company)	Working class	2nd yr fall: (**work-study**) librarian 2nd yr summer: (**part-time**) summer camp mentor (**internship**) assistant analyst in a venture company (1 month) 3rd yr summer & 4th yr fall: (**internship**) assistant analyst in the R&D department of a software company (3 months)

(Table 3.6 continued)

	Pseudonym	Institution	Major	Plan after graduation	Social class	In-college working experience
9	Mr. Guang	non-key	Chinese Literature	Graduate school	Rural	1st yr spring: (**part-time**) flyer distributor (4~5 weekends) 2nd yr fall: (**part-time**) waiter for 2 restaurants (5 weeks in total) (**part-time**) private tutoring (3 months) 3rd yr term-time: (**odd jobs**) writing articles for newspapers and magazines 4th yr winter: (**work-study**) office boy (2 months) 4th yr winter to spring: (**internship**) assistant journalist in local newspaper (ongoing, unpaid)
10	Ms. Ling	non-key	International Economics	Graduate school	Working class	3rd yr term-time: (**part-time**) waitress for a restaurant (1 month) 4th yr fall: (**part-time**) sales promotion person in a small shop, flyer distributor
11	Ms. Ran	non-key	International Economics	Work (foreign trade salesman for a trade company)	Working class	Term-time: (**part-time**) tutor for a private tutoring institution (more than 1 year) Vacations: (**part-time**) flyer distributor, sales promotion person.
12	Ms. Cong	non-key	International Economics	Prepare and apply to graduate school	Working class	3rd yr term-time: (**part-time**) waitress for a restaurant (1 month) A summer: (**part-time**) teaching assistant for an English tutoring company (1 week)
13	Ms. Wang	non-key	Material Engineering	Work (staff in a R&D center)	Rural, working class	2nd yr fall: (**part-time**) private tutor (3 tutoring jobs in the same period) 2nd yr summer to 3rd yr winter: (**part-time**) private tutor (6~7 months) 3rd yr spring to 4th yr: (**part-time**) private tutor (ongoing) 4th yr spring: (**internship**) research assistant in a R & D center (will continue to work for this company after graduation)

(Table 3.6 continued)

	Pseudonym	Institution	Major	Plan after graduation	Social class	In-college working experience
14	Mr. Yong	non-key	Applied Physics	Work (staff in a manufacturing company)	Rural	2nd yr fall: (**part-time**) surveyor (8~9 days); waiter (5 days) 2nd yr summer: (**part-time**) manual worker in a factory (1 month) 3rd yr: (**part-time**) on-campus sales representative (more than 1 year, ongoing) 3rd yr summer: (**part-time**) summer tutoring camp (organizer and teacher, 1 month) 4th yr fall: (**part-time**) waiter (1 month)
15	Mr. Liang	non-key	Electronic and Information Engineering	Graduate school	Rural	Pre-college: (**part-time**) waiter and security 1st yr spring to 2nd yr winter: (**part-time**) on-campus sales representative (1 year) 1st yr summer: (**part-time**) private tutor 3rd yr spring to 4th yr spring: (**internship**) research assistant in a lab of computer science (more than 1 year) 4th yr spring: (**internship**) programmer in a software company (just started)
16	Ms. Yan	non-key	Information Management	Work (had an offer of sales representative, but did not take because of family issue)	Rural, low-income	Term-time (since 1st yr): (**part-time**) sales promotion person, flyer distributor, private tutor (short period) Vacations: (**part-time**) waitress, sales, teacher for tutoring center 3rd yr term-time: (**part-time**) on-campus sales representative 4th yr spring: (**part-time**) sales (**internship**) sales representative for an insurance company (attended a three-week training, quit after one week of on-site working).
17	Ms. Xiang	non-key	Statistics	Graduate school	Rural	1st yr summer: (**part-time**) private tutor 2nd yr & 3rd yr term time: (**part-time**) private tutor (2 jobs in the same period) 2nd yr summer: (**part-time**) manual worker in a factory (2 weeks) 3rd yr summer: (**internship**) interns in the local Bureau of Statistics (3 weeks, arranged by the institution)

(Table 3.6 continued)

	Pseudonym	Institution	Major	Plan after graduation	Social class	In-college working experience
18	Mr. Sen	non-key	History	Graduate school	Working class	1st yr fall: (**part-time**) waiter (20 days) 1st yr spring: (**part-time**) private tutor (2 months) 2nd yr summer: (**part-time**) summer tutoring camp (organizer and teacher, 1month) 3rd yr summer: (**part-time**) summer tutoring camp (teacher, 2 months) Term-time: (**Odd-jobs**) flyer distributor

Chapter 4 The current situation of term-time working in college in China

This chapter presents empirical findings on the current situation of student term-time working in Chinese colleges and universities. The quantitative analysis is presented in Section 4.1 to Section 4.3, as an answer to the first research question. Section 4.1 describes the incidence and characteristics of term-time working with descriptive statistics. Section 4.2 presents a comparison between working and non-working students. Section 4.3 discusses factors that influence students' term-time working status with quantitative analysis. Section 4.4 presents qualitative findings on students' motivations of working during term time, answering Research Question 3.1 (What are the motives of students to work during the term-time?). Section 4.5 concludes the chapter.

4.1 The incidence and characteristics of term-time working

Though there is no national statistics on the incidence of term-time working in Chinese universities and colleges, previous survey studies in different institutions and different areas suggest that it is very popular among undergraduate students in China. This section describes the incidence and characteristics of term-time working in four-year universities and colleges in China with the CSLM 2011 data. Table 4.1 presents the percentage of working students in the sample and Table 4.2 presents descriptive statistics of the characteristics of term-time working experience.

A high percentage of students in this sample have term-time working experience. As shown in Table 4.1, about 62.7% of students in the sample ever worked during term time in college. 36.1% of these working students also worked in summer and winter vacations. Another 6.3% of students in the whole sample worked only in vacations. Overall, about 78.1% of students worked at some point during college. This percentage is similar to the most recent survey studies (e.g. B. Chu et al., 2010; Z. Jing et al., 2010; L. Li et al., 2011; Qian, 2011; Tong et al., 2011, etc.). It shows that term-time working has become a prevalent phenomenon among college students in China.

Table 4.1 Incidence of in-college working in China
(Sample size = 6,977)

	Ever worked in term time	Ever worked in vacations	Ever worked in college
Overall percentage	**62.74%**	**28.94%**	**78.12%**
Percentage by ranking level of institution			
985 institution	60.29%	30.78%	75.42%
211 but not 985 institution	59.99%	27.37%	74.27%
non-key institution	65.99%	30.02%	81.18%
Independent institution	47.31%	23.00%	65.14%
Percentage by concentration of institution			
Comprehensive institution	62.50%	31.52%	80.78%
Engineering-concentrated institution	52.55%	27.38%	70.81%
Institutions with others concentration	75.71%	29.25%	85.59%
Percentage by region of institution			
Municipality	62.06%	31.57%	79.01%
East	71.49%	31.71%	85.81%
Northeast	53.43%	16.72%	68.33%
Central	53.09%	29.32%	71.53%
West	71.69%	32.64%	83.75%
Percentage by campus location			
Urban area	64.04%	28.30%	78.33%
Suburban	60.14%	30.26%	77.69%

As shown in Table 4.1, the percentage of term-time working students varies across institutions. First, it varies across academic ranking levels of the institution. The percentage of term-time working students is 66% in non-key institutions, about 60% for “985” and “211” institutions, and 47.3% in independent institutions. Second, the percentages of term-time working students are different for institutions with different concentrations. There are more working students in institutions with specific academic concentrations (75.7%) than comprehensive colleges and universities (62.5%), expect for institutions concentrated in engineering which have the lowest percent of term-time working students (52.6%). Third, the percentage also varies across institution locations. As shown in the table, the percentage of working students is highest in institutions located in east and west part of China (around 71.5%), followed by institutions in the three municipalities (62.1%), and lowest in institutions in central and northeast part (around 53%). In addition, there are fewer term-time working students in suburban campuses than in urban campuses. About 64% of students who ever stayed in urban campus in large cities or in campuses in small-scale cities worked during term time, while 60.1% students who stayed in suburban campuses through out college ever worked in term time.

As for the incidence of off-term working, there are some patterns that worth noting. First, as mentioned above, the percentage of students working during vacations is on average less than one-third. This suggests that college students in general prefer to work during term time rather than in vacations. Second, “985” institutions and comprehensive institutions have the largest percentage of students working during vacations. But in term time, there are fewer working students in these institutions than non-key institutions and institutions with specific concentrations. As “985” institutions and comprehensive institutions are considered to be better institutions in China, this difference suggests that students in these high-quality institutions have a higher preference of working in vacations compared to students in other institutions. Third, there is a higher percentage of off-term working students in institutions located in suburban areas, comparing to institutions with urban campuses. This suggests that the reason that students in suburban campuses work less in term time is more likely to be related to the campus location than to students’ attitude toward working. There might be fewer job openings in suburban area and the opportunity cost of working in urban area might be high. Therefore students who want to work but cannot find a job in term time turn to work in vacations when they do not need to stay in school.

Statistics shown above suggests that working in term time is very popular among college students. However, most students work only for a short time. As shown in Table 4.2, students in the sample on average worked for 5.67 months during term time, which is about 2 to 3 weeks longer than the typical length of an academic semester in China. Looking at the distribution, about 33.4% of term-time working students worked for no more than 2 months, 60.8% of students worked for approximately one academic semester (5 months) or less. Only 15.6 % work for more than two semesters (9.5 months). This finding is consistent with previous studies which show that a large percent of term-time jobs are temporary jobs (T. Li, 2011; Qian, 2011). However, the variance of the accumulated amount of months worked in term time is 5.91 months, which is greater than the mean. This suggests that there are some students who worked for an extremely large amount of months during term time. Among students with off-term working experience, the average length is about 1.82 months, indicating that students on average worked only for one or two vacations. Overall, the average accumulated amount of months worked during college is 6.35, or about half a year. Though the variance is large, most students worked for less than one year in college. Specifically, 33% of working students work only for two months or less during the four years in college, about 79% work for one year (12 months) or less, 9% work for one to two years, and 3.3% work for more than two years (24 months).

Though most students in the sample did not work for a long period during term time, they worked very intensively when they had jobs. On average, they worked for about 22.7 hours per week during term time and 27.6 hours per week during vacations. This is heavy workload according to the conventional standard in the U.S. studies. As shown in Table 4.2, about 11.3% of students with term-time working experience worked for 5 hours or less per week, about 20% worked for 5 to 10 hours per week, and about 12% worked for 10 to 20 hours per week. This means that students with moderate workload account only for about 43.3% of all students with term-time working experience. About 16.1% of students worked for 20 to 30 hours per week, 18.2% worked 30 to 40 hours per week, and 10% of students worked for even more than 40 hours per week.

Comparing with previous studies, students in this sample spend more hours on working during term time. Most previous studies found that students worked less than 10 hours per week. For instance, Qian's (2011) survey study in 6 institutions in Henan province found that 31% of working students worked less than 5 hours per week during term time, and 40.6% worked less than 10 hours per week. Only 13.6% worked more than 15 hours per week (Qian, 2011). Chen et.al.'s (2005) in 3 institutions in Nanjing and Bao et.al's (2010) study in one institution in Inner Mongolia both found that about 70% of working students worked less than 20 hours per month during term time, which could be transformed to 4 to 5 hours per week (Bao et al., 2010; Chen et al., 2005). A possible reason for this difference might be that the samples of previous studies contained students from every grade in college, while the sample here contains only the fourth-grade students. As students in earlier years in college have relatively heavier course load than those in senior years, they may not be able to spend too much time on working. Previous studies did revealed a trend that as students getting into senior years, more students worked and worked more during term time (Chen et al., 2005; Jun Li & Ma, 1999; L. Zhang, 2009; Zhao & Hao, 2010; Zhou & Chen, 2010). This study finds the same trend. The average hours spent on term-time working per week in the first year in college is 14 hours, and it is 16.7 hours in the second year, 20.6 hours in the third year, and 24.8 hours in the fourth year. However, even in early years in college, students in this sample still spend more time on working per week during the term time than students in previous studies. This implies that term-time working becomes an increasingly significant part of students' college experience in recent years.

With regards to the forms of job, internship and part-time jobs are more popular than work-study jobs. During term time, 58.5% of the working students ever took internships, 56% took part-time jobs, and 31.8% took work-study positions. In addition, about 28.6% of students worked in two forms of jobs, and about 9% worked in all three forms of job. This is consistent with the finding in Z. Jing, Lv, and Sun (2010) that many working students have multiple working experiences. In vacations, 85.8% of working students worked only once. Internship is still the most popular form of job. 53.2% of students who ever worked during vacations took internship, 48% took part-time jobs, and 14.6% took work-study job. Overall, about 69.5% of working students in the sample have internship experience, 67.7% have part-time working experience, and 37.4% have work-study experience. About 39% of students ever work in two forms of job, and about 17.8% have all three forms of working experience. The less popularity of work-study jobs might be due to the fact that work-study positions are usually only available to low-income students.

For another thing, the form of in-college working changes across grades in college. About 76% of work-study jobs and 65% of part-time jobs were taken in the first two years, and about 79% of internships were taken in the last two years. As internships are generally more demanding and major-relevant than work-study and part-time jobs, such a trend implies a shift from low-skilled jobs to high-skilled jobs as students getting further in college. This finding is consistent with previous studies which found that students in junior and senior years were more likely to take high-skilled and major-relevant jobs than students in lower grade (B. Chu et al., 2010).

As for the types of job during college, the information is only available for the most recent working experience. Among students whose most recent working experience is during term time, the most popular type of job is office clerk such as assistants and administrative staffs (18.4%), followed by tech-intensive professional jobs such as engineers, designers, and interpreters (16.3%), sales (12.3%), educational jobs such as teachers for after-school classes and for private academic training centers (11.1%), service-type jobs (9.3%), private tutors (7.64%), and labor-intensive jobs such as manual workers (7.58%). Comparing with previous study, the percentage of students taking low-skill jobs is smaller in this sample. Previous studies found that at least more than half of working students took labor-intensive and low-skill jobs such as sales, waiters, and manual workers (Chen et al., 2005; S. Jing et al., 2005; Guanghong Li & Hu, 2003; Mi, 2004; X. Wang & Li, 2008), whereas the percentage of this sample is about 30 %. In addition, the percentage of students working as private tutors ranges from about 10% to 70% in previous studies with an average around 40%, whereas it is only 7.6% in this sample. These differences can again be explained by the different composition of the samples. As students in this sample took the survey in the last year of college, about 86% of their most recent term-time jobs were during junior and senior years, and 48% were in the form of internships. Therefore it is not a surprise that the percentage of students taking high-skill jobs in this sample is higher than the percentage in other samples of pervious studies.

In summary, descriptive statistics suggest that the majority of students in this sample worked at some point in term time. They on average spent about 23 hours per week on working and worked for about half a year. Internships and part-time jobs are more popular among these students than work-study jobs. Many students have multiple working experiences in different forms.

Table 4.2 Characteristics of in-college working experience in China (Sample size = 6,977)

Variable	Variable name	Mean / percentage	Std. Dev.	Missing rate (%)
Panel 1. Overall In-college working experience				
Ever worked in high school (Yes=1) (%)	hswork	3.05		0.00
Ever worked in college (Yes=1) (%)	worked	78.12		2.26
Total months worked in college (% of working students)	totaldr	6.35	7.33	7.96
<=2 months		33.24		
2~6 months		30.13		
6~12 months		15.73		
12~24 months		8.99		
>24 months		3.30		
Average hours worked per week	avehr	23.33	15.56	15.54
Total days worked in college (constructed)	totaldy	71.30	96.09	17.33
Form of in-college working experience (% of working student)	typenum			0.07
Work-study only		6.23		
Part-time only		16.18		
Internship only		20.76		
Work-study and Part-time		8.06		
Work-study and internship		5.24		
Part-time and internship		25.60		
All three forms		17.84		
Panel 2. Term-time working exeprience				
Ever worked during term time (Yes=1) (%)	termtime	62.74		10.28
Total months worked during term time (% of term-time working students)	ttdr	5.67	5.91	5.13

<=2 months		33.38		
2~5 months (1 academic term)		27.44		
5~9.5 months (1 academic year)		18.08		
9.5~19 months (1~2 academic years)		12.14		
19~38 months (2~4 academic years		3.47		
Average hours worked per week in term time (% of term-time working students)	tthr	22.71	15.53	11.22
0.1~5hr		11.25		
5.1~10hr		20.08		
10.1~20hr		12.03		
20.1~30hr		16.13		
30.1~40hr		18.20		
more than 40hr		10.24		
Total days worked in term time (constructed)	ttday	61.77	75.82	13.89
Form of term-time working experience (% of term-time working students)	ttnum			0.21
Work-study only		11.55		
Part-time only		22.99		
Internship only		27.49		
Work-study and Part-time		6.54		
Work-study and internship		4.73		
Part-time and internship		17.31		
All three forms		9.02		
Types of the most recent term-time working (% of students whose most recent in-college woring experience was during term time)	ttjobtype			16.66
labor-intensive jobs		7.58		
service-type jobs		9.31		
sales		12.28		
private tutoring		7.64		
education & training		11.10		
office staff		18.43		
professional job		16.26		
Panel 3. Off-term working experience				
Ever worked during vacations (Yes=1) (%)	offterm	28.94		10.29
Total months worked during vacations	offdr	1.82	1.33	3.33
Average hours worked per week in vacations	offhr	27.61	17.19	18.74
Total days worked in vacations (constructed)	offday	24.98	25.74	20.03
Form of off-term working experience (% of those worked in vacations)	offnum			0.10
Work-study only		8.67		
Part-time only		35.56		
Internship only		41.58		
Work-study and Part-time		2.60		
Work-study and internship		1.88		

Part-time and internship		8.29	
All three forms		1.40	
Types of the most recent off-term working (% of students whose most recent in-college working experience was during vacations)	offjobtype		11.74
labor-intensive jobs		10.30	
service-type jobs		12.43	
sales		13.38	
private tutoring		7.44	
education & training		4.36	
office staff		21.46	
professional job		18.57	

4.2 Comparison between working and non-working students

Students who work during term time are different from those who do not. Table 4.3 presents a comparison of the means of key variables between working and non-working students. In order to incorporate sampling weights, Wald tests instead of T-tests are implemented to identify the significance level of the difference between group means. Panel 1 in Table 4.3 compares students who worked during term time with those who never worked during term time. Panel 2 compares students who worked at some point in college with those who never worked during college.

As shown in the table, students who worked during term time have significantly different background from those who did not work during term time. Term-time working students are on average older than non-term-time-working students, more likely to be female, more likely to be from rural area, and less likely to be the only child in their family. They are more likely to be from a family with less annual household income and lower SES score. In addition, the average NCEE score of term-time working students are lower than non-term-time-working students. These differences are statistically significant, indicating that students who work in term time are from disadvantaged family and academic background.

The comparison between students who worked at some point in college and who never worked in college reveals the same differences.

Table 4.3 Comparison between working and non-working students (weighted)

	Panel 1. Term-time working				Panel 2. In-college working			
Variable		**Mean**	**No. of obs**	**F-stat for Adjusted Wald test**		**Mean**	**No. of obs.**	**F-stat for Adjusted Wald test**
Age	Yes	23.06	6,153	18.42***	Yes	23.03	6,679	15.66***
	No	22.87			No	22.85		
Female	Yes	0.53	6,232	76.76***	Yes	0.51	6,787	48.97***
	No	0.35			No	0.35		
Minority	Yes	0.05	6,208	5.37*	Yes	0.05	6,755	3.64+
	No	0.07			No	0.07		
Single child	Yes	0.31	6,201	87.60***	Yes	0.33	6,747	85.94***
	No	0.51			No	0.54		
No. of siblings	Yes	1.05	6,067	74.92***	Yes	1.02	6,592	78.35***
	No	0.68			No	0.63		
From municipalities	Yes	0.09	6,105	0.39	Yes	0.09	6,627	0.58
	No	0.08			No	0.08		
From central or west area	Yes	0.48	6,105	0.46	Yes	0.48	6,627	0.19
	No	0.49			No	0.47		
From rural area	Yes	0.49	6,247	57.67***	Yes	0.47	6,802	57.99***
	No	0.33			No	0.3		
Annual household income	Yes	44567.05	5,273	18.49***	Yes	45460.56	5,607	15.12***
	No	52959.78			No	53646.43		
Mother's years of schooling	Yes	9.05	5,794	27.00***	Yes	9.16	6,217	24.50***
	No	10.06			No	10.19		
SES score	Yes	-0.25	5,047	55.00***	Yes	-0.21	5,339	42.62***
	No	0.1			No	0.11		
Leader in high school	Yes	0.43	6,259	4.17*	Yes	0.43	6,818	4.43*
	No	0.39			No	0.38		
NCEE score	Yes	70.16	5,638	15.65***	Yes	70.29	6,024	6.10*
	No	71.48			No	71.23		
Worked in high school	Yes	0.03	6,259	0.46	Yes	0.03	6,818	2.05
	No	0.04			No	0.04		
Major	Yes	2.9	6,255	13.50***	Yes	2.91	6,810	6.23*
	No	3.06			No	3.03		
Preference degree of one's major	Yes	2.68	6,172	0.01	Yes	2.67	6,697	0.03
	No	2.68			No	2.66		
Hours spent per week on studying after class	Yes	13.77	5,036	3.2+	Yes	13.58	5,339	1.89
	No	12.94			No	12.86		

English	Yes	2.13	6,118	0.12	Yes	2.14	6,648	0.17
	No	2.12			No	2.13		
Leader in student organizations	Yes	0.23	6,260	2.78+	Yes	0.23	6,819	9.48**
	No	0.19			No	0.18		
CCP member	Yes	0.32	6,211	5.15*	Yes	0.31	6,758	6.74**
	No	0.28			No	0.26		
Had professional certificates	Yes	0.47	6,260	3.47+	Yes	0.46	6,819	1.91
	No	0.43			No	0.43		
Tuition (sticker price)	Yes	5395.47	6,259	17.35***	Yes	5518.61	6,817	8.78**
	No	6001.74			No	5976.88		
Fund from family	Yes	9055.1	5,338	18.95***	Yes	9176.27	5,648	14.69***
	No	10302.85			No	10389.88		
Total amount of financial aid	Yes	2335.39	3,175	3.03	Yes	2283.4	3,339	0.25
	No	2043.86			No	2172.08		
Had merit aid	Yes	0.4	6,260	48.22***	Yes	0.38	6,819	59.03***
	No	0.26			No	0.23		
Had need aid	Yes	0.27	6,260	67.94***	Yes	0.25	6,819	99.98***
	No	0.12			No	0.09		
Had loan	Yes	0.33	6,184	51.96***	Yes	0.32	6,712	76.34***
	No	0.19			No	0.16		
Average score in college	Yes	79.8	5,053	2.99+	Yes	79.67	5,367	0.74
	No	79.17			No	79.3		
Had an offer by graduation	Yes	0.69	4,494	17.50***	Yes	0.69	4,917	27.39***
	No	0.59			No	0.54		
Wage	Yes	2354.61	2,953	5.38*	Yes	2351.78	3,146	7.98**
	No	2502.63			No	2563.97		

(+ p<0.1, * p<0.05, ** p<0.01, *** p<0.00)

With regards to college experience, students with term-time working experience perform at least as well as those who did not worked in term time. They have similar average scores in college and similar level of English proficiency, implying that term-time working do not influence students' academic performance. Looking at hours spent per week on studying after class, students who work during term time actually spend more hours on reviewing than students who do not work in term time, thought the gap is less than 1 hour and only marginal statistically significant (p<0.1). This suggests that term-time working does not reduce students' studying time. In addition, there is a statistically significantly larger percent of CCP members among term-time working students than among non-term-time-working students. The percentage of students with merit-based scholarships is also statistically significantly higher among term-time working students. As merit-based scholarships in most universities in China are granted based on scores in Comprehensive Quality Assessment, this higher percentage suggested that term-time working students overall perform better than non-term-time-working students in college. The differences in these aspects remain statistically significant when comparing students who worked at some point in college to those who never worked. In addition, it reveals that there is a significantly larger percent of student leaders among students who ever worked in college. This suggests that students who are more actively involved in student activities are more likely to work. The percentage of student leaders is also higher among term-time working students, but only marginal statistically significant ($p<0.1$). This may because being a student leader requires more time commitment during term time. Therefore some of them work in vacations instead of in term time.

As for post-college labor market performance, students with term-time working experience are statistically significantly more likely to get an offer by the time of survey than those who did not work in term time. Yet among those who get an offer, the average starting salary for students who worked in term time are statistically significantly lower than those who did not work. The same differences are found between students who worked at some point in college and those who never worked in college. It suggests that working in term time and in college may make it easier for students to get a job, but may not be helpful in getting a higher-paid job.

In summary, the basic comparison reveals that students who worked in term time are more likely to be from disadvantaged background. Working during term time may not be harmful to students' academic performance and may be able to help them to find a job after college. The comparison also provides some evidence of positive self-selection. Students who worked during college and during term time are more likely to be those who work harder and more actively involved in college life. This signifies the necessity of addressing the endogeneity problem in further analysis.

4.3 Factors influencing term-time working behavior

This section explores factors that influence students' term-time and in-college working behavior with quantitative methods. The working behavior is measured by participation (i.e. whether worked), length (i.e. total amount of months worked), intensity (i.e. average hours worked per week), and total amount (i.e. accumulated full-time equivalent working days). As described in the conceptual framework, students' decision on in-college working is influenced by many factors. The aim of this section is not to model the decision making process, but to examine the associations between students' working behavior and potential influencing factors as suggested by theories. The estimated coefficients of each variable presented in Table 4.4 cannot be interpreted as causal impacts of these factors.

Scott-Clayton's (2012) modified model based on human capital theory, as discussed in Section 3.2.1.1, suggests that a student's decision on whether and how much to work in college may be influenced by three categories of factors. The first is individual level factors including individual's ability, financial constraint faced in college, and expected human capital gains from studying and working (i.e. expected rates of return to educational attainment and to in-college working experience). These factors are related to the two primary reasons of term-time working revealed by previous empirical studies, which are to meet financial need and to accumulate work-related human capital. The second is the job market characteristics around the student while he or she is in college, including the amount, types, and wage level of available jobs. These factors describe the options available to students when they make the time allocation decision. The third category is institutional characteristics that influence the quality of schooling provided by the institution. Students may turn to work in order to get human capital of higher quality when they are not satisfied with college education.

Unfortunately, the CSLM 2011 data does not provide information on all of these aspects. For instance, no information was collected about the jobs that were available to students when they made the working decision. In the questionnaire, students were asked to report their income from each piece of working experience and the type of job (i.e. sales, tutors, office clerks, etc.) for the most recent working experience. But these kinds of information are all post-decision characteristics that are not proper to be included in the analysis. There also lacks a direct measure of job availability. As most jobs taken by college students are temporary and short-term jobs, local unemployment rate may not be a good measure of job availability. Instead, this study controls for the region where the institution located and campus location as indirect measures of job availability. In addition, there is no measure of the labor market rates of return to education or to working experience, nor for students' expectation of these rates. The CSLM survey asked students about their expected monthly salary; however, this is a combined expectation of return to the overall college experience. It is also a piece of post-decision information as working in college may alter students' expectations of future employment (Z. Jing et al., 2010; S. Zhu, 2010).

As for other aspects, student's ability is measured by NCEE score and whether the student was a leader in high school. Students' motivation and attitude towards studying is captured by the degree of preference of one's academic major and time spent on studying after class. Whether a student worked in high school is included to capture the student's attitude towards working. Students' credit constraint is measured by the sticker price of tuition, amount of family fund, total amount of financial aid, and types of financial aid (i.e. merit-based aid, need-based aid, and loans). At the institution level, the academic ranking level and concentration of the institution are included besides region and campus location. The percentages of working and term-time working students in each institution in the original sample (i.e. the sample with 8,179 students in both Cohort 2007 and other cohorts) are also included as a measure of the common attitude towards in-college and term-time working in each institution. In addition, the percentage of low-SES students in the original sample of each institution is included.[17] As work-study is one of the most common types of financial aid to students in need, it is likely that institutions with more low-SES students have more work-study positions available and therefore have more working students than other institutions. On the other hand, however, it is also possible that low-SES students tend to attend institutions that charge lower tuition and/or locate in cities with lower living costs, so that they would have less financial burden and do not need to work a lot during college. In either case, including the percentage of low-SES students may control for some institutional level impact on students' participation in in-college and term-time working.

[17] Low-SES students are defined as students in the lowest quartile of the distribution of the composited SES score in the original sample (obs.=8,179).

Finally, the covariates set (X_i) specified in Section 3.3.2.1 is included, including students' individual characteristics, family background, and college experience such as major, whether has a minor, CCP membership, and whether takes leadership positions in departmental and/or institutional level student organization.

Table 4.4 presents the regression results. The dependent variables in Panel 1 are measures of term-time working behaviors and the dependent variables in Panel 2 are measures of overall in-college working experience. Model (1) and Model (5), in which the dependent variable is participation in term-time working and in-college working respectively, are estimated with probit regression, and marginal effects are reported in the table for interpretation simplicity. Other models are estimated with OLS regression, as the dependent variables are continuous. Sampling weight is applied in all regressions.

The marginal effects for Models (1) in the table represent the changes in the probability of working during term time according to changes in explanatory variables. With regards to the influence of students' ability, holding other things constant, being a student leader in high school is statistically significantly associated with an increase in the probability of working during term time by 3.66 percentage point respectively; while one standard deviation increase in NCEE score (7.88 points for the rescaled NCEE score) is associated with a decrease a decrease in the probability of working during term time by 5.26 percentage point. As being a student leader in high school and NCEE scores measure different aspects of ability, this results suggest that students with higher academic ability are less likely to work in term time, while students with higher non-cognitive skills are more likely to work in term time. With regards to students' motivation, none of the attitude measures, i.e. preference degree of one's academic major, hours spent per week on studying after class, and whether the student worked during college, significantly influence students' term-time working participation. This suggests that negative attitude towards studying is not a reason for students to work in term time. Model (5) founds the same associations between participation in overall in-college working and these ability and attitude variables. Students with higher NCEE score are less likely to work in college, while senior high school student leaders are more likely to work in college. The marginal effects of the attitude variables are all statistically insignificant.

Among the measures of credit constraint, tuition charged by institution, amount of family fund, and amount of financial aid do not show any significant association with the likelihood of working during term time or during college. But having need-based aid is significantly associated with an increase in the probability of working in college by about 5 percentage point, though it does not significantly influence the probability of working during term time. In addition, the probability of working in term time is about 9.1 percentage points greater for students with loans than that for students without loans, and the probability of working in college is about 8.6 percentage points higher for students with loans. As having need-based aid and loans indicates a lack of funding, this result suggests that students with higher financial need are more likely to work in term time and in college. Providing need-based financial aid instead of loans to these students may reduce participation in term-time working.

These results can be explained on the theoretical ground. Having need-based financial aid and/or loans indicates that the student is under a "strict" credit constraint, i.e. he or she lacks of fund to meet the direct costs of attending college which consists of tuition, fees, and basic living expenses (Scott-Clayton, 2012). For these students, though tuition may not be a concern because it is covered by their financial aid and loans, they still need to make money to pay for basic living expenses. Therefore they have to work more in college. In addition, the insignificant association between family fund and term-time working participation suggest that this group of students face a "fuzzy" credit constraint which is related to discretionary living expenses (Scott-Clayton, 2012). Their working decision might be jointly influenced by the amount of family fund and their chosen consumption level, which is not measurable with available data. Therefore the absolute value of family fund shows no influence on students' working decisions.

As for institution characteristics, the academic ranking level and academic concentration of the institution are not statistically significantly associated with the probability of working in term time, or with the probability of working in college. With regards to institution location, attending institutions in central or west regions is significantly associated with a decrease of 7.5 percentage point in the probability of working during term time, compared to attending institutions in east region. But it has no significant association with the participation of in-college working. The campus location of campus does not influence the probability of term-time working and in-college working. Finally, the percentages of term-time working students are statistically significantly associated with higher probability of participation in term-time working, other things held constant. 1 percentage point increase in the proportion of term-time working students in the institution is associated with an increase of 0.65 percentage point in the probability for individual student to work during term time. This suggests that institution level attitude towards working has a strong influence on individual student's participation in in-college and term-time working. The percentage of low-SES students does not influence students' participation in term-time working.

As for other covariates, holding other things constant, female student and students from rural area is statistically significantly more likely to work during term time. Being minority and being the only child of one's family is associated with a statistically significant decrease in the probability of participation in term-time working. Student's age has no significant association with the probability of working during term time. Whether a student is from the central or west area and the SES score of his/her family do not have statistically significant influence on the probability of working during term time. With regards to college experience, students' academic major does not influence their term-time working participation, but students with an academic minor are statistically significantly more likely to work during term time. Being a CCP member is associated with a statistically significant decrease in the probability of working during term time. Being a student leader in college is not significantly associated with the probability of working during term time. The associations between these covariates and participation in overall in-college working are most the same, except for two college experience variables. Having an academic minor is not associated with the probability of working in college, while being a student leader in college is positively associated with this probability.

Model (2) to Model (4) estimate the associations between the explanatory variables and the length, intensity, and total amount of term-time working respectively. Students who did not work in term time are treated as having zero value in these variables. Models (6) to (8) estimate the associations with measures of in-college working experience. As shown in the table, being a student leader in high school is significantly positively associated with more months worked term time, but not significantly correlated with the intensity and total amount of term-time working. Students with higher NCEE score tend to spend fewer hours per week on term-time working and accumulate fewer full-time equivalent term-time working days. Whether worked in high school and students' degree of preference on their major do not influence the length, intensity, and total amount of term-time working. For in-college working, senior high school student leaders tend to work for more months and accumulate more full-time equivalent working days in college. But NCEE score is not associated with the length, intensity, and total amount of overall in-college working.

As for measures of credit constraint, the magnitude of coefficients on tuition, amount of family fund, and amount of financial aid are all very small, though some of the coefficients are statistically significant. This suggests that these variables do not have substantive influence on the length, intensity, and total amount of term-time working and in-college working. Merit-based and need-based financial aids do not have statistical significant associations with any of the working behavior measures as well. Having loan is significantly associated with more months and full-time equivalent days worked in term time and in college, but is not significantly associated with hours worked per week.

Table 4.4 Determinants of in-college and term-time working

Dependent variable	Panel 1. Term-time working				Panel 2. In-college working			
	(1) Participation	(2) Length	(3) Intensity	(4) Total amount	(5) Participation	(6) Length	(7) Intensity	(8) Total amount
	Marginal effect	b	b	b	Marginal effect	b	b	b
Student leader in senior high school	0.0366*	0.700**	0.491	4.814	0.0272*	1.019***	0.706	7.00*
	(0.0172)	(0.225)	(0.667)	(2.951)	(0.0132)	(0.281)	(0.672)	(3.698)
NCEE score (rescaled to 1~100)	-0.00668***	-0.0292+	-0.180***	-0.591**	-0.00409***	-0.0380+	-0.0799	-0.412
	(0.00141)	(0.0158)	(0.0528)	(0.213)	(0.00108)	(0.0201)	(0.0523)	(0.283)
Worked in high school	-0.0446	-0.492	-1.289	-0.0310	-0.0997+	-0.388	-0.166	1.136
	(0.0569)	(0.487)	(1.797)	(7.198)	(0.0542)	(0.656)	(1.950)	(9.236)
Preference degree of one's major	-0.0168	-0.155	-0.345	-1.302	-0.00634	-0.148	-0.276	-0.391
	(0.0105)	(0.121)	(0.405)	(1.730)	(0.00788)	(0.166)	(0.399)	(2.101)
Hours spent per week on studying after class	8.80E-04	0.0175	-0.0460	-0.141	4.66E-04	0.0185	-0.00252	0.0135
	(8.09E-04)	(0.0144)	(0.0305)	(0.132)	-6.43E-04	(0.0167)	(0.0340)	(0.195)
Tuition (sticker price)	2.87E-07	6.30E-06	1.85E-04	7.92E-04	1.10E-06	-5.72E-05	2.81E-04+	5.55E-04
	(3.70E-06)	(3.85E-05)	(1.53E-04)	(6.59E-04)	(2.86E-06)	(4.69E-05)	(1.48E-04)	(7.75E-04)
Fund from family	9.77E-07	-1.86E-05	1.09E-04	3.96E-05	1.29E-06	-1.92E-05	1.62E-04*	1.29E-04
	(1.73E-06)	(1.88E-05)	(7.01E-05)	(2.76E-04)	(1.35E-06)	(2.33E-05)	(6.89E-05)	(3.13E-04)
Amount of financial aid	8.44E-06	1.99E-04**	-2.71E-04	0.00144+	3.57E-07	2.28E-04*	-4.81E-04**	0.00112
	(6.21E-06)	(7.41E-05)	(1.70E-04)	(8.38E-04)	(4.76E-06)	(9.52E-05)	(1.77E-04)	(0.00109)
Have merit-based aid	0.0245	0.241	1.234	4.774	0.0308	0.0743	1.028	2.770
	(0.0296)	(0.355)	(1.081)	(4.397)	(0.0236)	(0.453)	(0.988)	(5.728)
Have need-based aid	0.0238	0.739+	0.833	7.574	0.0494*	0.782	1.597	7.738
	(0.0286)	(0.424)	(1.061)	(5.019)	(0.0213)	(0.555)	(1.104)	(6.724)

Have loan	0.0910***	1.178***	0.138	7.544*	0.0860***	1.640***	0.538	15.09**
	(0.0200)	(0.292)	(0.770)	(3.393)	(0.0144)	(0.360)	(0.785)	(4.626)
Age	0.0110	0.256*	0.159	2.788+	0.0110	0.376**	0.0214	4.346*
	(0.00868)	(0.109)	(0.335)	(1.568)	(0.00669)	(0.135)	(0.350)	(1.977)
Female	0.0864***	0.635**	2.357***	8.465*	0.0542***	0.785**	1.470*	11.78**
	(0.0173)	(0.242)	(0.702)	(3.286)	(0.0133)	(0.303)	(0.696)	(4.247)
Minority	-0.0925*	-0.938***	-1.229	-8.878*	-0.0610*	-1.318***	-0.754	-10.72*
	(0.0359)	(0.245)	(1.355)	(3.868)	(0.0294)	(0.307)	(1.332)	(4.868)
From municipalities	0.000157	0.181	3.143+	7.691	-0.0118	0.497	3.118+	19.27**
	(0.0384)	(0.363)	(1.664)	(5.868)	(0.0286)	(0.441)	(1.634)	(7.325)
From central or west area	0.0298	0.257	1.381	4.446	0.0247	0.542	1.451	11.38+
	(0.0227)	(0.274)	(0.942)	(4.343)	(0.0175)	(0.338)	(0.991)	(6.109)
From rural area	0.0621*	0.649*	1.178	4.609	0.0492*	0.458	1.357	1.473
	(0.0242)	(0.275)	(0.899)	(3.948)	(0.0193)	(0.349)	(0.925)	(5.545)
Single child	-0.0864***	-0.111	-1.798*	-0.163	-0.0647***	-0.0112	-1.469+	-1.812
	(0.0215)	(0.210)	(0.781)	(3.070)	(0.0169)	(0.281)	(0.800)	(3.912)
SES score	-0.0136	-0.342*	-0.145	-4.564*	-0.00468	-0.501**	0.0809	-6.769**
	(0.0122)	(0.133)	(0.446)	(1.820)	(0.00940)	(0.164)	(0.448)	(2.490)
Humanity track in high school	0.00648	-0.208	1.820+	1.882	0.00217	-0.202	1.779+	0.845
	(0.0279)	(0.308)	(1.086)	(4.353)	(0.0215)	(0.383)	(1.045)	(5.555)
Arts or athlete student in high school	-0.0401	-0.105	0.156	-0.356	-0.0648	0.398	0.232	9.423
	(0.0494)	(0.529)	(1.630)	(7.447)	(0.0435)	(0.659)	(1.612)	(9.173)
Science or Engineering major	-0.0408	0.0535	-0.261	6.010	-0.0241	-0.0484	0.401	7.915
	(0.0260)	(0.343)	(1.092)	(4.600)	(0.0203)	(0.426)	(1.056)	(5.856)
Economics or Management major	-0.0253	0.323	2.033+	9.402+	0.00693	0.372	3.791***	18.96**
	(0.0300)	(0.347)	(1.134)	(4.840)	(0.0217)	(0.425)	(1.114)	(6.380)
Have a minor	0.0702**	0.213	4.069***	8.165+	0.0375+	-0.136	3.552**	7.456
	(0.0261)	(0.348)	(1.225)	(4.422)	(0.0202)	(0.413)	(1.134)	(5.648)

Party member	-0.0587**	-0.243	-1.466+	-3.004	-0.0337*	0.00910	-1.244	-2.301
	(0.0208)	(0.259)	(0.797)	(3.291)	(0.0163)	(0.342)	(0.798)	(4.390)
Student leader	0.0330	-0.0153	0.159	0.830	0.0474**	-0.0752	0.537	-0.263
	(0.0208)	(0.241)	(0.789)	(3.321)	(0.0147)	(0.313)	(0.779)	(4.298)
Percentage of working students					0.00623***	0.0926***	0.179***	0.922***
					(0.000762)	(0.0130)	(0.0389)	(0.189)
Percentage of term-time working students	0.00651***	0.0699***	0.132***	0.631***				
	(0.000823)	(0.00972)	(0.0316)	(0.140)				
Percentage of low SES students	-0.00241+	-0.0725**	0.0912+	-0.143	-0.00194*	-0.0934**	0.0678	-0.314
	(0.00125)	(0.0239)	(0.0501)	(0.300)	(0.000946)	(0.0327)	(0.0529)	(0.416)
"985" institutions	-0.0248	-0.297	-0.768	-7.248+	-0.0253	-0.244	-1.841+	-10.10+
	(0.0285)	(0.358)	(1.031)	(4.193)	(0.0233)	(0.482)	(1.071)	(6.015)
"211" institutions	0.0159	0.889***	-1.727*	3.365	0.00886	1.275***	-2.060**	5.926+
	(0.0176)	(0.206)	(0.679)	(2.503)	(0.0140)	(0.258)	(0.716)	(3.366)
Independent institutions	-0.0572	-0.885+	-1.992	-11.56	-0.0314	-1.104+	-1.231	-13.29
	(0.0504)	(0.480)	(1.759)	(7.495)	(0.0381)	(0.646)	(1.941)	(9.873)
Comprehensive institutions	-0.0134	-0.0773	-0.0749	-3.668	-0.00563	-0.150	0.503	-3.914
	(0.0257)	(0.306)	(0.961)	(4.627)	(0.0207)	(0.432)	(0.969)	(6.332)
Engineering-concentrated institutions	-0.0474+	-0.304	-1.176	-8.883*	-0.0286	-0.486	-0.288	-8.947+
	(0.0246)	(0.273)	(0.925)	(3.849)	(0.0189)	(0.383)	(0.909)	(5.248)
Institution located in municipalities	-0.0109	-1.102**	2.092	-0.883	0.0102	-1.463**	2.114	-7.846
	(0.0328)	(0.422)	(1.297)	(5.519)	(0.0230)	(0.547)	(1.325)	(7.689)
Institution located in central or west area	-0.0750**	-0.706*	-1.811+	-8.845+	-0.0346+	-0.802+	-0.929	-13.04+
	(0.0262)	(0.344)	(1.081)	(4.926)	(0.0204)	(0.459)	(1.132)	(7.337)
Campus located in suburban	-0.0317+	-0.831***	1.426*	-6.174+	-0.0220	-1.033**	1.332+	-9.097+
	(0.0177)	(0.248)	(0.682)	(3.400)	(0.0139)	(0.350)	(0.730)	(5.100)
Constant		-2.182	13.96	13.96		-5.154	4.590	4.590
		(3.003)	(9.480)	(9.480)		(3.838)	(10.13)	(10.13)

N	6,261	6,040	5,780	5,666	6,817	6,391	5,985	5,889
R-sq		0.167	0.125	0.116		0.145	0.109	0.105
Adjusted R-sq		0.159	0.117	0.108		0.138	0.101	0.097
Pseudo R2	0.177				0.157			

Note: 1. Weights are applied and robust errors are in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. Missing dummies were included in regressions.

At the institution level, the percentage of term-time working students is statistically significantly and positively associated with all the measures of term-time working. The percentage of low-SES students has a slightly negative association with the total months worked during term time, but no association with the average hours worked per week. Students in "211" institutions tend to spend fewer hours on working per week compared to students in non-key institutions, but tend to work for longer months. So there is no significant difference in total amount of term-time working between students in these two types of institutions. Students in "985" institutions and independent colleges are not different from those in non-key institutions with regards to length, intensity, and total amount of term-time working. Institution's academic concentration is not significantly associated with the length and intensity of term-time working. But attending an engineering-concentrated institution is statistically significantly associated with a decrease in the total accumulated working days by about 9 days, compared to attending institutions with other concentrations. Institution location is significantly associated with the length of term-time working. Students attending institutions in the east area tend to work for more months in term time than those in the municipalities and the central and west area. But institution location does not influence the intensity and total amount of term-time working. Campus location also influences term-time working behavior. Staying in a sub-urban campus is significantly and negatively associated with the length of term-time working, but is significantly and positively associated with more hours worked per week. This suggests that students in sub-urban campuses work for shorter time in term time, but work more intensively when they have jobs. As for overall in-college working, the patterns are almost the same, except that some of the associations become less significant.

As for other covariates, students' age is statistically significantly correlated with more months worked in term time and in college. It is also significantly associated with more full-time equivalent working days accumulated in college. Being female is significantly associated with all measures of term-time and in-college working. Being a minority and from a family with higher SES score significantly are associated with fewer months and days worked in term time and in college, but are not associated with hours worked per week. Students who are the only child in their family tend to spend fewer hours per week on working in term time than students with siblings. But there is no statistically significant difference in the lengths and total amount of term-time and in-college working between students who are single child and who are not. As for college experience, academic major does not influence students' term-time working behavior. But students with an Economics or Management major tend to accumulate more full-time equivalent working days in college, suggesting that these students are more likely to work in vacations. Students with an academic minor tend to spend more hours on working per week. CCP membership and student leadership are not significantly associated with the length, intensity, and total amount of term-time and in-college working.

The results presented above are in general consistent with findings of prior studies. The only Chinese study that employs regression methods to explore the determinants of student working is conducted by Z. Jing et.al (2010). With a small sample of students majored in Marketing in a university in northeast China, they estimated the associations between some influential factors and part-time working participation, but did not differentiate whether the working was in term time or in vacations. The study found that students from rural area earned more from part-time working than students from urban area, which suggested that rural students worked more in college than urban students (Z. Jing et al., 2010). They also found that student leaders were more likely to take part-time jobs in college. The analysis here reveals the same correlations. In addition, Jing et.al (2010) found that female students worked slightly more frequently than male students, though the coefficient was only marginally significant. Compared with their findings, this study reveals a significant and positive association between being female and longer months and hours worked in college and term time. The two studies are consistent with regards to the sign of the association between gender and in-college work behavior.

There are also some similar patterns between the findings of this study and previous U.S. empirical studies. For instance, Kalenkoski and Pabilonia (2008) found that tuition price did not influence working hours of students in four-year colleges. DesJardins, et.al (2010) found that receiving a Gates scholarship, which is a merit-and-need based scholarship, significantly reduced hours spent on working during term time. Titus (2010) found that students with lower SAT/ACT scores worked more hours in the first year of college.

In summary, the quantitative analysis finds that students' term-time working behavior is influenced by their ability, financial need, and institution they attend. Students with higher non-cognitive ability and higher financial need are more likely to work and work more in term time. Their attitude towards studying does not influence their working behavior. In addition, there is a significant peer effect on students' working behavior. Students in institutions with higher percentage of working students are more likely to work and tend to work more.

However, because of data limitation, the quantitative analysis in this study is not able to examine other motives of students' working behavior suggested by the theory and previous studies. The R-squares of the regression are about 0.10 to 0.176, indicating that some influential factors are missing from the model. For instance, previous survey studies find that the most important reason for students to work in college is to gain social and working experience (Cheng & Wang, 2010; B. Chu et al., 2010; S. Jing et al., 2005; Jiaheng Li, 2007; T. Li, 2011; Z. Li & Ni, 2006; Ma, 2012; Qian, 2011; S. Wang, 2010; Yuan et al., 2009; M. Zhang & Wu, 2008; L. Zhu et al., 2009). Some studies also show that some students work in term time as a way to spend spare time (B. Chu et al., 2010; S. Jing et al., 2005; L. Li et al., 2011; Ma, 2012; S. Wang, 2010; M. Zhang & Wu, 2008). Some other studies suggest that students' working behavior may be influenced by parents' attitude (Z. Jing et al., 2010; Jun Li & Ma, 1999). Yet these motives cannot be measured and controlled for with available data.

Failing to control for these motivations may induce self-selection bias in further analyses of the impact of term-time working. The regression results presented in this section show that students who work in term time are more likely to be female, from rural area, have more siblings and higher financial need, and perform worse in NCEE exam, a group of people who are more likely to be in a disadvantaged position in the labor market. It is very likely that they work in college because they want to improve their competitiveness in job searching. With such a motivation, they work hard in every aspect in college. As shown by the regression results, term-time working students are more likely to have an academic minor, which suggests from another respective that they want to learn more knowledge and skills. The regressions also show that there is no significant difference in hours spent on reviewing after class between term-time and non term-time working students, suggesting that working does not reduce students' efforts on studying. These results together suggest a hypothesis that those who are more likely to work in term time are students who are originally less likely to get a job after graduation (i.e. less capable) but willing to improve their competitiveness through hard work in college (i.e. more motivated). If this is true, there will be a negative self-selection with regards to labor market outcomes and a positive self-selection with regards to academic performance. The OLS will underestimate the positive impact of term-time working on labor market outcomes (i.e. the OLS estimate may be downward biased) and underestimate the negative impact of term-time working on academic performance (i.e. the OLS estimate may be upward biased).

4.4 Qualitative findings: the jobs and the reasons

The quantitative analysis in above sections provides some evidence of the characteristics of jobs taken by college students during term time, and reveals some factors that influence students' term-time working decisions. Yet, the quantitative data is not able to show why students work and what they do at work. Interviews with working students provide a source of data to learn about their jobs and incentives in details. This section answers two questions: 1. What jobs do students take in term time? 2. What are the reasons for students to work in term time?

4.4.1 Working experience of students in the qualitative sample

As described in Section 3.4.2.2, the interview sample contains 18 students from two institutions. As shown in Table 3.6, all of the interviewees have some in-college working experience, but one does not have term-time working experience. In addition, all interviewees but one have more than one piece of in-college working experience. The jobs taken by the interviewees in term time cover all three forms of jobs as identified in this study: work-study jobs, part-time jobs, and internships. This section summarizes the working experiences of the interviewees.

Work-study jobs

Work-study jobs are the least popular form among students in the interview sample, similar to the quantitative findings. Only six interviewees have ever taken work-study jobs, and five of them are from the "985" institution where there is a well-established Work-Study system accessible to all students in the institution. Three students took the work-study job in term-time, and three (including the one from the non-key institution) took it in vacations. Most of the jobs are not intensive in term-time, requiring about five to eight hours per week. But some jobs in vacations are full-time jobs requiring eight hours per day and five days per week.

The work-study positions taken by students in this sample were all service type jobs, such as librarians, student dorm assistants, campus securities, and office boys. According to the students, these were labor-intensive and low-skilled jobs. For instance, the major task for as librarians was to place the books back to the shelves; and the major task for dorm assistant was to check the sanitary and patrol records of the dorm regularly. Students found these jobs to be "boring", "physically exhausting", and overall "not worth the time". These are also the reasons mentioned by some students who did not choose to do work-study jobs. The wage of these jobs was also relatively low. It was about 13~15 RMB (about 2.0-2.50 US dollars) per hour in the "985" institution, and about 9~10 RMB per hour in the non-key institution.

Part-time jobs

Part-time job is the most popular form of working among the interviewees. Half of the interviewees from the "985" institution took part-time jobs in term time, and another two took part-time jobs in vacations. All employees from the non-key institution have ever taken some types of part-time jobs in term time. The jobs are of various types. Some are knowledge-based and/or major-related jobs, and some are labor intensive and low-skill jobs.

The most popular type of term-time part-time jobs is private tutoring. Eight interviewees have ever worked as private tutors for elementary and secondary school students in term time. The job is knowledge-based, but is not demanding, as college students are all "winners" in the NCEE exam. The length of private tutoring job varies from case to case. Some interviewees just worked for several months with only one student. Some took it as their major part-time job in college and tutored different students through the years. The intensity and wage also varied a lot. Tutors for elementary school students in general worked for 2 to 4 hours per week, while some tutors for senior high school students worked for 8 to 10 hours per week. The wage varied by students' grade and location, ranging from 15 RMB Yuan per hour for tutors for elementary school student in City B (the small city where the non-key institution locates) to 40 RMB Yuan per hour for tutors for high school students in City A (the municipality where the "985" institution locates).

Besides private tutoring, some interviewees also worked as class teachers or student mentors in term time. For instance, an interviewee from the non-key institution worked as a class tutor for elementary school students for a year. Her major responsibility was to help students with school assignments and teach remedial class in the weekend. Some interviewees majored in English Literature also worked as English tutors for private tutoring centers. In vacations, several interviewees from the "985" institution worked as student mentor for summer camps, while several interviewees organized summer tutoring camp for local students in their hometown. The responsibility of these jobs goes beyond teaching. They also need to organize other activities and take care of the students. These are full-time jobs that typically last for about one month in the summer.

In addition to educational jobs, some students also took major-related odd jobs in term time. For instance, an interviewee majoring in Industrial Design from the "985" institution took designing works in term time. Another interviewee majoring in Chinese Literature from the non-key institution wrote articles for newspapers and magazines. And an interviewee majoring in English Literature from the "985" institution said that many of her classmates took translation and/or interpreter jobs. According to them, these odd jobs were well paid and flexible in terms of schedule and workplace. Therefore many of their classmates preferred to take this kind of jobs. Among labor-intensive jobs, the most popular one is sales. Some students worked as the on-campus sales representative for a company, and some worked as sales promotion people in stores or malls. On-campus sales representative jobs are usually formal and contracted jobs that last for one semester or more, while sales promotion jobs are usually informal and temporary jobs. Both interviewees from the "985" institution and the non-key institution worked as on-campus sales representatives; but only some female interviewees from the non-key institution worked as sales promotion people. Besides sales, some interviewees from the non-key institution also worked as waiters/waitresses in restaurants or flyer distributors. These are very low-paid jobs. None of the interviewees from the "985" institution took these kinds of jobs.

Internships

Internship is the most popular form of job among interviewees from the "985" institution. All of the eight students have internship experiences during college, and half of them have more than one piece of internships. Six students took internships in term time. Most of the internships were taken before the senior year. Some even started in the first two years in college. Among the ten interviewees from the non-key institution, five have internship experience, but none of them has taken more than one piece of internship. Four of the internships were taken in term time, but were all during the last semester in college. In addition, most interviewees from the "985" institution got their internships through a formal application process; while most interviewees from the non-key institution either took the internship arranged by the institution or got the opportunity from their acquaintances. There is one interviewee in each institution that got an internship from their professors' recommendation.

As for the job content, all the internships were knowledge and skill based jobs such as project assistant, assistant designer, and assistant journalist. Students were involved in the core businesses of the company. Some had opportunities to be in charge of independent projects. The internships lasted for one to five months. Most of the jobs required full-time attendance during vacations, and two to three full working days per week during term time. The payment varied by jobs. Two interviewees from the non-key institution took non-paid internships.

Overall, there appears to be an institutional difference in taking internships. Interviewees from the "985" institution were more actively involved in internships than interviewees from the non-key institution. They started earlier and took more pieces of internships. There are two possible explanations to this institutional difference. The first is related to the location of the institutions. According to the interviewees, there are very few major-related internships available in City B than in City A. Therefore students in the non-key institution do not have many opportunities to take internships in term time until the last semester of the senior year when they have finished all the course work and are able to leave the campus. Second, the institutional difference in internship behavior may reflect a difference in the perception of job market returns to the internship experience, as suggested by Scott-Clayton's (2007) model. Students from the "985" institution may attach more value to internships than students from the non-key institution and therefore are more active in seeking of internship opportunities. This point is supported by findings on student motivations presented in next section.

In summary, students in the interview sample took various types of jobs, including service-type work-study jobs such as librarians and office boys, part-time jobs such as private tutors and sales, and major-related internships provided by companies. According to previous survey studies and the CSLM 2011 data, the jobs taken by interviewees in this sample are common among all working college students, suggesting that the working experiences of the interviewees have some representativeness. The data also shows that there is an institutional difference in the types of job taken by students. Interviewees from the “985” institution took more work-study jobs and internships but fewer part-time jobs, especially low-skill part-time jobs than interviewees from the non-key institution. This may because there are more work-study and internship opportunities in the “985” institution. Though the interview sample is not representative, it suggests that job availability influences students’ working decisions. The CSLM 2011 data also shows that there are more students taking internships than part-time jobs in “985” institutions in municipalities, whereas students in non-key institutions in small cities took more part-time jobs than internships.

4.4.2 Reasons of term-time working

According to previous theoretical and empirical studies, there are two major reasons for students to work in college. The first one is to get monetary compensation. Students have to work if they do not have enough funding to cover the basic costs of college attendance (i.e. under the “strict credit constraint”), or they may choose to work in order to make extra money for discretionary consumption (i.e. under the “fuzzy credit constraint”). The second one is to gain social and working experience. Some students work in order to learn about the world outside school; while some others work in order to gain practical skills and career-related experience that would benefit them in the job market after graduation. The analysis of the interview data reveals similar motivations. When talking about the reasons to work during term time, several key words appeared frequently in the interviews: “money” (15/17), “social experience” (9/17), “self-improvement" (9/17), "major and career-related practical skills (5/17), and "free time" (5/17). These words describe the motivations and incentives for students to work in term time during college.

<u>Monetary compensation</u>

Making money is the most frequently mentioned incentive for college students to work in term time. Fifteen out of the seventeen interviewees who have term-time working experience brought up monetary compensation when talking about why they worked in term time. For some students, it is their only or the most important incentive to start working. A student who worked as a private tutor since the sophomore year said:

> *"At the beginning, I started to work in order to make some money. I did not think about improving myself through working. I worked purely for money."*
>
> *—Ms. Wang from the non-key institution, majoring in Material Engineering*

Another student who took several part-time jobs emphasized that,

> *"I am very realistic. I will not take the job if they do not pay me."*
>
> *—Ms. Cong from the non-key institution, majoring in International Economics*

Some interviewees from the "985" institution also said that the initial reason for them to start working in college was to make some money.

However, none of the interviewees in the sample relied heavily on working to pay for nondiscretionary expenses of attending college such as tuition and basic living expenses. Most of them considered the income as extra money. This is because all interviewees in the sample had stable and sufficient sources of funding. Students from middle class families got support from their parents, while students from low-income families got full or partial support from the National Financial Aid System for Low-

Income Students through scholarships, need-based financial aids, and/or subsidized student loans. Therefore none of them faced a tight "strict" credit constraint.

Most of the students used the income from term-time working to pay for discretionary consumptions. For instance, a student from an upper-middle-class family said that:

> *"I have sufficient funding to cover the living expenses. But I do not want to ask my parents for things like expensive clothes. "*
>
> *—Mr. Hou from the "985" institution, majoring in Industrial Engineering.*

Also, a student from rural area said:

> *"With the money I earned, I was able to pay for clothes and a better cellphone by myself. …… I also started to treat my friends to dinner frequently."*
>
> *—Mr. Yong from the non-key institution, majoring in Applied Physics*

In addition, there is a student from a working-class family who did not mentioned monetary compensation as an incentive through out the interview. When asked whether money is important to him, he answered:

> *"The feeling that I am able to make money makes me feel fulfilled. But I actually do not spend a lot of money in daily life. I have an economic sense."*
>
> *—Mr. Ming from the "985" institution, majoring in English Literature*

Mr. Ming and other students' answers suggest that the primary use of term-time working income for many students is to relieve their "fuzzy" credit constraint, which is decided by the chosen level of discretionary consumptions.

Yet, students from low-income families do place more emphasis on the monetary compensation than students from middle class families, as they face heavier financial pressure after all. A student who took loans to pay for college said:

> *"I was thinking that if I could make some money in college, it would be easier for me to pay back the loans in the future."*
>
> *—Ms. Yan from the non-key institution, majoring in Information Management*

Many of the students from low-income families work in order to relieve their parents' financial burden. For instance, a student bought a laptop with the money earned by doing private tutoring. She said she did not want to ask her parents for the laptop, as they already paid a lot for her education. She had another two siblings, yet was the only one who attended college because her parents could only afford one college student. Other students from low-income families also talked about reliving parents' financial burden. A student from rural area said:

> *"Actually I was not in bad need of money at that time. My parents wanted me to focus on study, and they gave me a lot of money every year. …… I still want to help my parents and take some of the (financial) burden on me."*
>
> *—Mr. Guang from the non-key institution, majoring in Chinese Literature*

Mr. Yong who used some of the income from term-time working to pay for clothes and cellphone and treat friends to dinner also mentioned:

> *"Working does help release my parents' burden. At least, after I started to work, I took less and less money from my family."*
>
> *—Mr. Yong from the non-key institution, majoring in Applied Physics*

These suggest that many low-income students, though do not face a strict credit constraint, consider term-time working as a necessary source of funding.

Overall, the above analysis reveals that monetary compensation is a common reason for college students to work in term time, especially for low-income students; but most students do not rely on it to pay for nondiscretionary expenses. It is consistent with previous Chinese survey studies which found that 20% to 40% students worked primarily for monetary compensation, but only a few work to pay tuitions (e.g. Y. Deng et al., 2004; S. Jing et al., 2005; Qian Li, 2008; Ma, 2012; Ren et al., 2013; S. Wang, 2010). This pattern is also consistent with the results of the quantitative analysis presented in Section 4.3, which show that the tuition of college is not statistically significantly associated with students' participation in term-time working, but those with need-based financial aid or loans are more likely to work and work more in term time.

Social experience and skills

Though monetary compensation is the most frequently mentioned reason for term-time working, many students do not purely work for money. For instance, Ms. Cong, who emphasized that she would not take unpaid jobs, raised her second criterion of choosing a job:

> *"Second, I will only take the job from which I can learn something."*
>
> *—Ms. Cong from the non-key institution, majoring in International Economics*

Similar to Ms. Cong, many students want to learn something from working, especially things that cannot be learned in classrooms. They consider working as a way to broaden their horizons and improve their personal skills.

The first thing that students want to learn from working is social experience. A student from the "985" institution said,

> *"Many of my friends work for extra money. But for me, I value more the experience in the society. I have been staying in school all my life. I am eager to know what it looks like outside the campus, to know how it feels to work."*
>
> *—Ms. Xin from the "985" institution, majoring in English Literature*

Mr. Guang, who considered term-time working as a way to share his parents' financial burden, pointed out that his primary incentive to work was not for monetary compensation but for social experience:

> *"I felt that I should get involved with the society. They all say that the society is very complex, but I do not know how complex it is. Therefore I decided to get into the society, just for curiosity. Actually I was not in bad need of money at that time."*
>
> *—Mr. Guang from the non-key institution, majoring in Chinese Literature*

As Ms. Xin and Mr. Guang said, the world outside campus is very attractive to young college students who have spent 12 years in school. They consider working as their first contact with the society outside school. Over half of the interviewees, including those from low-income families, emphasized that gaining social experience was a more important reason for them to work in term time than making money.

Beside general social experience, students also work in order to improve their personal skills. Some explicitly pointed out their goals:

> *"I do not have strong interpersonal skills. So I want to improve it by taking part-time jobs."*
>
> *—Mr. Sen from the non-key institution, majoring in History*

> *"I want to improve my social skills. …… I think working outside school can improve one's emotional intelligence. For instance, you can learn how to deal with different problems and issues. I think this would be helpful to one's development."*
>
> *—Ms. Ran from the non-key institution, majoring in International Economics*

Like Mr. Sen and Ms. Ran, many students think that they are lack of soft skills, such as interpersonal skills, communication skills, and problem solving skills. They believe that working provides them with an opportunity to practice and improve these skills.

Overall, the above findings reveal that accumulating social experience and skills is another important reason for college students to work in term time. Many students value it more than monetary compensation. They consider working as a way to get involved in the world outside school and to gain skills that cannot be learnt in class. This finding is consistent with previous Chinese survey studies (e.g. Cheng & Wang, 2010; S. Jing et al., 2005; T. Li, 2011; Ma, 2012; Qian, 2011; Yuan et al., 2009; M. Zhang & Wu, 2008).

Career-related experience and skills

In addition to general social experience, students also work in order to gain career-related experience and skills. Some students expect improvement in specific practical skills. For instance, Mr. Guang who majored in Chinese Literature in the non-key institution took an unpaid internship in a local newspaper in the senior year in order to learn and practice interview skills. Some others hope to broaden their knowledge about the industries to make better career choice. For instance, Ms. Meng from the "985" institution majoring in English Literature intentionally took several part-time jobs and internships in different industries in order to find out which industry suited her best. In addition, for those who plan to enter the job market right after college, the major goal is to enrich their resume to improve their competitiveness in the job market. They intentionally accumulate working experiences that are relevant to their career goals, such as career-related internships.

The three interviewees from the “985” institution who planned to work after graduation all explicitly pointed out that they took internships in order to qualify themselves to better jobs. One of them said:

> *“I decided to work after graduation at a very early time in college, maybe as early as the end of my first year. From then on I started to pay attention to social (working) experience, as I know it would have a direct impact on job searching after graduation.”*
>
> *—Mr. Hou from the “985” institution, majoring in Industrial Engineering*

Though majoring in engineering, Mr. Hou was looking for jobs in consulting firms. He knew that he was in a disadvantaged place when competing with students from more relevant majors such as economics and business management. Therefore he took several part-time jobs and five internships in college to improve his competitiveness. One of his internships was during term time, when he was also busy with course works and other exams for professional certificates. When asked why he took that internship as he already had some during vacations, Mr. Hou said:

> *“I have to because I need a piece of working experience in a foreign-owned consulting company to boost my resume. …… You need at least three pieces of internship experiences (to get a good job), but can accumulate only one in the summer of the junior year. Therefore you have to work in term time to get more*

experience. I personally do not want to do so; but this is what the job market requires."

—Mr. Hou from the "985" institution, majoring in Industrial Engineering

Mr. Hou was pushed to work by the perceived level of competitive pressure in the job market. Similarly, Ms. Guo majoring in Finance also raised up the same reason when talked about her second internship:

"The first internship was not good enough to be a highlight on my resume. I need a more intensive one, something that I can talk about in job interviews."

—Ms. Guo from the "985" institution, majoring in Finance

Ms. Guo took her first internship in the summer of the sophomore year, but was not satisfied with her experience. She started another one in the summer of the junior year, which lasted for four months until the October of the senior year. The third interviewee, Mr. Ming majoring in English Literature, made his post-college decision in late junior year. He immediately started to look for internships once he decided to enter the job market after graduation. He finally took an internship for two months in the summer of the junior year. Overall, all the three interviewees from the "985" institution highlighted the importance of internship experiences in the job market. They intentionally took internships before entering the job market to improve their competitiveness and get prepared.

However, to accumulate career-related working experience is not a common incentive among interviewees in the non-key institution. Even among the four students who planned to enter the job market after graduation, only one student, Ms. Yan majored in Information Management, mentioned that she started an internship to get some formal working experience in the second semester of the senior year. Yet she quitted the job after one week of on-site working because she found it to be boring and low paid. This illustrates that she did not actually place much emphasis on formal working experience. Another student from the non-key institution, Ms. Wang majoring in Material Engineering, was taking a major-related internship at the time of the interview. She received a full-time job offer from the employer because of her good performance as an intern. She did not have any other internship experiences before, nor did she apply to any internship positions. Her current internship was recommended by one of her professors. For Ms. Wang, this internship was just like the probation period of a formal job. Her experience is quite common among students in that non-key institution. According to some interviewees from the non-key institution, many of their classmates went to other cities in the second semester of the senior year to work as interns, with a hope to stay in the company after the internship. This suggests that interviewees from the non-key institution and the "985" institution attach different values to internships. Those from the non-key institution tend to consider the internship period as a transition stage to a formal job, whereas the interviewees from the "985" institution tend to consider the internship experience as a stepping stone to a better job. This explains why those from the "985" institution took more internships than those from the non-key institution.

This different perception about the value of internships may be influenced by students' perception about the job qualifications and their chosen competition level in the job market. The three interviewees from the "985" institution, though majoring in different subjects, were all looking for jobs in the business and professional service sector, where the employers place great value on past working experience. In comparison, two of the interviewees from the non-key institution were looking for jobs in the engineering and science sector, where the employers give more emphasis on major-related knowledge and skills that can be obtained in class. The other two interviewees from the non-key institution also looked for jobs in the business sector, but they were applying for less selective and low-paid jobs such as sales representatives. By contrast, the three interviewees from the "985" institution were applying for high-paid jobs in consulting firms or investment banks, which usually attract many highly capable candidates. In other words, they placed themselves in a more severe competition in the job market than those from the non-key institution, and therefore they were more anxious to get valuable working experience in college to stand out in job interviews.

<u>Other incentives</u>

There are also some other incentives for students to work in term time and in college. Some students do not have a clear motivation, but just to spend free time or to follow other students. Four out of the eighteen interviewees in the sample said that they did not think about what to gain from working before they started to work. Two of them just worked for fun:

> *"I had ample of free time at that time (in the first summer), but did not have much things to do. So I wanted to try something fun. That is the only reason."*
>
> *—Ms. Wen from the "985" institution, majoring in Industrial Design*
>
> *"My friend told me that they need a private tutor. I said, 'OK, I will go'. I was not in short of money at that time, but I had been in low spirits for a while. So I worked to cheer up my boring life."*
>
> *—Ms. Xiao from the "985" institution, majoring in Mechanical Engineering*

Another interviewee worked to follow her friend:

"I did not have a specific purpose to take part-time jobs. …… I took the job (as a flyer distributor) purely because my friend asked me to accompany her."

—Ms. Ling from the non-key institution, majoring in International Economics

The last interviewee who took a work-study job as a dorm assistant in the summer of the sophomore year worked both to spend free time and to follow other students:

"(In the summer of the second year,) I felt boring to stay at home for two months. It is a waste of time. Many students were taking work-study and part-time jobs in that summer."

–Mr. Ming from the "985" institution, majoring in English Literature

These students are not unique. According to previous Chinese literature, about 2% to 8% of students in different studies worked without specific purpose, but to have fun, to spend free time, or to follow their peer students (Cheng & Wang, 2010; B. Chu et al., 2010; S. Jing et al., 2005; L. Li et al., 2011; Ma, 2012; S. Wang, 2010; M. Zhang & Wu, 2008; Zheng & Wu, 2014).

Among students who work with clear motivations, free time is still an important incentive of working. In the interview sample, one third of the students mentioned that the idea of finding a job first came to them when they had free time. But time is also a constraint of term-time working participation and shapes students' term-time working behavior. This will be discussed later.

To follow other students is also one incentive for students who work with clear motivations, as the analysis finds that they may follow others in choosing the job to take. For instance, an interviewee from the non-key institution, Ms. Xiang, whose primary incentive to work was to make spending money and to fill up her free schedule, worked as a private tutor from the first year to the third year in college. When talked about her choice of job, she said:

> *"At the beginning, I just wanted to work, but had no idea about what I could do. …… Girls around me were all taking private tutoring jobs. So I also took private tutoring jobs."*
>
> *—Ms. Xiang from the non-key institution, majoring in statistics*

Other students also talked about the influence of their friends, classmates, and senior students on their choice of jobs. For instance, Ms. Meng from the "985" institution majoring in English Literature who worked as an English tutor for an educational company in the senior year said that five out of eight students in her dorm worked as English tutors, and she was the sixth. Though her motivation of taking the job was different from her roommates, their working experiences made her aware of this opportunity. Peers may also influence students' choice of off-term jobs. Another interviewee, Mr. Yong from the non-key institution, organized a summer tutoring camp for primary school students in his hometown. He got this idea from one of his friends incidentally, and carried it out because he thought it worth doing. Overall, the above evidence suggests that peer students may influence students' working decision by opening up their mind about what they could do and increasing their awareness of available opportunities.

<u>Changing motivations</u>

Most interviewees in the sample have more than one piece of working experience in college. Some of them pointed out that they took different jobs for different purposes.

For instance, Ms. Guo took a work-study position in the first semester of the sophomore year, a student mentor job in a summer camp, and two internships in the sophomore and senior years. She explained the change of her reasons to work:

> *"At the beginning I worked for extra money, as well as some social experience. Then in later years, I worked to gain career-related skills."*
>
> *—Ms. Guo from the "985" institution, majoring in Finance*

Similarly, a student in the non-key institution who took several part-time jobs before and in college said:

> *"The most important reason for me to work in the summer before college was to make money to cover my living expenses. Then after I entered college, I work to the improvement I can gain from the jobs. There are about three stages, in the first stage I just want to make money. In the second stage, I want to get some personal skills. And in the third stage, I want to gain some career-related skills. I have different emphases in different stages."*
>
> *—Mr. Liang from the non-key institution, majoring in Electronic and Information Engineering*

Even Ms. Wen, who worked for fun in the summer of the freshman year, took an internship in the second semester of the fourth year in order to do her independent project. These students' experiences suggest that students adjust their expectation from working according to what they need in different period in college. As summarized by Mr. Liang, when students first enter college, their major purpose to work may be to make money and to learn about the society, or they may even have no specific purpose. Then when they get into senior years, they start to place more emphasis on gains in career-related skills and experience. Though no previous study asked about students' changing motivation of working in different years, a study which surveyed students in different grades in a "985" institution revealed a similar pattern. The study found that students in the first two years are more likely to work for extra money, while students in the last two years are more likely to work for career-related experience (Zhengfa Liu & He, 2005).

Time constraint

As shown above, to spend free time is one of the incentives for students to work. Yet in term time, free time is rather a necessary condition than a sufficient reason of working for most of the interviewees. Many students work when they have free time, and stop working when they have heavier course load. For instance, Mr. Guang, whose major reason to work was to gain social experience, talked about the influence of time constraint on his term-time working behavior:

> *"I had plenty of time in the freshmen year, and plenty of energy. I did not have many other things or exams, so I went outside (the campus to work). …… Then in the third year, we started to take various major-specific core courses. So I had less time and had to stay on-campus. I did not do anything on campus."*
>
> *–Mr. Guang from the non-key institution, majoring in Chinese Literature*

For another example, Ms. Xin from the "985" institution started an internship in the first semester of her senior year when she did not have many courses, and quitted the job when the school schedule became tight in the second semester. Mr. Yong from the non-key institution who took a part-time job in the first semester of the senior year to fill up his schedule made the same decision when he started his bachelor's project one month later.

Furthermore, some students choose not to work in academic semester, as they perceive a time constraint. The only student in the interview sample who does not have term-time working experience, Mr. Ming from the "985" institution, explained why he did not work in term time:

> *"The main reason is that the schedule cannot fit in. Actually there were some jobs I wanted to take. However, for instance, some internship requires three workdays per week, which is not possible for me. I cannot put away my courses and studying to work. I am still a student after all."*
>
> *–Mr. Ming from the "985" institution, majoring in English Literature*

He took a work-study job in the summer of the sophomore year to fill up the free time, and an internship in the summer of the junior year to enrich his resume.

When working in term time, students proactively adjust their term-time working behavior according to the school schedule. They intentionally arranged the working time to be in the weekend or after class, in order to avoid conflicts with the course schedule. When a conflict could not be avoided, most students chose to attend class instead of went to work. Only a few said they skipped one or two classes to work under some special circumstances. These behaviors suggest that students in this sample placed more emphasis on studying than on working. This may be due to the selection bias of the sample. Students in the "985" institution are all top-performers in the NCEE exam, while most of students in the non-key institution sample were top students in their program.

In summary, the qualitative analysis of interview data reveals that Chinese undergraduate students' term-time working behavior is primarily motivated by their financial need and eagerness of exploring the world outside school, but is constrained by time availability. This finding is consistent with previous Chinese survey studies. In addition, the analysis reveals that students' motivation of working is influenced by their family background and self-expectation. Low-income students place more emphasis on monetary compensation than students from middle class families, though they may not rely on working to pay for basic college costs. Students with higher self-expectation place more emphasis on career-related working experiences in order to prepare themselves for more demanding jobs. Third, the analysis suggests that students' motivation of working changes over time. In the first two years in college, many students work to get extra money and general social experience; while in the last two years, many students work to get major and career-related experience and skills. Finally, the interviews reveal that some students tend to follow their peers when making term-time working decisions. Peers may not only influence their participation in term-time working, but also their choice of jobs.

4.5 Summary and discussion

Working while enrolled is getting more and more prevalent among Chinese college students. However, there is no nation-wide record on the incidence of term-time working in Chinese universities and colleges. Previous survey studies only described the situation in selected institutions and selected areas, and did not differentiate working in term time and in vacations. In addition, though previous studies revealed some of the reasons for students to work in college, few of them examined the determinants of students' working behavior and explored student working experience in details. This chapter presents quantitative and qualitative findings on the incidence of term-time working, characteristics of jobs taken by students, and factors that influence students' term-time working behaviors in four-year universities and colleges in China.

With a nationally representative dataset collected through the CSLM 2011 survey, this study finds that the majority of students in Chinese universities and colleges have working experience during college. About 78.1% of students in the Cohort 2007 sample worked at some point during college, and 62.7% worked during term time. The percentage of term-time working students varies across institutions. Non-key institutions have a higher percentage of term-time working students than elite institutions and independent institutions, and institutions with special academic concentrations have more term-time working students than comprehensive institutions and engineering-concentrated institutions. Institutions with urban campuses have a higher percent of term-time working students than institutions located in suburban areas.

In general, students work only for a short period. The term-time working students in this sample on average worked for 5.67 months during term time, with about 33.4% of them worked for 2 months or less. Only 15.6 % of term-time working students worked for more than two semesters. With regards to working intensity, students on average spent about 23 hours per week on working during term time, which can be considered as heavy workload according to the U.S. standard. About 31.3% of term-time working students worked for no more than10 hours per week, and10% of them worked for more than 40 hours per week. In addition, the study finds that students spend more hours on working as they get into senior years. They spent 14 hours per week on working during the first year in college, 16.7 hours per week during the second year, 20.6 hours per week during the third year, and 24.8 hours per week during the fourth year.

With regards to the forms of term-time jobs, the quantitative data show that part-time jobs and internships are more popular than work-study jobs. In the Cohort 2007 sample, 58.5% of the term-time working students took internships during term time, 56% took part-time jobs, and 31.8% took work-study positions. In addition, about 37.6% of the students took more than one forms of job during term time. The data also reveals a shift form low-skill jobs in forms of work-study and part-time jobs to high-skill jobs in forms of internships as students entering senior years in college. The qualitative analysis, with data collected through interviews with 18 working students in two institutions, also provides some evidence about the forms of jobs taken by students. Similar to the quantitative findings, the qualitative data show reveals that work-study jobs are the least popular form of term-time working. In addition, it shows that job availability influences students' term-time working behavior. Interviewees from the "985" institution took more on-campus work-study jobs because the institution has a well-established work-study program which opens to all students. Interviewees from the non-key institutions took less formal internships because the institution locates in a small city where there are few internship opportunities.

In order to explore the reasons for students to work in term time and the potential determinants of students' term-time working behaviors, this study first compares working and non-working students and examines the associations between potential influential factors and students' term-time working behaviors with the quantitative data, and then investigates the motivations and incentives of term-time working with the qualitative data. In summary, the basic comparison finds that term-time students are more likely to be from disadvantaged family and academic background, but they perform at least as well as non-term-time working students in college, and they are more likely to get a job offer before graduation, thought the starting wage is lower than that of non-term-time working students. The regression analysis reveals that the participation, length, intensity, and total amount of term-time working are associated with students' innate ability, financial need, and the institution they attended. Those with higher non-cognitive ability, higher financial need, and attending institution with higher percentage of working students are more likely to work and work more in term time. The qualitative analysis shows that students' financial need and eagerness of gaining social and practical experience and skills are the two major reasons for them to work in college. Their motivation is influence by the family background and self-expectation, and changes as they go further in college. In addition, students' term-time working decision is influenced by the time constraint. Many students actively adjust their term-time working behaviors according to the school schedule.

The quantitative and qualitative findings support and complement each other. First, the quantitative analysis shows a shift from low-skill work-study and part-time jobs to high-skill internships when students enter senior years in college. The qualitative analysis reveals a parallel change in the motivation from earning money and gaining general social skills to obtaining career-related practical experience and skills. These trends are consistent with each other, as students who work for career-related experience are more likely to take internships. Secondly, the quantitative analysis finds that having need-based financial aid and having loan are associated with more working in college, but tuition charged by the institution does not influence students' working behavior. Consistently, the quantitative analysis shows that most students do not rely on working to pay for tuition, as they have various types of financial aid; but students from low-income families place more emphasis on monetary compensation from working, and therefore work more in term time. In addition, the quantitative analysis finds that the amount of family fund also has no significant association with in-college and term-time working behaviors. This can be explained by the qualitative finding that many students work in order to make extra spending money. Third, the quantitative analysis reveals a positive association between the percentage of term-time working students in the institution and individual's term-time working behavior. This is supported by the qualitative finding that some students work to follow their peer students.

In addition, the quantitative and qualitative findings together suggest some potential sources of selection bias in the analysis of the impacts of term-time working on academic performance and labor market outcomes. First, the qualitative analysis finds that many students actively adjust their term-time working behavior according to their school schedule. As discussed in Section 3.3.2.2, this will result in an upward bias of the OLS estimates on the impact on academic performance. Second, the quantitative analysis finds that students who are originally in a disadvantaged position in the job market are more likely to work in term time and more actively involved in other aspects of college life. The qualitative data provides a supportive example to this finding. An interviewee from the "985" institution, Mr. Hou, decided to apply to jobs in an industry other than his major area early in college. With a clear sense that he would be less competitive than students from relevant majors, Mr. Hou intentionally took five internships during college. In the meantime, he managed to maintain a good academic record and took some additional courses and earned two professional certificates. Mr. Hou's experience is an example of a self-selection into term-time working that is negatively related to labor market outcomes but positively related to academic performance. If this case is common in the quantitative sample, the OLS estimate on the impact on academic performance will be upward biased, while the OLS estimates on the impact on labor market outcomes will be downward biased. Third, the qualitative analysis provides some evidence of the existence of institutional selection in placing students into internship positions. Some interviewees got their internships from their professors' recommendation. But as only one student in each institution reported this phenomenon, there is no evidence on whether the recommendation is based on students' ability. As for work-study position, there is no evidence in the qualitative sample on whether the institutions select students into different work-study positions and assign different amount of working hours based on their ability. The quantitative data does not provide any information on the institutional selection. Overall, the quantitative and qualitative data suggest that it is necessary to address the endogeneity problem caused by students' self-selection when estimating the impacts of term-time working. The institutional selection bias discussed in Section 3.3.2.2 may not be a serious problem, and because of the data limitation, such bias cannot be controlled for in the quantitative analysis.

Chapter 5 The impact of term-time working on academic performance

Educational achievement is an important outcome of attending college. As suggested by previous theoretical and empirical studies, working during term time may influence students' educational achievement in both positive and negative ways. This chapter presents empirical findings on the impact of term-time working on academic performance of Chinese college students. Quantitative analysis on whether and to what extent there is an impact is presented in Section 5.1. It addresses Research Question 2.1 (Does term-time working have an impact on students' academic performance?) and Research Question 2.3 in Chapter 3 (Does the impact on academic performance vary by the forms of job taken by students?). Qualitative findings on the explanations of the impact are presented in Section 5.2, addressing Research Question 3.2 listed in Chapter 3 (What gains and losses from term-time working do students relate to their academic performances?). Section 5.3 summarizes and integrates quantitative and qualitative findings.

5.1 Quantitative findings on the impact of term-time working on academic performance

As summarized in the literature review section, no prior studies in China have estimated the impact of term-time working on students' academic performance with econometric models. According to previous survey studies, most working students believe that working during term time does not negatively influence their academic performance (Bao et al., 2010; Jun Li & Ma, 1999; Zhengfa Liu & He, 2005; Mi, 2004; Qian, 2011; X. Wang & Li, 2008; Zhao & Hao, 2010). The mean comparison between students who worked in term time and who did not work in term time presented in Table

4.3 shows that there is no statistically significant difference in the average course score of the two groups. Yet this kind of descriptive analysis cannot reveal the causal impact of term-time working on academic performance. The quantitative analysis of this study aims at estimating the impact with econometric strategies. As suggested by previous U.S. studies and the findings in Chapter 4, the OLS estimates of the impact of term-time working might be biased because working in term time is an endogenous decision. This study uses the Propensity Score Matching (PSM) strategy and Instrumental Variable (IV) strategy to test and address this problem. The rest of this section is organized in the following order: Section 5.1.1 presents the OLS estimates as baseline results for comparison; Section 5.1.2 presents the analysis with the PSM strategy; Section 5.1.3 presents the analysis with the IV strategy; Section 5.1.4 presents an analysis of the impacts of different term-time job forms, and a check of the robustness of the estimates; and Section 5.1.5 concludes the quantitative analysis.

5.1.1 The OLS estimates of the impact of term-time working

As presented in Section 3.3.2.1, the impact of term-time working on academic performance is estimated with the following model:

$$A_i = \alpha_0 + \alpha_1 W_i + \alpha_2 X_i + \varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.2)$$

where A_i is the average course score in college, W_i is a measure of term-time working, and X_i is the covariate set specified in Section 3.3.2.1 which includes individual characteristics, family background, college experience, and institutional characteristics. The estimated coefficient of W_i, i.e. α_1, shows the impact of term-time working on average course score. Results of the OLS regressions are presented in Table 5.1.

Four measures of term-time working are included in the model separately. Column 1 shows the impact of participation in term-time working as measured by whether or not the student ever worked in term time. Column 2 shows the impact of the length of term-time working as measured by total months worked in term time. Column 3 presents the impact of working intensity as measured by average hours worked per week in term time; and a quadratic form of hours worked per week in term time is added into the model in Column 4 in order to capture the non-linear impact of working intensity suggested by previous U.S. literature. Column 5 shows the impact of the total amount of term-time working as measured by the accumulated full-time equivalent working days during term time. For those who never worked in term time, the length, intensity, and total amount are treated as 0.

As shown in the table, the OLS estimates suggest that working during term time is statistically significantly associated with lower average course score in college, but the magnitude of the gap is very small. Holding other things constant, the average course score for students who worked in term time is 0.59 points lower than those who did not work in term time. This is a trivial difference as the average course score is on a 100-point scale and the standard deviation of this variable is 6.80. The length and total amount of term-time working are not significantly associated with academic performance. The association between intensity of term-time working and academic performance is statistically significant, but again the magnitude is very small. One additional hour worked per week in term time is associated with a decrease of 0.022 in average course score. As the mean of hours worked per week in this sample is 22.5 hours, this coefficient suggest that the average course score for students who worked at the mean intensity level in term time is about 0.5 points lower than that of students who never worked in term time. This magnitude is similar to the estimated association between average course score and participation in term-time working. The quadratic form of hours worked per week in Column 4 is not statistically significant, suggesting that the association between working intensity and average course score is linear. Overall, the OLS regressions reveal that working during term time is associated with lower academic performance, and the more hours worked per week, the lower the average course score. This finding is consistent with the prediction of Astin's (1984) student involvement theory, which suggests that term-time working may negatively influence students' academic performance because it occupies their time and energy.

Table 5.1 OLS estimates of the impact of term-time working on academic achievement (Dependent variables: average score in college)

	(1)	(2)	(3)	(4)	(5)
	Participation	**Length**	**Intensity**	**Quadratic intensity**	**Total amount**
Ever took work-study jobs during term time	-0.591*				
	(0.297)				
Total months worked during term time		-0.0210			
		(0.0210)			
Average hours worked per week during term time			-0.0218**	-0.0507+	
			(0.00777)	(0.0259)	
Square of average hour				0.000645	
				(0.000553)	
Accumulated full-time equivalent working days during term time					-0.00339+
					(0.00186)
Age	0.0968	0.107	0.162	0.170	0.168
	(0.141)	(0.144)	(0.141)	(0.141)	(0.143)
Female	2.162***	2.050***	2.160***	2.182***	2.077***
	(0.278)	(0.284)	(0.282)	(0.284)	(0.287)
Minority	-0.295	-0.218	-0.744	-0.766	-0.726
	(0.599)	(0.603)	(0.586)	(0.585)	(0.594)
From municipalities	-1.708**	-1.783**	-1.612**	-1.593**	-1.680**
	(0.575)	(0.583)	(0.586)	(0.586)	(0.593)
From central or west area	-0.496	-0.516	-0.301	-0.273	-0.294

	(0.383)	(0.394)	(0.330)	(0.331)	(0.336)
From rural area	-0.00744	-0.00531	-0.174	-0.176	-0.149
	(0.353)	(0.365)	(0.366)	(0.366)	(0.372)
Single child	0.438	0.493	0.519	0.506	0.529
	(0.324)	(0.334)	(0.323)	(0.323)	(0.327)
SES score	-0.484**	-0.469*	-0.490*	-0.498**	-0.502**
	(0.186)	(0.191)	(0.190)	(0.190)	(0.192)
Student leader in senior high school	0.898**	0.891**	0.737**	0.740**	0.718*
	(0.275)	(0.281)	(0.279)	(0.279)	(0.283)
Humanity track in high school	0.541	0.625	0.667	0.649	0.700
	(0.469)	(0.480)	(0.465)	(0.460)	(0.470)
Arts or athlete student in high school	2.156*	2.289*	2.327*	2.295*	2.396*
	(0.981)	(1.000)	(1.039)	(1.041)	(1.049)
NCEE score (rescaled to 1~100)	0.0680*	0.0699*	0.0669*	0.0663*	0.0664*
	(0.0269)	(0.0273)	(0.0280)	(0.0280)	(0.0283)
Science or Engineering major	-0.848+	-0.799+	-0.728	-0.755	-0.690
	(0.469)	(0.483)	(0.466)	(0.464)	(0.469)
Economics or Management major	-0.489	-0.439	-0.178	-0.199	-0.148
	(0.528)	(0.540)	(0.485)	(0.484)	(0.490)
Preference degree of one's major	1.249***	1.235***	1.233***	1.234***	1.204***
	(0.179)	(0.185)	(0.182)	(0.182)	(0.185)
Hours spent per week on studying after class	0.0310*	0.0329*	0.0345*	0.0352*	0.0372*
	(0.0152)	(0.0158)	(0.0146)	(0.0146)	(0.0148)
Have a minor	1.040*	1.035*	1.209*	1.200*	1.181*
	(0.476)	(0.501)	(0.472)	(0.474)	(0.483)
Party member	1.294***	1.300***	1.173***	1.161***	1.189***
	(0.291)	(0.298)	(0.296)	(0.296)	(0.300)
Student leader	0.540+	0.485	0.453	0.473	0.433
	(0.316)	(0.326)	(0.326)	(0.326)	(0.333)
Have merit-based aid	4.005***	4.038***	4.143***	4.158***	4.201***
	(0.286)	(0.293)	(0.278)	(0.278)	(0.281)
Have need-based aid	0.604*	0.622*	0.487	0.498	0.515
	(0.304)	(0.313)	(0.306)	(0.307)	(0.315)
Have loan	-0.274	-0.298	-0.172	-0.141	-0.163
	(0.313)	(0.325)	(0.321)	(0.322)	(0.329)
Comprehensive institutions	0.521	0.593	0.480	0.472	0.546
	(0.389)	(0.398)	(0.398)	(0.397)	(0.404)
Engineering-concentrated institutions	-0.684*	-0.680+	-0.786*	-0.808*	-0.783*
	(0.341)	(0.353)	(0.356)	(0.354)	(0.363)
"985" institution	-0.0332	-0.0162	0.0252	0.0273	0.0373
	(0.413)	(0.419)	(0.424)	(0.424)	(0.430)
"211" institution	-0.254	-0.292	-0.315	-0.309	-0.292
	(0.264)	(0.270)	(0.275)	(0.275)	(0.278)

Independent college	1.778*	1.891*	2.225**	2.209**	2.268**
	(0.822)	(0.840)	(0.844)	(0.845)	(0.853)
Institution located in municipalities	0.725	0.806	0.879+	0.875+	0.868+
	(0.506)	(0.517)	(0.519)	(0.520)	(0.523)
Institution located in central or west area	0.470	0.488	0.424	0.385	0.368
	(0.432)	(0.443)	(0.379)	(0.380)	(0.384)
Campus located in suburban	-0.373	-0.336	-0.219	-0.230	-0.259
	(0.296)	(0.302)	(0.306)	(0.307)	(0.312)
% of low-SES students in the institution	-5.823*	-5.784*	-4.992*	-5.005*	-5.188*
	(2.269)	(2.314)	(2.309)	(2.317)	(2.338)
Constant	67.20***	66.42***	65.36***	65.35***	65.15***
	(4.330)	(4.384)	(4.260)	(4.270)	(4.293)
N	5,053	4,898	4,675	4,675	4,590
R-square	0.311	0.310	0.320	0.320	0.318
Adj. R-square	0.305	0.304	0.313	0.313	0.312

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Missing dummies are included in all models
3. + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

The OLS estimates also provide some evidence of the associations between students' academic performance and individual characteristics, family background, college experience, and institutional characteristics. Holding other things constant, the average course score of female students is about 2.2 points higher than that of male students. This is consistent with previous studies which found that female students perform better in male students in college (Y. Chu, 2011; C. Guo et al., 2010). Students with higher ability, i.e. those who are student leaders in high school and who have higher NCEE scores, have slightly higher average course score in college than other students. Yet, students from more advantaged family background, i.e. from municipalities and families with higher SES score, are more likely to have lower average course score in college. This is consistent with some of the previous studies (Y. Chu, 2011; W. Zhang, Zhang, & Wang, 2010) but is contradicted to some other studies (Gao, Liu, & Fang, 2011). A possible explanation, as suggested in W. Zhang, Y. Zhang, and R. Wang (2010), is that students from disadvantaged background are more diligent and study harder in college because they face more pressure to find a job after graduation, whereas students from more advantaged background face less pressure and therefore place less emphasis on academic performance.

With regards to college experience, students who have more positive attitude towards their major have statistically significant higher average course scores, other things held constant. This is consistent with previous Chinese studies which show that better academic performance is associated with positive attitude and motivation towards studying (Luo, 2012; Shi & Cheng, 2012; Yi et al., 2002; W. Zhang et al., 2010). Hours spent on reviewing after class is also statistically significantly associated with higher average course score. This is consistent with Astin's student involvement theory that students' academic achievement is determined by the time and effort devoted to it (Astin, 1984). Yet the magnitude of the association between hours spent on reviewing and average course score is small. One additional hour spent on reviewing per week is associated with an increase of about 0.03 points in the average course score. As for other aspects of college experience, having an academic minor, being a CCP member, and having merit-based financial aid are statistically significantly associated with higher average course score. This is as expected because good academic record is one of the requirements to apply for academic minor, CCP membership, and merit-based financial aid. The coefficient for having need-based aid is significant in the first two models where term-time working are measured by participation and length respectively, but is not significant when the intensity of term-time working is used in the model. Students' academic major, whether is a leader in institutional or departmental student organizations, and whether has loan are not significantly associated with their average course score.

With regards to institutional characteristics, holding other things constant, students in independent colleges have higher average course score compared to students in non-key institutions, while students in "985" and "211" institutions have similar average course score with those in non-key institutions. As the NCEE threshold of independent colleges is the lowest among four-year institutions, students in independent colleges have the lowest academic ability compared to those in other institutions. Therefore the higher average scores in independent institutions should not be driven by academic ability but may reflect a looser academic standard in independent institutions compared to other four-year institutions. This suggests the average course score of students in independent institutions is not strictly comparable to that of students in other types of institutions. In addition, the average course score for students in engineering-concentrated institutions is statistically significantly lower than the average score in institutions with other concentrations. This may also suggest that engineering-concentrated institutions are more demanding than institutions with other concentrations. Besides these characteristics, the percentage of low-SES students in the institution is statistically significantly and negatively associated with individual students' average course score. Institution and campus location do not have statistically significant associations with students' average course score.

As suggested by the finding above, the average course score may not be strictly comparable across types of institution. Though most institutions adopted the same grading scheme regulated by the MoE guidelines, elite institutions (i.e. "985" & "211" institutions) may have more strict grading level than non-elite institutions (i.e. non-key and independent institutions). In addition, the academic atmosphere in elite institutions may be more favorable to high achievements than that in non-elite institutions. In other words, students in elite institutions may be more motivated and place more emphasis on academic performance than those in the non-elite institutions. Also, students in elite institutions have higher academic ability than those in the non-elite institutions, as they are top performers on the NCEE exam. Therefore the impact of term-time working on academic performance may also vary across elite and non-elite institution. A subgroup analysis by elite and non-elite institution is conducted to test whether the impact varies. The results are shown in Panel 1 of Table A4.1 in Appendix 4. It shows that the association between term-time working participation and average course score is not statistically significant in the elite institution sample; but is statistically significant in the non-elite institution sample, though the difference between the magnitude of coefficients is not statistically significant (t-value=0.74). This finding suggests that the academic performance of students in non-elite institutions is more likely to be negatively influenced by term-time working; while the academic performance of students in elite institutions may not be influenced by term-time working. As students in elite universities in general have higher academic ability and are more motivated than those in non-elite universities, this finding indicates the existence of a heterogeneous impact of term-time working on students' academic performance by innate academic ability and motivation. Working during term time decreases the average course score for students with lower academic ability and motivation, but may not be harmful to students with higher academic ability and motivation.

Overall, the OLS estimates suggest that there are small but negative impacts of participation and intensity of term-time working on students' academic performance. This finding is opposite to what was shown in previous descriptive studies. In addition, the findings also suggest that students' academic performance in college is influenced by gender, ability, family background, attitude towards and effort spent on studying, and some institutional characteristics.

5.1.2 Application of the Propensity Score Matching (PSM) strategy

The OLS estimates of the impact of term-time working presented above may be biased because of the endogeneity problem. If students with higher ability and/or higher motivations were more likely to work in term time, the OLS estimates would be upward biased; on contrary, if students who dislike studying were more likely to work, the OLS estimates would be downward biased. This section tests the direction of the bias with the PSM strategy.

As discussed in Section 3.3.2.3, PSM provides a way to construct a comparable comparison group by matching up treated and untreated observations on an estimated propensity score of being treated. Members in the matched groups have the same or very close probability of being treated, but are different in the actual treatment status. The two assumptions of PSM are the Common Support condition and CIA assumption. The remaining part of this section first describes the construction of the propensity score, then describes the matching process and checks the validation of the two assumptions after matching, and finally presents the PSM estimates and compares the results with the OLS estimates.

5.1.2.1 Construction of propensity score

The first step of the PSM strategy is to estimate the probability of working in term time with available covariates. In order to justify the CIA assumption, it is important to include as many as possible confounding factors that influence both the probability of working in term time and the academic performance. The model is constructed based on Equation 4.1 and Equation 3.2. These equations have already controlled for the confounding factors suggested by the theory, including students' innate ability, motivations, family background, college activity, and institutional characteristics. Some modifications are made to incorporate the suggestion of Caliendo and Kopeinig (2005) that only variables that are not influenced by treatment, i.e. term-time working, should be included in the model.

Specifically, the model to estimate the propensity score uses the same measures of students' ability, motivation, and family background as in Equations 4.1 and 3.2, including NCEE score and whether the student was a student leader in high school as measures of students' ability, degree of preference towards one's major and whether worked in high school as measures of motivation, and whether is the only child in one's family, family SES score, whether from rural area, and region of residency as measures of family background. Individual demographic characteristics such as age, gender, and race are also included in the model. As for the measures of credit constraint, the model follows Equation 4.1 to include posted tuition and the amount and type of financial aid, but replaces the amount of family fund with the average household income. This is because the former one may be influenced by term-time working—working students may need less funding from their family than non-working students. As for college experience, academic major, whether the student has a minor, whether the student is a student leader, and whether the student is a CCP member are included in the model as in Equations 4.1 and 3.2. The hours spent on studying after class is replaced with the hours spent on taking class. The former is a measure of effort devoted to studying, but it might be influenced by term-time working as students can decide how to spend their time after class. In comparison, the latter is a measure of course load and is mainly decided by the program requirement rather than students' self-decision.[18] With regards to institutional characteristics, the model follows Equations 4.1 and 3.2 to include the academic ranking level, concentration, region, campus location, the percentage of term-time working students, and the percentage of low-SES students.

The model is estimated with probit regression. The sampling weight is not applied in estimation because there is no available package in Stata 12 to incorporate sampling weights in the propensity score matching process. Out of this reason, the PSM estimates are not comparable to the OLS and IV estimates where the sampling weight is applied. In this section, results from an OLS regression without sampling weight are presented as the baseline of comparison. The primary purpose of applying the PSM strategy is to examine the direction of the bias in OLS estimates.

5.1.2.2 Checks for common support and balance on covariates

To achieve better balance on the covariates, three matching algorithms are used, including Nearest Neighbor matching, Kernel matching, and Radius matching with a

[18] A better measure of course load is the total amount of credits. However the variable is subject to the problems of missing value and measurement error, and therefore is not used in analysis.

caliper of 0.05. In addition, the matching process is stratified based on institution's academic ranking level, i.e. whether the institution is an elite ("985" or "211") institution. As elite institutions are different from non-elite institutions in many aspects, doing so can avoid matching up students facing different institutional environments. In addition, the stratified matching process allows for further subgroup analysis. Some interactions between variables and quadratic forms are added to the model to achieve better balance. The estimation outputs of the final model are presented in Table A3.1 in Appendix 3.

According to the common support condition, the estimated propensity score should be bounded between 0 and 1 and have sufficient overlaps between the treated and untreated groups so that observations can be matched up (Hirono & Imbens, 2001). Figure 5.1 presents the distribution of the propensity score for students who worked in term time (the treated group) and students who did not work in term time (the untreated group) to test this condition. It suggests that all observations are on the common support, and there are sufficient overlaps in the propensity score between the treated and untreated groups.

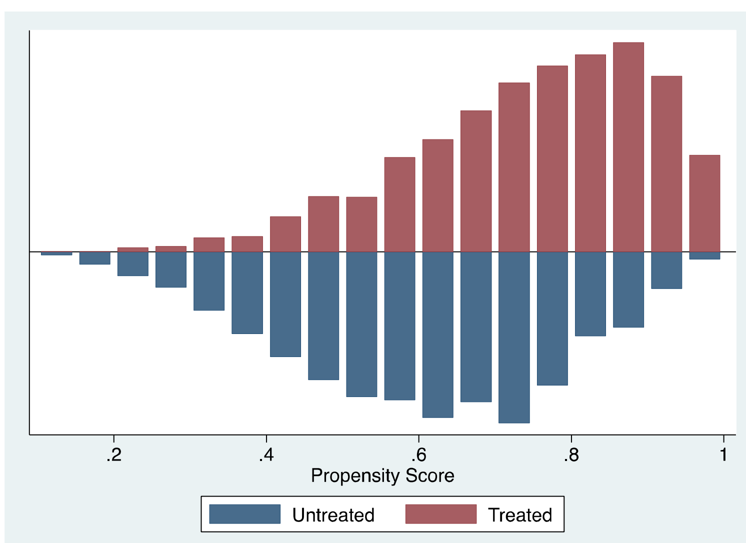

Figure 5.1 Distribution of the p-score of treated and untreated groups

As described above, three matching algorithms are applied to match up working and non-working students. The balance on covariates is examined after each matching with by checking the standardized difference (STD) in the means of the matched groups. STD is a statistic that compares the mean of continuous variables or the prevalence of binary variables and is not influenced by sample size and measurement unit (Austin, 2011). An obsolete value smaller than 0.1 is considered to indicate a negligible difference in the mean or prevalence (Normand et al., 2001). The standardized differences on covariates before and after matching are presented in Table 5.2. As shown in the table, all three matching processes reduce the standardized difference in means of the covariates to below 0.1. Kernel matching and Radius Caliper matching perform better than Nearest Neighbor matching in the sense that they generate smaller standardized differences. Further checks on the balance by matching strata (i.e. whether is an elite university) shows that the Nearest Neighbor matching does not generate balanced groups within strata. Therefore matched groups generated with this algorithm are not used in the final estimation. In addition to the check of balance in means, the distribution of continuous variables in the matched groups are examined to make sure that there are similar distributions and sufficient overlaps across post-matched treated and untreated groups (Austin, 2011). The histograms of the density distribution are presented in Figure A3.1 in Appendix 3.

Table 5.2 Balance checks of Propensity Score Matching
(Statistics presented: Standardized difference between treated and untreated groups)

	Pre-matched	**Post-matched**		
		Nearest neighbor matching	**Kernel matching**	**Radius caliper matching**
Student leader in high school	0.12	0.039	-0.004	-0.006
NCEE score	-0.162	0.052	0.027	0.023
Humanity track in high school	0.128	-0.047	-0.029	-0.03
Arts or athelet student in high school	0.116	-0.026	0.006	0.01
Worked in high school	0.027	-0.064	-0.037	-0.036
Preference degree of one's major	0.064	-0.028	-0.002	-0.001
Hours spent per week on taking class	-0.004	0.065	0.008	0.006
Tuition (sticker price)	-0.109	-0.04	-0.007	-0.007
Amount of financial aid	0.276	0.008	0.026	0.027
Have merit-based aid	0.229	-0.019	0.009	0.01
Have need-based aid	0.417	-0.019	0.018	0.023
Have loan	0.278	0.021	0.069	0.069
Age	0.165	-0.066	0.023	0.024
Female	0.327	-0.04	0.016	0.017
Minority	-0.016	0.026	-0.015	-0.015
From municipalities	0.066	0.06	-0.029	-0.029
From central or west area	0.048	-0.058	-0.013	-0.011
From rural area	0.291	0.102	0.032	0.033
Single child	-0.28	0.043	-0.003	-0.005
Household income	-0.177	-0.01	-0.03	-0.033
SES score	-0.266	-0.024	-0.009	-0.012
Science or Engineering major	-0.228	0.034	-0.005	-0.008
Economics or Management major	0.054	-0.055	-0.021	-0.02
Have a minor	0.024	-0.027	-0.026	-0.025
CCP member	0.056	-0.031	0.001	0.000
Student leader	0.053	-0.056	-0.028	-0.023
Institution located in municipalities	0.014	0.054	0.002	0.002
Institution located in central or west area	-0.047	-0.078	-0.043	-0.041
Comprehensive institutions	0.088	-0.02	-0.039	-0.037
Engineering-concentrated institutions	-0.163	0.035	0.014	0.012
985 institutions	-0.06	-0.04	-0.006	-0.006
211 institutions	-0.038	0.03	0.005	0.005
Independent institutions	-0.062	-0.047	-0.007	-0.008
Campus located in suburban	-0.005	0.037	0.001	-0.001
Percentage of low SES students	0.046	0.026	0.03	0.032
Percentage of term-time working students	0.382	0.031	0.048	0.05

5.1.2.3 PSM estimates of the impact of term-time working participation

Table 5.3 presents the regression adjusted propensity matched estimates on the impact of term-time working participation. The first panel presents the estimates with the whole sample, and the second and third panel presents the estimates with subsamples of elite and non-elite institution. In each panel, the OLS estimate without sampling weight is presented as a baseline for comparison. Then the estimates based on the Kernel matching and Radius Caliper matching are then presented respectively. Only the coefficients on term-time working are reported in this table. The full set of regression outputs are presented in Table A3.2 in Appendix 3.

Table 5.3 PSM estimates of the impact of term-time working participation on academic performance
(Dependent variable: average course score)

	Estimation strategy	**Coef.**	**N**	**R-squared**
(1) Whole sample	OLS w/o weights	-0.394*	5,053	0.328
		(0.181)		
	Kernel matching	-0.455*	5,052	0.347
		(0.196)		
	Radius caliper matching	-0.455*	5,052	0.348
		(0.196)		
(2) Elite institutions	OLS w/o weights	-0.291	2,460	0.366
		(0.247)		
	Kernel matching	-0.240	2,460	0.400
		(0.254)		
	Radius caliper matching	-0.244	2,460	0.399
		(0.254)		
(3) Non-elite institutions	OLS w/o weights	-0.525*	2,593	0.313
		(0.265)		
	Kernel matching	-0.581*	2,592	0.334
		(0.285)		
	Radius caliper matching	-0.578*	2,592	0.335
		(0.284)		

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$;
3. Full set of covariates is included in each model.

As shown in the first panel of the table, both the OLS estimate and the PSM estimates of the impact of term-time working participation on average course score of the whole sample are statistically significant and negative. The direction of the impact is consistent with the OLS estimates with sampling weight presented in previous section; but the magnitude of the OLS estimate without sampling weight is smaller than the OLS estimate with sampling weight. The magnitudes of the PSM estimates are similar to each other, and are larger than the OLS estimates. This suggests that the OLS estimate is upward biased and the negative impact of term-time working is underestimated by pooled OLS regressions. This direction of bias is understandable. As shown in Chapter 4, students who worked in term time are likely to be those who are more motivated and work harder in every aspect in college. Their diligence may offset the negative impact of working during term time. Failing to control for this factor in the OLS regression leads to the upward bias in the estimated impact of term-time working.

Panels 2 and 3 in Table 5.3 present the subgroup analyses on elite and non-elite institutions. The estimates of term-time working are not statistically significant in the subsample of elite institutions; but are statistically significant and more negative in magnitude for students in non-elite institutions, though the difference in magnitude is not statistically significant (t-value=0.89). This finding is consistent with the OLS estimates of the subsamples presented in Section 5.1.1. Again, this suggests a potential heterogeneous effect of term-time working on academic performance by students' academic ability and motivation group.

In summary, estimates from the Propensity Score Matching strategy suggest that there is a significant and negative impact of term-time working on students' academic performance, and the impact is heterogeneous by students' academic ability. However, like the OLS estimates, the PSM estimates are also subject to the Omitted Variable Bias because the propensity score is constructed with observables and the underlying assumption of CIA may not be satisfied. Out of this reason, the PSM estimates cannot be interpreted as the causal impact of term-time working. In addition, as the sampling weight is not applied in the PSM analysis, the magnitudes of the estimates are not comparable to previous OLS estimates and IV estimates presented in the next section. However, the comparison between the PSM estimates and OLS estimates without sampling weight suggests that the OLS estimates tend to underestimate the negative impact of term-time working on academic performance. Nevertheless, PSM and OLS estimates are similar in that they both show a negative and significant impact of term-time working on academic achievement.

5.1.3 Application of the Instrumental-variable (IV) strategy

This section presents the application of the Instrumental Variable strategy. It first presents the IV estimates of the impact of term-time working on students' academic performance, and compares the estimates to the OLS estimates presented in Section 5.1.1. Then several checks are done to test the validity of the instrumental variable used in the analysis.

5.1.3.1 IV estimates of the impact of term-time working

This section presents the IV estimates of the impact of term-time working on students' average course score. Specifically, the following models are estimated with the Two-Stage-Least-Squares (2SLS) regression:

$$1^{st}\ stage:\ W_i = v_0 + v_1 IV_i + v_2 X_i + \varsigma_i$$

……………………..……….. (5.1)

$$2^{nd}\ stage\text{: } A_i = \omega_0 + \omega_1 \widehat{W_i} + \omega_2 X_i + \zeta_i$$

where A_i is the average course score in college, W_i is a measure of term-time working, and X_i is the covariate set specified in Equation 3.2. The instrumental variable used in the first stage is the percentage of term-time working students in the institution. The estimated coefficient of $\widehat{W_i}$, i.e. ω_1, represents the impact of term-time working on the average course score in college.

The results of the second stage regressions are presented in Table 5.4. Columns 1 to 4 show the estimated impacts of participation, lengths, intensity, and total amount of term-time working respectively. As shown in the table, the coefficients of all these measures are statistically significant. Holding other things constant, participation in term-time working decreases the average course score by about 8.25 points, one more months worked during term time decreases the average course score by about 0.50 points, one more hour worked per week decreases the average course score by 0.39 points, and one more full-time equivalent working day accumulated in term time decreases the average course score by 0.064 points. To compare the magnitude of the impacts of lengths, intensity, and total amount, the coefficient of each variable is multiplied by the sample mean of the corresponding variable.[19] The products are shown in Table 5.4 under corresponding variables. They represent the differences in average course score between students who never worked during term time and students who worked at the average

[19] The means of length, intensity, and total amount used here are the means of the analytic sample used in corresponding regressions.

levels of length, intensity, and total amount of term-time working. Compared to that of students who never worked in term time, the average course score is about 2.9 points lower for those who worked at the average level of length, about 8.7 points lower for those who worked at the average level of intensity, and about 4.0 points lower for those who worked at the average level of accumulated days. The difference between non-working students and those who worked at the average level of intensity is the largest and is very close to the estimated impact of participation in term-time working. This suggests that the impact of participation in term-time working on academic performance mainly exerts through the impact of working intensity.

The direction of the impact revealed by the IV estimates is consistent with the conclusion from the OLS and PSM estimates and the prediction of the student involvement theory. However, the effect sizes of the IV estimates are much larger than those of the OLS estimates. For instance, IV estimate shows that participation in term-time working decreases the average course score by about 1.2 standard deviation; whereas the effect size of the OLS estimate is about 0.087. Also the IV estimate shows that one standard deviation increase in the hours worked per week during term-time decreases students' average course score by 0.88 standard deviation; whereas the effect size of the OLS estimate on working intensity is about 0.05. Possible reasons for this large IV effect size will be discussed after checking the validity of the IV strategy.

In addition, in order to examine the heterogeneous effect revealed by the OLS and PSM estimates, subsample analysis by elite and non-elite institutions is conducted with the IV strategy. The results are shown in Panel 2 of Table A4.1 in Appendix 4. Both the coefficients on term-time working are statistically significant and negative, and the difference in magnitude is not statistically significant (t-value=0.40). So the heterogeneous effect revealed by the OLS and PSM strategies is not supported by the IV strategy, though the absolute magnitude of impact for the non-elite institution sample is larger than that for the elite institution sample. The IV estimates indicate that, for students who work only to follow others, their academic performance would be negatively influenced by term-time working no matter whether they are in the elite or non-elite institutions. This difference between the IV analysis and previous analysis suggests that term-time working students' motivation is important for their academic performance. The heterogeneous effect by elite and non-elite institutions as revealed by the OLS and PSM strategies mainly reflects the different impact of term-time working on students with different levels of motivation.

Table 5.4 IV estimates of the impact of term-time working on academic achievement (Dependent variables: average score in college)

	(1)	**(2)**	**(3)**	**(4)**
	Participation	**Length**	**Intensity**	**Accum. Days**
Ever worked during term time	-8.251*			
	(3.289)			
Total months worked during term time		-0.498*		
		(0.211)		
sample mean		5.849		
coef*sample mean		-2.913		
Average hours worked per week during term time			-0.387*	
			(0.169)	
sample mean			22.525	
coef*sample mean			-8.717	
Accumulated full-time equivalent working days during term time				-0.0642*
				(0.0251)
sample mean				62.536
coef*sample mean				-4.015
Age	0.255	0.213	0.213	0.331
	(0.179)	(0.174)	(0.209)	(0.205)
Female	2.764***	2.381***	2.873***	2.552***

	(0.405)	(0.364)	(0.527)	(0.429)
Minority	-1.017	-0.697	-1.092	-1.266+
	(0.737)	(0.662)	(0.799)	(0.679)
From municipalities	-1.206+	-1.702**	-0.534	-1.566*
	(0.695)	(0.612)	(1.028)	(0.686)
From central or west area	-0.149	-0.391	-0.211	-0.252
	(0.451)	(0.429)	(0.489)	(0.424)
From rural area	0.316	0.397	0.239	0.358
	(0.422)	(0.447)	(0.571)	(0.550)
Single child	-0.175	0.344	0.0931	0.466
	(0.425)	(0.351)	(0.484)	(0.393)
SES score	-0.694**	-0.612**	-0.527+	-0.668**
	(0.219)	(0.215)	(0.274)	(0.240)
Student leader in senior high school	1.150***	1.232***	0.925*	0.877*
	(0.314)	(0.338)	(0.399)	(0.347)
Humanity track in high school	0.496	0.622	1.423+	0.963
	(0.496)	(0.517)	(0.760)	(0.588)
Arts or athlete student in high school	1.670	2.214*	2.323+	2.351*
	(1.098)	(1.047)	(1.296)	(1.191)
NCEE score (rescaled to 1~100)	0.0225	0.0574*	-0.00772	0.0244
	(0.0339)	(0.0284)	(0.0466)	(0.0340)
Science or Engineering major	-1.298*	-0.599	-0.597	-0.0986
	(0.518)	(0.548)	(0.686)	(0.666)
Economics or Management major	-0.758	-0.239	0.796	0.485
	(0.550)	(0.579)	(0.862)	(0.672)
Preference degree of one's major	1.191***	1.139***	1.265***	1.132***
	(0.195)	(0.194)	(0.244)	(0.214)
Hours spent per week on studying after class	0.0370*	0.0430*	0.0163	0.0284
	(0.0157)	(0.0178)	(0.0238)	(0.0209)
Have a minor	1.533**	1.111*	2.657**	1.654*
	(0.578)	(0.564)	(1.008)	(0.667)
Party member	0.981**	1.359***	0.534	1.154**
	(0.354)	(0.331)	(0.541)	(0.381)
Student leader	0.746*	0.442	0.703	0.597
	(0.354)	(0.374)	(0.474)	(0.420)
Have merit-based aid	4.486***	4.378***	4.424***	4.671***
	(0.381)	(0.357)	(0.441)	(0.405)
Have need-based aid	1.079**	1.127*	1.106*	1.245**
	(0.372)	(0.439)	(0.494)	(0.448)
Have loan	0.293	0.467	-0.420	0.411
	(0.415)	(0.482)	(0.447)	(0.452)
Comprehensive institutions	0.257	0.162	0.110	-0.189
	(0.418)	(0.440)	(0.566)	(0.515)
Engineering-concentrated institutions	-1.514**	-1.579***	-2.025**	-2.212***
	(0.468)	(0.478)	(0.674)	(0.629)
"985" institution	-0.0271	-0.160	-0.204	-0.276
	(0.497)	(0.471)	(0.624)	(0.532)

"211" institution	-0.0825	0.145	-1.081*	-0.0991
	(0.309)	(0.335)	(0.550)	(0.325)
Independent college	0.600	1.008	1.149	1.470
	(0.960)	(0.894)	(1.086)	(0.974)
Institution located in municipalities	0.764	0.594	2.279*	1.427+
	(0.595)	(0.571)	(1.073)	(0.755)
Institution located in central or west area	-0.167	0.252	0.414	0.196
	(0.577)	(0.523)	(0.573)	(0.542)
Campus located in suburban	-0.356	-0.682*	0.530	-0.463
	(0.344)	(0.325)	(0.636)	(0.384)
% of low-SES students in the institution	-5.235*	-7.505**	0.976	-3.935
	(2.652)	(2.801)	(4.946)	(3.712)
Constant	72.62***	67.18***	73.49***	66.48***
	(4.860)	(4.812)	(6.304)	(5.260)
N	5053	4898	4675	4590
R-squared	0.101	0.173	.[20]	.
adj. R-squared	0.093	0.165	.	.

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Missing dummies are included in all models
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

5.1.3.2 Validity of the instrumental variable

As discussed in Section 3.3.2.3, there are three conditions for a valid instrumental variable: the correlation requirement, the conditional independence assumption, and the exclusion restriction (Angrist & Pischke, 2009, p.117,152–153). This section examines the three requirements for the instrumental variable used to identify the impact of term-time working, i.e. the percentage of term-time working students in the institution.

[20] The missing R-Squared in some IV model indicates a negative value. This is because the Total Sum of Squares (TSS) and the residual (error) sum of squares (RSS) of the 2SLS estimation are computed over different sets of regressors and the RSS is no longer constrained to be smaller than the TSS. (Source: http://www.stata.com/support/faqs/statistics/two-stage-least-squares/)

The first condition requires that the instrumental variable have a clear and strong effect on the treatment status. This requirement can be examined with statistics from the first-stage regressions. Table 5.5 presents the first-stage coefficients of the instrumental variable on each measure of term-time working, the significance level of the Hausman test of the endogeneity of the treatment variable, the Kleibergen-Paap Wald rk F-statistics for the weak IV test[21], and the significance level of the weak-instrument robust Anderson-Rubin test.

As shown in the table, the Hausman tests are all significant at 0.05 level, suggesting that term-time working is endogenous to students' average course score and it is necessary to address this problem. The first stage coefficients are all statistically significant. The magnitudes of the coefficients seem to be small. 1 percentage point increase in the instrumental variable leads to an increase of about 0.5 percentage points in the probability of participation in term-time working, an increase of 0.08 months and 0.7 days worked in term-time, and an increase of 0.1 hours worked per week in term time. The percentage of term-time working students in each institution ranges from 25% to 83.24% with a mean of 58.47% and a standard deviation of 10.64. One standard deviation increase in the instrumental variable increases the probability of participation by 5.32 percentage points, and increases the length by 0.14 standard deviation, the intensity by 0.07 standard deviation, and the total amount by 0.10 standard deviation.

[21] The common weak identification test is the Cragg-Donald F statistics (Stock, Wright, & Yogo, 2002). However, this analysis no longer satisfies the Independently and Identically Distributed (i.i.d.) assumption because sampling weight is included in regression. In this case, the Cragg-Donald F statistics is no longer robust; instead, a Kleibergen-Paap Wald rk F-statistics is used in the weak identification test. This statistics is automatically reported by the _ivreg2_ procedure in Stata 12 when robust standard errors are requested.

Most F-statistics are far above 10, which is the rule of thumb for weak-identification test suggested by Staiger and Stock (1997). The smallest F-statistic (10.05) is found in the model with intensity of term-time working. The Anderson-Rubin (1949) test examines whether there is an impact of the endogenous variable on the outcome variable. It is robust to weak instrumental variable. The null hypothesis of the test is that the coefficient of the endogenous variable in the second-stage regression is not statistically significantly different from zero. In all the models, the null hypothesis is rejected at the significance level of 0.05, suggesting that all term-time working measures have significant impacts on students' average course score in college. Overall, the problem of weak instrumental variable is not severe in this analysis.

Table 5.5 IV first-stage regression outputs
(Endogenous variable as the dependent variable)

	(1)	(2)	(3)	(4)
Endogenous variable:	**Participation**	**Length**	**Intensity**	**Accum. days**
IV: % of term-time working students	0.00487***	0.0779***	0.117**	0.716***
	(0.000672)	(0.0114)	(0.037)	(0.147)
N	5,053	4,898	4,675	4,590
R-sq	0.171	0.169	0.098	0.122
Wu-Hausman F-stat p-value	0.000	0.000	0.000	0.000
Kleibergen-Paap Wald rk F-stat	28.84	46.69	10.05	23.84
Anderson-Rubin Chi-sq p-value	0.004	0.006	0.001	0.001

Notes: 1. Sampling weights are applied;
2. Robust standard errors in parentheses;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.
4. Covariates included in the 2nd stage regressions are also included in the 1st stage.

The second assumption requires that the instrumental variable is independent of both the potential outcomes and potential treatment assignment after controlling for covariates, and the third assumption requires that the only channel for the instrumental variable to influence the outcome variable is mediated through the first stage (Angrist & Pischke, 2009, p.117,152–153). Unfortunately, these assumptions are not directly testable. Instead, this study first discusses potential threats to the second and third conditions, and then conducts some falsification tests to examine the credibility of the instrumental variable.

There are three major threats to the validity of the instrumental variable. The first is that the percentage of term-time working students in one's institution may not be exogenous to the potential treatment status, because students are able to choose which college to attend. The high percentage of term-time working students in an institution may be a result of, for instance, an institutional policy that encouraging working and/or more working opportunities in that institution. If students who plan to work in term time intentionally choose to attend such an institution, the instrumental variable is no longer exogenous to students' term-time working decision.

The second threat is that the instrumental variable may not be exogenous to the potential outcome, i.e. the average course score. Institutions with more term-time working students may be systematically different from those with fewer term-time working students. For instance, they may have less demanding academic requirements, so that students have more time to spend on working. The average course score in institutions with less demanding academic requirements might be systematically higher than the average course score in other institutions. There may also be some unobservable factors that influence the percentage of term-time working students in an institution, while at the same time influence the academic performance of all students in that institution. In these cases, the instrumental variable is no longer exogenous to students' potential average course score.

The third threat is that the percentage of term-time working students may influence students' academic performance through other unobservable ways. The instrumental variable measures the institutional climate of working in term time. It is possible that the positive institutional attitude towards term-time working reflects an institutional depreciation of academic success. Students in such institutions may place less emphasis on studying, no matter whether or not they work in term time, and therefore obtain lower average course scores. In this case, the exclusion restriction is violated.

The first threat is not a serious problem because institutional policy and climate of term-time working is not a common concern in students' college choice in China. As shown by the Chinese literature, the most important factors that students consider in college choice are academic majors provided in an institution, academic ranking and quality of an institution, placement of graduates, institution location, and admission threshold of the NCEE score (H. Deng, 2009; Zituan Liu, 2009; Xiao & Pu, 2010; Xue, 2010). None of the studies found the institutional policy or climate of term-time working to be an important factor of college choice. The study by Deng (2009) asked students to rate the level of importance of 20 factors which measure college quality and activities in their college choice decision. He found that the amount of work-study opportunities was one of the "unimportant factors". The CSLM 2011 survey used in this study also asked students about the factors they considered in college choice. The findings are similar with previous studies. 68.2% of the whole sample considered academic majors and programs to the be an important factor when they selected college, 49.4% considered academic ranking of an institution to be important, 45.0% considered location of the institution to be important, and 18.6% considered the cost of attendance to be important.

Overall, available evidence suggests that the instrumental variable is very likely to be exogenous to students' college choice decision and therefore independent to their potential term-time working status.

The second threat is that there might be systematic differences in the average course score between institutions with more term-time working students and institutions with fewer term-time working students. To address this problem, the potential source of variation in the IV is explored by regressing it on aggregated institutional level variables. The explanatory variables include institutional characteristics such as academic ranking level, concentration, region, and campus location, and aggregated institutional data including average cost of attendance as measured by average tuition charged to students, average NCEE score of the Cohort 2007 students, average hours spent in class, percentage of students who do not like their major, and percentage of low-SES students. The results are shown in Column 1 of Table 5.6. The R-squared of the model fit is 0.659, suggesting that these institutional factors together can explain 65.9% of the variation in the percentage of term-time working students. Specifically, the percentage of term-time working students in an institution is statistically significantly associated with the percentage of low-SES students in that institution, being an engineering-concentration institution, and being an independent institution.

In order to identify factors that influence both the percentage of term-time working students and the average level of student academic performance in the institution, the mean average course score of the institution is regressed on the same set of explanatory variables. The results are presented in Column 2 of Table 5.6. The R-squared is 0.624, suggesting that the model explains 62.4% of the total variation in the mean average course score across institutions. Specifically, the mean average course score in an institution is statistically significantly associated with the percentage of low-SES students in that institution, the percentage of students who do not like their major, average hours spent in class, and being an engineering-concentration institution. Factors that influence both the percentage of term-time working students and institutional mean average course score are the percentage of low-SES students and being an engineering-concentrated institution. These factors are already included in previous models used in the IV analysis. Furthermore, in Column 3 of Table 5.6, the percentage of term-time working students is included as an explanatory variable for the mean average course score. The coefficient is not statistically significant, indicating that there is no significant association between the percentage of term-time working students and mean average course score after controlling for other institutional characteristics. Overall, the above results suggest that the IV is very likely to be exogenous to the potential outcome after controlling for covariates.

Table 5.6 Source of variation in the instrumental variable

	(1)	**(2)**	**(3)**
Dependent variable:	**IV**	**Mean ave.score**	**Mean ave.score**
% of term-time working students (IV)			-2.321
			(1.756)
% of low-SES students	0.484*	-7.653*	-6.530+
	(0.193)	(3.263)	(3.613)
% of students who don't like major	0.415	-27.11**	-26.15**
	(0.772)	(8.389)	(8.324)
Average tuition	-6.22E-06	-0.000146	-0.000160+
	(7.06E-06)	(9.43E-05)	(9.47E-05)
Average NCEE score	6.82E-05	0.00403	0.00419
	5.57 E-05)	(0.00932)	(0.00948)
Average hours spent in class	0.00745	0.293*	0.310*
	(0.00604)	(0.125)	(0.120)
"985" institution	-0.0168	1.878+	1.839+
	(0.0668)	(1.081)	(1.081)
"211" institution	-0.0229	1.130	1.076
	(0.0448)	(0.769)	(0.779)

Independent college	-0.123*	2.890	2.604
	(0.0558)	(1.791)	(1.905)
Comprehensive institutions	-0.0710	-0.866	-1.031+
	(0.0610)	(0.574)	(0.519)
Engineering-concentrated institutions	-0.194***	-1.599*	-2.050**
	(0.0525)	(0.727)	(0.664)
Institution located in east area	0.101+	-0.554	-0.319
	(0.0517)	(0.649)	(0.722)
Institution located in central or west area	0.0340	-0.0679	0.0110
	(0.0401)	(0.529)	(0.527)
Campus located in suburban	-0.00499	1.210	1.198
	(0.0705)	(0.800)	(0.773)
Constant	0.449+	75.16***	76.13***
	(0.257)	(5.819)	(6.090)
N	6,977	6,977	6,977
R-sq	0.659	0.624	0.631
adj. R-sq	0.659	0.623	0.631

Notes: 1. Sampling weights are applied;
2. Robust standard errors in parentheses are clustered at the institutional level;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

The third threat to the validity of the IV is that there might be a third path for the IV to influence students' average course score. As discussed before, the most possible third path is through the influence on students' attitude towards academic performance. Students attending an institution with high percent of term-time working students may place less emphasis on studying, and therefore have a low average course score no matter whether they work in term time. Two falsification tests are done to test whether this is true. The basic idea is to examine the impacts of the IV on other academic outcomes that may not be influenced by term-time working. The results are presented in in Table 5.7.

Table 5.7 Falsification tests of the exclusive conditions

	1st test	**2nd test**	
Dependent variable:	**(1) CET4 score**	**(2) Ever failed a course**	**(3) Number of courses failed**
1) term-time working participation	1.257	0.0397+	0.0783
	(2.825)	(0.0212)	(0.0680)
N	4,950	6,203	6,016

R-sq	0.253	0.188	0.228
2) length of term-time working	0.0547	0.00297	0.00599
	(0.200)	(0.00207)	(0.00514)
N	4,786	5,986	5,810
R-sq	0.256	0.185	0.227
3) intensity of term-time working	-0.0614	0.00119+	0.00138
	(0.0715)	(0.000651)	(0.00182)
N	4,594	5,729	5,560
R-sq	0.256	0.196	0.231
4) IV: % of term-time working students	0.0149	-0.000994	-0.00259
	(0.115)	(0.00103)	(0.00307)
N	4,950	6,874	6,654
R-sq	0.253	0.182	0.225

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. The models for "ever failed a course" are measured with probit regression. The R-squared reported are pseudo R-squared.
4. Full set of covariates and missing dummies are included in each model.

The academic outcome used in the first test is the score of the CET-4 exam. As mentioned previously, CET-4 is a national standardized English test. Most universities and colleges require their undergraduate students to take the exam before graduation. The exam is held twice a year, and students can decide when to take it. Therefore the score may not be influenced by term-time working, as students can adjust both the exam schedule and their working behaviors. On the other hand, the score may reflect students' attitude towards the exam and effort devoted to the preparation, as students could have as much time as they want to prepare for the exam. Therefore if attending an institution with more term-time working students decreases individual students' level of emphasis on academic performance, there would be a negative correlation between the IV and CET-4 score. Column 1 in Table 5.7 presents the regression results of four models using CET-4 score as the dependent variable. The key explanatory variables are the participation, length, and intensity of term-time working, and the percentage of term-time working students respectively. The covariate set used in previous analyses is included in each model. As shown in the table, none of the coefficient is statistically significant. This suggests that term-time working does not influence students' CET-4 score, nor does the percentage of term-time working students in the institution.

The CET-4 score is a measure of English proficiency rather than the overall academic performance in college. As English skill is highly valued in the labor market in China, it is possible that students who do not care about college academic performance still care about their CET-4 score. Then the above results just indicate that the IV does not influence students' attitude towards English, but provide no evidence on whether the IV influence students' level of emphasis on the overall academic performance in college. Therefore two alternative measures of the overall academic performance are used in the second falsification test.

The variables used in the second test are whether the student ever failed a course in college, and the total number of courses failed. Presumably, term-time working may be positively associated with the probability of ever failed a course, as previous analyses show that it has a negative impact on academic performance. But it may not influence the number of courses failed, as students who care about academic performance would adjust their working behavior after failing a course to avoid failing more. If the percentage of term-time working students in an institution decreases individual students' level of emphasis on academic performance, it would have a positive association with the number of courses failed. Column 2 and 3 in Table 5.7 present the regression results of models. As in the first test, the key explanatory variables are the participation, length, and intensity of term-time working, as well as the percentage of term-time working students. The covariate set used in previous analyses is included in each model.

As shown in the table, there are some marginally significant positive associations between ever failed a course and the participation and intensity of term-time working, but no statistically significant correlations between the number of courses failed and term-time working. This is consistent with the expectation. None of the coefficients on the IV is statistically significant, suggesting that the IV does not influence whether ever failed a course, nor the number of courses failed. Overall, the falsification tests provide no evidence of the existence of the proposed third path for the IV to influence students' average course score.

In summary, evidence provided in this section suggests that the percentage of term-time working students in the institution is in general a valid instrumental variable. It has acceptable correlations with the endogenous variables and arguably meets the independence assumption and exclusion restriction. Therefore the IV estimates of the causal impact presented in the previous section are credible. The larger effect sizes of the IV estimates suggest that the OLS estimates are upward biased because of the positive self-selection into term-time working. As suggested in Chapter 4, more motivated students are more likely to work in term time. Therefore the negative impact of term-time working is underestimated by the naïve OLS estimates. This direction of bias is consistent with the conclusions from the PSM analysis. Another explanation of the large IV estimates is that it only reveals the Local Average Treatment Effect (LATE) on students whose term-time working status is influenced by the instrumental variable, i.e. the institutional climate of working during term time. These students may be different from other students, as initially they do not have a clear incentive of working or not working in term time. Those who are induced to work in term time by their peers may be less willing to study after work than highly motivated working students, or less able to balance studying and working than more capable students. Therefore their academic performance may be more vulnerable to the negative impact of term-time working. So the large IV estimate might reflect a heterogeneous effect of term-time working by students' motivation and ability. This is very possible as the subgroup analysis by elite and non-elite institution presented in previous sections suggest that students' motivation plays an important role in determining the impact of term-time working on students' academic performance. However, as it is not possible to identify the affected sample with available information, it is hard to decide whether the above speculations about this sample are correct or not. Therefore it is not clear whether the IV estimates of the impacts of term-time working on academic performance are generalizable to all term-time working students.

5.1.4 Impact of different forms of term-time job

The forms of job taking during term-time may influence students' academic performance in different ways because they have different characteristics. With regards to the location of workplace, work-study jobs are provided by the institution and are usually on-campus; whereas part-time jobs and internships are more likely to off-campus. With regards to the job content, work-study jobs and part-time jobs are more likely to be low-skilled job that are unrelated to one's academic major, while internships are more likely to be formal jobs that are related to one's academic major. With regards to intensity, work-study jobs and part-time jobs are usually very flexible and can be done after class or in the weekend; while internships are usually during workdays and have a stricter schedule. As suggested by previous literature, all these job characteristics influence the impact of taking the job. This section estimates the impact of taking different forms of job in term time on academic performance.

Table 5.8 presents the OLS and IV estimates of the impacts of different forms of term-time jobs. As many students take more than one form of job, variables measuring the same aspect (i.e. participation, length, and intensity) of each form of job are included in the same model. In this case, there are three endogenous variables in a model and therefore requires three instrumental variables. The instrumental variables used in the models are the percentages of students taking work-study jobs, part-time jobs, and internships respectively. The same set of covariates as specified before is used in each model.

Columns 1 and 2 in Table 5.8 show the estimates of the impacts of participation in different forms of job. In Column 3, the participation is broken down into more categories to take into account the number of job forms taken by a student. Columns 4 and 5 show the impacts of the length of each form of term-time working experience; and Columns 6 and 7 show the impacts of the intensity of each form of job. The reference group for Models 1 to 3 is students who never worked in term time. In Models 4 to 7, a value of 0 is assigned to the length and intensity of each form of job for those who never worked in term time.

Table 5.8 Impact of different forms of term-time job on academic performance (full sample) (Dependent variables: average score in college)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Participation in different forms of job			**Lengths of different forms of job**		**Intensity of different forms of job**	
	OLS	**IV**	**OLS**	**OLS**	**IV**	**OLS**	**IV**
Ever took work-study jobs in term time	0.528	1.628					
	(0.336)	(3.052)					
Ever took part-time jobs in term time	-0.404	-1.784					
	(0.268)	(3.825)					
Ever took internships in term	-0.776**	-13.50*					

time	(0.256)	(5.341)					
Only took work-study jobs in term time			0.597				
			(0.499)				
Only took part-time jobs in term time			-0.590				
			(0.406)				
Only took internships in term time			-0.972**				
			(0.365)				
Took work-study and part-time jobs in term time			-0.0111				
			(0.572)				
Took work-study jobs and internships in term time			-0.288				
			(0.786)				
Took part-time jobs and internships in term time			-0.998*				
			(0.462)				
Took all three forms of jobs in term time			-0.800				
			(0.627)				
Total month of term-time work-study jobs				0.0172	0.447		
				(0.0284)	(0.473)		
Total month of term-time part-time jobs				-0.0386	-0.818		
				(0.0374)	(0.711)		
Total month of term-time internships				-0.0502	-1.917**		
				(0.0504)	(0.738)		
Average hours of term-time work-study jobs						-0.00467	0.269
						(0.0175)	(0.233)
Average hours of term-time part-time jobs						-0.0270*	-0.00635
						(0.0108)	(0.323)
Average hours of term-time internships						-0.0202**	-0.391*
						(0.00694)	(0.167)
N	5,044	5,044	5,044	4,804	4,804	4,408	4,408
R-square	0.314	.	0.314	0.320	.	0.333	.
IV tests							
Weak IV test F-stat for ttws		21.44			7.59		10.73
Weak IV test F-stat for ttpt		26.35			5.67		5.42
Weak IV test F-stat for ttintern		9.42			13.79		7.42
Wu-Hausman F-stat p-value		0.000			0.000		0.000
Anderson-Rubin Chi-sq p-value		0.000			0.000		0.000

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. Three instrumental variables are used in the IV models. They are the percentages of students who ever took work-study jobs, part-time jobs, and internships in the institution;
4. Full set of covariates is included in each model.

As shown in the table, taking work-study jobs and part-time jobs during term time is not statistically significantly associated with the average course score, while taking internships during term time is negatively correlated with the average course score. The estimated coefficient on work-study jobs is not statistically significant in any model. The coefficients on term-time part-time jobs are not statistically significant in models estimated with IV 2SLS, but the OLS estimate of the impact of part-time jobs intensity is statistically significant and negative (in Column 6). As for term-time internships, all coefficients are statistically significant and negative, except the OLS estimate of the impact of internship length (in Column 4). In addition, the magnitudes of the estimated impacts of term-time internships are larger than the magnitudes of the impacts of overall term-time working. These results suggest that different forms of jobs taken in term time have different impact on students' academic performance, and the negative impact of working in term time exerts mainly through the impact of internships. The same conclusion achieves when taking into account the number of jobs taken during term time. As shown in Column 3, compared to students who never worked in term time, students who only took work-study or part-time jobs in term time have similar average course score, but those who only took internships have a statistically significantly lower average course score. Among students who have taken more than one form of job, their average course score is not statistically significantly different from that of non-term-time working students if they have ever taken work-study jobs.

As shown in the bottom of Table 5.8, the instrumental variables used in the models are not strong enough in some models. The F-statistics are just above 10 or even below 10 in some cases. Therefore the IV estimates may not be consistent. As a robustness check, three subgroup analyses are done with students who took only one form of jobs during term time. The same comparison group is used in each subgroup analysis, which consists of students who never worked in term time. The results are presented in Table 5.9. As shown in table, the weak-instrument problem is not as severe as in the analysis with the whole sample. Most of the F-statistics are greater than 10. In models with an F-statistic around or below 10, the weak-instrument robust Anderson-Rubin tests suggest that the IV estimates provide correct inference about the significance level of the impact.

The findings from the subgroup analyses are mostly consistent with the previous whole sample analysis. The participation, length, and intensity of term-time work-study jobs do not significantly influence students' academic performance. Yet it is worth noting that the IV estimates are all positive and sometimes marginally significant. This suggests that taking work-study jobs during term time may have a potential positive influence on students' average course score. On contrary, taking internships during term time significantly decreases students' average course score. The OLS and IV estimates are all statistically significant and negative. As for taking part-time jobs in term time, the finding from subgroup analysis is different from findings from the whole sample. The whole sample analysis suggests that taking part-time jobs in term time does not influence students' academic performance, but the IV estimates in the subsample analysis show that taking part-time jobs also has a statistically significant and negative impact on students' average course score. In addition, the magnitude of the IV estimates for participation and intensity of part-time jobs are larger than that of internships, suggesting that the impact of taking part-time jobs on academic performance is more negative than taking internships. This finding is understandable because part-time jobs are more likely to be low-skill and labor-intensive jobs, while internships are more likely to be high-skill jobs that are relevant to one's academic major.

Table 5.9 Impact of different forms of term-time job on academic performance (subgroups)
(Dependent variable: average course score)

Subgroups by form of job	Endogenous variable	Main result		IV 1st-stage outputs			Model fit		
		OLS	IV 2nd-stage	coef. of IV	Weak-IV tests			N	R-sq
(1) Work-study jobs (IV: % of students taking work-study jobs)	**Participation**	0.404	5.968+	0.00878***	K-P Wald rk F-stat	24.67	**OLS**	1,927	0.341
		(0.501)	(3.506)	(0.00177)	A-R Chi-sq p-value	0.072	**IV**	1,927	0.263
	Length	-0.0408	1.225	0.0413**	K-P Wald rk F-stat	8.00	**OLS**	1,909	0.345
		(0.0369)	(0.817)	(0.0146)	A-R Chi-sq p-value	0.086	**IV**	1,909	.
	Intensity	-0.00705	0.411	0.130**	K-P Wald rk F-stat	11.10	**OLS**	1,887	0.345
		(0.0255)	(0.259)	(0.0389)	A-R Chi-sq p-value	0.071	**IV**	1,887	0.165
(2) Part-time jobs (IV: % of students taking part-time jobs)	**Participation**	-0.737+	-10.33**	0.00796***	K-P Wald rk F-stat	27.70	**OLS**	2,365	0.302
		(0.398)	(3.248)	(0.00152)	A-R Chi-sq p-value	0.000	**IV**	2,365	.
	Length	-0.0381	-1.553*	0.0530**	K-P Wald rk F-stat	11.92	**OLS**	2,297	0.299
		(0.0466)	(0.611)	(0.0154)	A-R Chi-sq p-value	0.000	**IV**	2,297	.
	Intensity	-0.0332*	-0.477*	0.156**	K-P Wald rk F-stat	10.96	**OLS**	2,240	0.302
		(0.0148)	(0.195)	(0.0472)	A-R Chi-sq p-value	0.001	**IV**	2,240	.
(3) Internships (IV: % of students taking internships)	**Participation**	-1.249***	-9.955***	0.00823***	K-P Wald rk F-stat	27.55	**OLS**	2,453	0.308
		(0.357)	(2.737)	(0.00159)	A-R Chi-sq p-value	0.000	**IV**	2,453	.
	Length	-0.139+	-1.856**	0.0442***	K-P Wald rk F-stat	22.68	**OLS**	2,434	0.301
		(0.0722)	(0.571)	(0.00929)	A-R Chi-sq p-value	0.000	**IV**	2,434	0.031
	Intensity	-0.0221*	-0.396**	0.240***	K-P Wald rk F-stat	15.44	**OLS**	2,334	0.301
		(0.00959)	(0.125)	(0.0613)	A-R Chi-sq p-value	0.000	**IV**	2,334	.

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. Full set of covariates and missing dummies are included in each model.

Overall, the above analyses find that different forms of term-time working have different impacts on students' academic performance. Taking work-study jobs in term time does not influence students' academic performance, while taking part-time jobs and internships negatively influence students' academic performance. This finding can be explained by the student engagement theory which suggests that students' academic performance is influenced by their level of engagement with the institution. As work-study jobs are mostly on campus, taking these jobs provides students with more opportunities to get involved in college activities and interact with faculty and peers. The negative impact of working during term time might be cancelled out by the positive impact of improved level of engagement. On contrary, taking off-campus part-time jobs and internships deprives such opportunities, and therefore the impact of working might be more negative. This is consistent with previous U.S. empirical studies, which find that on-campus working do not hinder students' academic performance, while off-campus working often exerts a negative impact on it. Another possible explanation is that work-study jobs are less demanding than part-time jobs and internships in terms of working hours and job content, and therefore have less negative impact on studying. This is very possible as many work-study positions are in libraries, labs, and dorms; and the sample mean of average hours worked per week for work-study jobs (13.0 hours/week) is smaller than the means for part-time jobs (17.7 hours/week) and internships (31.8 hours/week).

5.1.5 Robustness check: missing value in average course score

As described in Section 3.4.1.3, the overall missing value problem is not severe in this data and missing values in covariates are treated with the Dummy Flag strategy. However, the outcome variable in this analysis has a missing rate of about 22%.

Observations with missing values in the outcome variable are dropped from above analysis, reducing the sample size by about one-quarter. There is a concern that the missing values in average course score might be systematically different from the reported values. For instance, students with lower scores might be more likely to not to report their scores in the survey. In other words, the missing of average course score may not be at random. This would bias the estimation of the impact of term-time working. To address this issue, a dummy variable indicating whether the average course score is missing is regressed against term-time working participation and the full set of covariates specified in Equation 3.2. This is a check of whether participation in term-time working has an association with missing in average course score, as well as a check of differences in covariates between those who reported average course score and who did not. The model is predicted with probit regression and variables with significant coefficients are presented in Table 5.10.

As shown in the table, term-term working participation is statistically significantly associated with missing in average course score. Students who did not work in term time are more likely to have a missing average course score. This means that there are more missing observations in the control group than in the treatment group. If lower scores were more likely to be missing, the mean of the control group would be more severely overestimated than the mean of the treatment group, and the estimated impact of term-time working on average course score would be downward biased. In the same logic, if higher scores were more likely to be missing, the estimated impact of term-time working would be upward biased.

Coefficients on the other covariates provide some clues of whether the missed average course scores would be in general high or low scores. As shown in the table, female students and students from institutions with higher percent of low-SES students are more likely to have missing values in average course score. Students with merit-based aid and need-based aid, and students in "211" institutions (compared to those in non-key institutions) are less likely to have missing average course score. As revealed in Table 5.1, the average course score is positively associated with being female and having merit-based or need-based financial aid, and negatively associated with the percentage of low-SES students. Attending "211" institutions is not significantly associated with average course score. This in general suggests that lower average course scores are more likely to be missing, though the coefficients on gender suggest the opposite. In this case, it is possible that the estimated impact of term-time working on average course score is downward biased, and the magnitude of the negative impact is overestimated.

Table 5.10 Missing in average course score

Significant predictors	**(1) Probit**
Term-time working participation	-0.189**
	(0.0668)
Female	0.202**
	(0.0672)
NCEE score	-0.00862+
	(0.00462)
Have merit-based aid	-0.188**
	(0.0711)
Have need-based aid	-0.208*
	(0.0846)
% of low SES students in institution	1.388**
	(0.400)
"211" institution	-0.211**
	(0.0676)
No. of observation	6,262
Pseudo R-squared	0.119

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. Full set of covariates and missing dummies are included in each model.

5.1.6 Summary of quantitative analysis

The quantitative analysis presented in this section estimates the impact of term-time working on academic performance with OLS, PSM, and IV strategies. In general, it finds that term-time working has a significant and negative impact on students' academic performance. This finding is contradictory to previous descriptive studies in China which found that working does not influence students' academic performance, but is consistent with prediction of the student involvement theory by Astin (1984).

The OLS estimates suggest that term-time working has a statistically significant and negative association with the average course score, but the magnitude is small (less than one-tenth of a standard deviation). The participation of term-time working is associated with a decrease of 0.59 point in average course score, and one more hour worked per week in term time is associated with a decrease of 0.022 point in average course score. The length of term-time working as measured by total months worked in term time is not associated with students' average course score. Yet, using the percentage of term-time working students in the institution as the instrumental variable, the IV estimates find that all the four measures of term-time working, i.e. the participation, length, intensity, and total amount are significantly and negatively associated with students' average course score. Working during term time decreases students' average course score by about 8.25 points; one more hour worked per week decreases average course score by about 0.4 points; and one more month worked during term time decreases average course score by about 0.5 points. The effect size of the IV estimates is much larger than the OLS and

PSM estimates, suggesting that failing to address for the endogeneity problem would upward bias the estimates of the impact of term-time working on average course score. However, the IV estimates only reveal the impact on students whose term-time working decision has been influenced by the instrumental variable, i.e. students who follow the common trend of term-time working in their institution. This group of students may be different from other students in unobserved ways. Therefore the large IV estimates also indicate the existence of heterogeneous effect of term-time working, and may not be generalizable to all term-time working students. In addition, the common trend of term-time working in the institution may influence students' academic performance through other paths besides participation in term-time working. This would compromise the validity of the IV estimates. Falsification tests are conducted to address this issue, and the results suggest that it is not a severe threat to the validity of the IV estimates.

Further analysis finds that the impact of term-time working varies across different forms of job taken during term time. Pooling all forms together, the IV estimates show that the negative impact of term-time working is mainly captured by taking internships in term time. Subgroup analyses, which compare students who took only one form of job during term time to those who did not work in term time, reveal similar findings. The participation, length, and intensity of taking work-study jobs in term time are not statistically significantly associated with average course score. Yet the IV coefficients are all positive, suggesting potential positive impact of taking work-study jobs on academic performance. The participation, length, and intensity of term-time internships are found to have significant and negative impact on average course score. As for the impact of taking part-time jobs during term-time, though the whole sample analysis suggests no effect, the subsample analysis finds that it has statistically significant and negative impact on academic performance, and the magnitude is larger than that of taking internships during term time. Considering the different characteristics of these working forms, it can be implied from the analysis that the impact of term-time working on academic performance may depend on the location of workplace and content of job. On-campus jobs may not harm students' academic performance, while off-campus jobs that are not relevant to one's academic major may be more detrimental to academic performance. U.S. empirical studies provide evidence that supports this conclusion, but further analysis needs to be done to in the Chinese context to test whether this is true in Chinese universities and colleges.

In addition, subsample analysis by elite and non-elite institution shows that the impact of term-time working on academic performance is more negative for students in non-elite institutions than for those in elite institutions. Both the OLS and PSM found that term-time working is not statistically significantly associated with students' academic performance in the elite institution sample, but is significantly and negatively associated with the academic performance of those in the non-elite institution sample. The IV estimates shows that the impact is significant and negative in both samples, but the absolute magnitude is larger in the non-elite institution sample than in the elite institution sample. Overall, the subsample analysis suggests that the academic performance of students in non-elite institutions is more vulnerable to term-time working than the academic performance of students in elite institutions.

Besides term-time working, analysis in this section finds that students' academic performance is influenced by some other factors. Female students and students who have higher innate ability, more positive attitude towards studying, and spend more time on studying are more likely to have higher average course score. This is consistent with previous theoretical and empirical studies. What is a little surprising is that students from better family background, i.e. students who are from more developed area (the municipalities) and have higher SES scores, tend to have lower average course score. This may because that they have less incentive to maintain good academic records in college as they face less pressure in the job market after graduation.

Finally, there is a threat to the robustness of the estimates raised by missing values in the outcome variable. Nearly one-quarter of students in the whole sample did not report their average course score, and therefore are dropped from the analytic sample. The analysis on the pattern of missing in average course score reveals that student who did not work in term time are more likely to have a missing average course score. There is also some evidence that lower scores are more likely to be missing. Therefore the estimates on the impact of term-time working presented in this section might be downward biased and the magnitude of the negative impacts might be overestimated.

5.2 Qualitative findings: students' explanation on the influence of term-time working on academic performance

The quantitative analysis presented in previous section suggests that working during term-time has a negative influence on students' academic performance. The analysis of student interview data provides some possible explanations of how term-time working influences students' academic performance. Half of the interviewees in the sample reported negative influence of term-time working on their academic performance, and the other half of interviewees reported no substantial negative influence and even positive influence. In general, the analysis reveals two possible paths through which term-time working may influence students' academic performance. The first path is directly through time allocation; and the second path is through the influence on students' attitude and commitment towards studying.

5.2.1 Path One: time allocation and management

When talking about how term-time working influenced their academic performance, 15 out of the 17 interviewees connected it to time allocation and management. Students who perceived negative influence reported reduced time and energy for studying; while students who perceived no influence either reported other sources of working time, or reported improved efficiency.

Reduced time and energy

Many interviewees mentioned that working during term time distracted them away from studying and negatively influenced their academic performance. For instance, Mr. Guang from the non-key institution who did many part-time jobs during term time said:

> *"It has some negative impacts. I have not passed the CET-6 exam so far. …… A larger (negative) influence is that I did not learn my courses well. I just have some superficial knowledge on my major."*
>
> *—Mr. Guang from the non-key institution, majoring in Chinese Literature*

Interviewees from the "985" institution also reported such a negative impact. For instance, Ms. Guo from who worked as a librarian in first semester of the sophomore year said:

"I think there are some negative impact (of term-time working on studying), especially at the end of the semester when I had to prepare for the exams. I felt very stressful during that period."

—Ms. Guo from the "985" institution, majoring in Finance

Ms. Guo worked eight hours per week. She was hoping that she could have some time to study at work, as she heard that the librarian job was not very intensive. Yet her supervisor was very strict and did not allow them to do other things during work.

Another interviewee, Mr. Hou from the "985" institution who worked as a private tutor in the freshman year and an intern in a consulting company in the third year pointed out that, the private tutoring job did not influence his academic performance because he tutored in the evening, but the internship did negatively influenced his study because he was "extremely busy". He worked for 2 to 3 full working days per week for the internship, and was at the mean time preparing for a professional certificate exam. As this term-time internship and professional certificate exam were on his agenda before the semester began, he intentionally registered for fewer and easier courses to reduce his course load. Yet, despite of this arrangement, he ended up dropping one course in the middle of the semester, and his performance in other courses was not as good as before.

In addition to the reduction of studying time, some students also pointed out that working consumes their energy. Mr. Yong from the non-key institution who started to do part-time jobs in the sophomore year said:

"With regards to studying, in the second year, I felt that my course scores were significantly lower the freshmen year. …… I did not master the knowledge in

my major domain well, nor did I read as many books as before. …… (Reduced) time is not the only reason, I think people have limited energy.”

—Mr. Yong from the non-key institution, majoring in Applied Physics

Ms. Xin from the “985” institution who took an internship during the first semester of the senior year talked about the negative influence of taking the internship on her preparation for the GRE exam:

“The internship was very demanding. I felt very tired after work and did not want to do anything but to rest when I did not work. I could not concentrate on studying, and did not do much preparation for the GRE exam.”

—Ms. Xin from the “985” institution, majoring in English Literature

Mr. Yong and Ms. Xin’s experiences suggest that taking a high demanding job consumes students’ energy and makes them too exhausted to study after work. Mr. Hou also mentioned that one reason that his course scores dropped when he was doing the internship in the consulting company was that the internship was very demanding and stressful.

<u>Other sources of working time</u>

Though many interviewees reported reduced time and energy because of working, some others pointed out that they used their leisure time but not study time to work, and therefore perceive no influence of term-time working on studying. For instance, Ms. Xiang who did private tutoring for three years in college said:

“I don’t think doing private tutoring influences my study. I worked only when I had time. …… I would not use the time to study if I had not worked. My friends

who were not working did not spend the time on studying as well, but all on leisure activities. I'd rather to take some jobs than to waste the time."

—Ms. Xiang from the non-key institution, majoring in Statistics

Some other interviewees also said that they would not use the time to study if they had not worked, and therefore did not think working had negative influence on their studying.

What is interesting is that all interviewees with such an opinion are from the non-key institution. By contrast, many interviewees from the "985" institution indicated that they would spend the time on studying if not working. For instance, Ms. Guo, who thought that working negatively influenced her studying, said that she would spend at least five out of the eight hours on studying, had she not worked. Other interviewees from the "985" institution also talked about the opportunity cost. For instance, Ms. Jing who participated in work-study jobs in the sophomore year said:

"I think I would have more options (if not working). For instance, I can use the time on studying."

—Ms. Jing from the "985" institution, majoring in Information Art & Design

The difference in the re-allocation plan of the time originally spent on working suggests that interviewees from the "985" institution and the non-key institution have different attitude towards studying. Those from the "985" institution on average worked harder than those from the non-key institution. This is as expected because students in the "985" institution are more motivated and have better academic ability than those in the non-key institution.

Improved efficiency and productivity

Some interviewees attributed the reason why term-time working did not negatively influence their academic performance to the improved efficiency. About one-third of the interviewees mentioned improved consciousness and skills of time management through working. Mr. Ming, the only interviewee without term-time working experience, talked about the gain from a summer internship and his plan if he could start over again in college:

> *"The internship helped me to beat procrastination and improved my efficiency. I think I have wasted too much time in college. …… I was not very productive (on studying). …… If I could do college again, I would reduce the unproductive studying time and use it to do some part-time jobs and internships, and participate in school activities."*
>
> *—Mr. Ming from the "985" institution, majoring in English Literature*

As mentioned in Chapter 4, Mr. Ming did not work in term time because he believed that working would occupy his study time and therefore influence his academic performance. Yet his off-term working experience improved his time management skills and made him realized that he might be able to balance work and study in college with better time management skills.

This possibility is verified by the experiences of some interviewees who worked in term time. For instance, Ms. Meng from the "985" institution who worked as an intern in the third year said:

"I was working during the finals, but I performed as well as before when I focused only on studying. I think this is because I have better time-management skills now."

—Ms. Meng from the "985" institution, majoring in English Literature

The better time-management skills come from the pressure of doing multitasks at the same time. Mr. Hou who took an intensive internship during term time while preparing for a professional exam talked about how he struggled through that semester:

"I worked under a very tight schedule. It felt like I was draining myself out. I had to work very efficiently, to be able to multitask and manage my time better."

—Mr. Hou from the "985" institution, majoring in Industrial Engineering

Like Mr. Hou, many interviewees mentioned that they were forced to become more efficient during the period when they were working, as they had long to-do lists both in school and at work. This helped them to make the most of their time. As Ms. Wang from the non-key institution pointed out:

"You can always find some time to do what you want to do. The more tasks you have, the more efficient you will be."

—Ms. Wang from the non-key institution, majoring in Material Engineering

She did several private tutoring jobs since the sophomore year. At the mean time, she was a student leader in school, and attended a driving school to get her driver's license. She never felt that working and other activities hindered her academic performance, as she was very productive when studying.

The above analysis shows that students may be forced to use their time more efficiently in order to balance school and work. Yet whether students' productivity would become improved is determined by their motivation to a large extent. Those who do not care about academic performance may have little incentive to get a balance between school and work. Mr. Xiao from the “985” institution and Mr. Liang from the non-key institution are two examples of such students. They took many part-time jobs in the first two years in college partly because they found the course work to be boring. So they did not care about their worsened academic performance. Mr. Liang talked about his motivation in his sophomore year:

> *“I did not think it was necessary to keep a good academic record in college. I ranked the first in my program in the first year, but dropped to lower middle in the second year. But I did not care. My ability (to study well) had been demonstrated and I thought that was good enough. I did not need to get the first place every year. That was what in my mind at that time.”*
>
> *—Mr. Liang from the non-key institution, majoring in Electronic and Information Engineering*

By contrast, Mr. Hou who decided to apply to jobs in an industry other than his major paid a lot attention to his academic performance while taking the internships. He said:

> *“I cannot afford a bad academic record, as the employers also value good academic performance. …… I had to push myself to work very hard.”*
>
> *—Mr. Hou from the “985” institution, majoring in Industrial Engineering*

This was the reason why Mr. Hou worked at his full effort in the semester when he was taking the internship for the consulting company. Though Mr. Hou’s course scores in that semester were decreased a little, his overall academic performance in college was very good and ranked 9/63 in his program. The comparison between these students suggests that student motivation and attitude towards studying may be important for the impact of term-time working on academic performance. More motivated students may be more determined in balancing their work and study and therefore be less vulnerable to the negative influence of term-time working.

5.2.2 Path Two: attitude and commitment towards studying.

The above analysis shows that student's motivation influences the impact of term-time working on their academic performance. Yet, term-time working may also influence students' attitude towards studying. For instance, an interviewee from the non-key institution who worked for a private tutoring center for one year said:

> *"I am not a hard working student. I rarely studied after class as long as I could pass the course. But when I was working, I felt very upset. I was afraid that other students were studying while I was working, and I would be left behind if I did not study. So I took my textbooks to work and read during the breaks. …… I felt that my academic performance got better in that year. Before I worked, I was very upset before exams; but as I was studying during work, I felt not as nervous as before."*
>
> *—Ms. Ran from the non-key institution, majoring in International Economics*

Ms. Ran's attitude towards studying was changed by the worry of being left behind in school. Some other interviewees became more committed to studying with the concern of their future. For instance, Mr. Liang who did not value academic performance in the second year of college talked about the change that part-time jobs brought him:

"The primary influence is that, working makes me realize that it is hard to make money (through labor-intensive jobs). You need to study harder; otherwise, you will suffer when you enter the society."

—Mr. Liang from the non-key institution, majoring in Electronic and Information Engineering

Mr. Liang realized that he needed valid skills and knowledge to find a good job. Therefore he spent his third and fourth year working as a research assistant for a lab in his major field. The knowledge and skills learnt from the research assistant job helped him to perform well in exams, though he did not attend classes regularly. Finally he was recommended to the graduate school of the non-key institution without taking the entrance exam. Similar to Mr. Liang, Ms. Xiang from the non-key institution also became more committed to studying after working in a factory as a manual worker. She said that she did not want to work in labor-intensive jobs any more and therefore studied harder in school. She finally got admitted to a graduate school in a big city. These students were motivated by the reality of life they learnt through part-time jobs outside the campus. Working increased their commitment to studying and therefore increased their educational achievement.

In summary, the qualitative analysis with interview data reveals two paths through which term-time working may influence students' academic performance. The first path is time allocation and management. Working during term time occupies students' time and energy. Therefore it would negatively influence students' academic performance if it takes away their study time. This is consistent with the prediction of the student involvement theory (Astin, 1984). Yet term-time working may force students to be more efficient and productive and improve their time management skills, which in turn helps them to balance study and work. Students' motivation and attitude towards studying is important here, as it determines whether they would be willing to work and study hard. This implies the second path through which term-time working may influence students' academic achievement. With more social experience gained during working, some students get a clearer plan of their future and become more committed to studying in order to realize the plan. In this way, term-time working changes students' attitudes towards studying and influences their educational achievement. In the same logic, however, it is also possible that working makes students more committed to their role as an employee rather than a student, as suggested by Fjortoft (1995). Then it would have a negative influence on students' academic performance and educational achievement. But there is no direct evidence on this possibility in the interview sample. Overall, the above analysis shows that working may decrease students' academic performance by occupying their time and energy. But such a negative impact can be alleviated by high motivations and improved time management skills. This suggests that the quantitative estimates of the impact of term-time working on academic performance might be upward biased if failing to control for students' motivation and skills.

5.3 Summary of empirical findings

Working in academic semesters has become a prevalent activity among Chinese undergraduate students. As shown in Chapter 4, about 63% of students worked at some point during term time. Astin's (1984) student involvement theory suggests that, working during term time occupies students' time and energy that could be otherwise spent on studying, and therefore may have a negative impact on students' academic achievement. However, no prior studies in China have examined the impact of term-time working on students' academic performance with rigorous research design. This chapter presents an in-depth investigation of the relationship between term-time working and academic performance. The quantitative analysis estimates the impact of term-time working on academic performance with OLS, PSM, and IV strategies. The qualitative analysis explores potential explanations to the impact of term-time working based on students' experiences. Overall, the quantitative analysis reveals that term-time working has a negative impact on students' academic performance. The qualitative analysis shows that such a negative impact is mediated mainly by reduced time and energy for studying. This is consistent with the prediction of the student involvement theory by Astin (1984). The qualitative analysis also suggests that the negative impact of term-time working on academic performance could be mitigated by improved time management skills and high self-motivation.

In the quantitative analysis, the three strategies, i.e. OLS, PSM, and IV, consistently find statistically significant and negative associations between the participation in term-time working and students' academic performance, though the effect size of the IV estimates is much larger than that for the OLS and PSM estimates. The OLS and IV estimations further reveal that the negative impact is mainly exerted through the intensity of term-time working as measured by average hours worked per week during term time. The qualitative analysis provides supportive evidence to this finding. Most of the interviewees related their perceived influence of term-time working on academic performance to time allocation and management. Those who perceived negative influence all attributed it to the reduced time on studying. Those who perceived insignificant influence either used their leisure time to work, or reported improved efficiency and productivity under the pressure to balance school and work.

In addition, the quantitative analysis shows that the impact of term-time working on academic performance varies across forms of jobs. Taking part-time jobs and internships is statistically significantly associated with worse academic performance, while taking work-study jobs in term time does not significantly influence students' academic performance. The qualitative analysis also provides some evidence of the impacts of different forms of jobs. With regards to the impact of term-time internships, the qualitative findings support the quantitative findings. As discussed in Chapter 4, the internships are in general more demanding than work-study jobs and part-time jobs, and usually require attendance of several full working days per week during term time. Interviewees who took internships in term time pointed out that such jobs not only occupied their study time, but also consumed their energy. Therefore even highly motivated students, for instance, Mr. Hou from the "985" institution, experienced worsened academic performance when taking internships in term time.

As for the impact of part-time jobs, the qualitative findings are a little different from the quantitative ones. The IV estimates of the impact of term-time part-time jobs are statistically significant and even larger in magnitude than the estimated impact of term-time internship. But in the qualitative analysis, the majority of interviewees who took part-time jobs in term time did not perceive negative influence on academic performance as they just worked moderately during spare time. Those who perceived negative influence either took relatively demanding jobs such as on-campus sales representatives, or did not care about academic performance. This evidence suggests that intensive part-time jobs may have negative influence on students' academic performance. However, it is still not able to explain why the IV estimates of the impact of part-time jobs is larger in absolute value than the estimated impact of internships, as the average hours worked per week in part-time jobs is much smaller than the average hours spent on internships in the quantitative sample.

As for the impact of work-study jobs, the qualitative findings in this study may not be conclusive, as there are only four interviewees who ever took work-study jobs in term time, and all of them are from the "985" institution. Nevertheless, the qualitative finding is basically consistent with the quantitative finding, as three out of the four interviewees did not perceive negative influence on academic performance.

For another thing, the quantitative subsample analysis by elite and non-elite institution suggests that the impact of term-time working on academic performance might be influenced by students' motivation. The qualitative analysis provides some supportive evidence to this finding as it finds that students with higher motivation are more willing to work hard in order to balance work and study. But in the qualitative sample, interviewees from the non-key institution did not report more negative impact than interviewees from the "985" institution. This may because students' perception of the impact is also influenced by their motivation. Interviewees from the "985" institution in general placed more emphasis on academic performance than those from the non-key institution, and therefore they might be more likely to perceive a negative impact of term-time working on academic performance.

Overall, the empirical analysis presented in this chapter reveals that term-time working may negatively influence students' academic performance in college. It takes away the time and energy that could be otherwise spent on studying. But students also learn time management skills from working. Therefore moderate working may not be detrimental, as the improved efficiency and productivity can help students to balance school and work. The qualitative analysis also suggests a second potential path through which term-time working may influence students' educational achievement. Students may be able to learn more about the society through working and form a clear plan about their future. Some of them may therefore become more committed to studying and pursuit for better educational achievement. In addition, the qualitative analysis shows that many students actively adjust their term-time working behavior according to their school schedule and academic performance. This suggests that students' term-time working decision and academic performance may be intertwined and influence each other. Such an influence could be simultaneous, as students might be able to quit their term-time job or drop courses in the middle of an academic semester when they perceive negative influence of working on academic performance. It may also be a sequential influence, if students make term-time working decisions based on their previous academic performance and/or on their anticipation about the class load in the upcoming semester. The qualitative data provide evidence on both possibilities. But the hypotheses cannot be test with the CSLM2011 data. Future studies with longitudinal data that tracks students through college may provide some insights on this issue.

Chapter 6 The impact of term-time working on early post-graduation labor market outcomes

Post-college labor market performance is one of the most important outcomes of higher education. As suggested by the human capital theory, individuals' labor market performance is influenced by their educational attainment and working experience. Presumably, working experience gained during school year may also influence individual's labor market performance. As revealed by previous U.S. empirical studies, it has a positive impact on post-college earnings (Gleason, 1993; Hotz et al., 1999; Light, 2001; Molitor & Leigh, 2005; Stern & Nakata, 1991; Titus, 2010). Previous Chinese studies also find some evidence of the positive impact of in-college working, though most of the studies focused on internships (Du & Yue, 2010; He & Zhang, 2006; Xie & Li, 2010; Yue et al., 2004; S. Zhu, 2010). None of the Chinese studies has explicitly examined the impact of working experience gained during academic semesters. This chapter presents empirical findings on this topic and addresses Research Question 2.2 (Does term-time working have an impact on students' early post-college labor market performance?), Research Question 2.4 (Does the impact on early post-college labor market performance vary by the forms of job taken by students?), and Research Question 3.3 (What gains and losses from term-time working and labor market performances?) listed in Chapter 3. Section 6.1 presents the quantitative analysis; Section 6.2 presents the qualitative analysis; and Section 6.3 summarizes and integrates quantitative and qualitative findings.

6.1 Quantitative analysis on labor market outcomes

The labor-market outcomes examined in this analysis are initial employment status as measured by whether the student was being offered a job before graduation, and starting salary as measured by monthly wage provided by the best offer. These are early post-college outcomes. The basic comparisons presented in Section 4.2 show that term-time working students are more likely to be offered a job before graduation than those who never work in term time, but on average have a lower starting salary. Yet these comparisons do not control for covariates and cannot reveal the real impact of term-time working on labor market outcomes. This section estimates the impact with econometric models and quasi-experimental strategies. Section 6.1.1 describes the sample used in this chapter. Section 6.1.2 presents the results from basic models. Section 6.1.3 presents the estimates with quasi-experimental strategies. Section 6.1.4 shows the impact of different forms of term-time working on labor market outcomes. Section 6.1.5 presents a robustness check with regards to the sample selection bias problem in the wage model. Section 6.1.6 summarizes the quantitative findings.

6.1.1 The "Intention-to-Work" sample

The analysis on the impact on post-college labor market outcomes uses a subsample of students who have an intention to work after graduation (hereafter referred to as the "Intention-to-Work" sample). In the whole sample, about 21% of the graduating students applied to graduate school, and about 5% planned to study abroad. These students may not have a job offer because they do not have the intention to work. Therefore they cannot be counted as unemployed, and are excluded from the "Intention-to-Work" sample. In addition, 7% of the whole sample did not have a clear plan by the time of the survey. These students are included in the “Intention-to-Work” sample if they took actions to look for a job. The final “Intention-to-Work” sample contains 4,984 students.

Table 6.1 presents the descriptive statistics of students in the “Intention-to-Work” sample. The means of the whole sample are presented in the first column for comparison. As the table shows, students in the “Intention-to-Work” sample are different from the whole sample in several ways. First, there are fewer females and fewer “single-child” students in the “Intention-to-Work” sample. Second, the percentage of students from rural area is higher in the “Intention-to-Work” sample than in the whole sample, and the average family income and SES score are lower in the “Intention-to-Work” sample. This indicates that students in the “Intention-to-Work” sample are from less advantaged social background. Third, the percentage of students attending first-tier institutions, especially the “985” institutions, is lower in the “Intention-to-Work” sample. In addition, students in the “Intention-to-Work” sample have lower NCEE score and lower average course score in college than the whole sample. Also, more students in the “Intention-to-Work” sample fail to pass the CET-4 test, and fewer students have passed the CET-6 test. There are also fewer CCP members, students leaders, and merit-based financial aid winners in the “Intention-to-Work” sample than in the whole sample. These differences indicate that students in the “Intention-to-Work” sample perform worse academically and have lower ability than those who are not in the sample. This is reasonable as those excluded from the “Intention-to-Work” sample are students who intend to go to graduate schools after college and presumably have better academic performance. Overall, the above differences suggest that findings from the "Intention-to-Work" sample may not be generalizable to those who are not in the sample.

With regards to term-time working experience, there are more working students in the "Intention-to-Work" sample. 64.9% of students in this sample ever work during term time and 31.8% ever work during vacations. The percentages are 62.7% and 28.9% in the whole sample. Among term-time working students, the average length of working is about 5.65 months, which is similar to average length of the whole sample. Yet the means for the average hours worked per week and accumulated full-time equivalent days are larger in this sample than in the whole sample. Term-time working students in this sample on average spend about 24 hours per week on working and accumulate about 64.6 days of working experiences, while the statistics are 22.7 hours per week and 61.8 days for the whole sample. These basic comparisons suggest that students in the "Intention-to-Work" sample are more likely to work and work more intensively than those who are not in the sample. Yet it is hard to distinguish with available evidence whether students who plan to work after graduation intentionally work more in college, or the participation in working during college increases the tendency to work after graduation.

Among students in the "Intention-to-Work" sample, about two-third are offered at least one job by the time of the survey. The average starting wage of their best offer is 2,377 RMB. This is lower than the national statistic reported in the *2012 Report of College Graduates Labor Market Placement* by MyCOS Institute, which is 3,051 RMB for four-year college graduates in 2011. There are two major reasons for this difference. First, the MyCOS's average monthly wage statistic is calculated after 6 months of graduation, while the statistic in this study is calculated with the wage offered before graduation. As the first three months of a new job is the probation period, during which the monthly wage is usually lower, it is reasonable that the statistic in this sample is lower than that of the MyCOS's data. Second, MyCOS's measurement of wage includes both basic salary and pecuniary benefits, while the wage in this data only includes basic salary. Pecuniary benefits such as performance bonus and subsidies account for a significant part of individual's salary, and most employers start to provide benefits after the probation period. Therefore the wage reported in the survey may not reflect the real earnings a student can get from the job. Yet it still reflects the "quality" of the job as long as the measurement is consistent across individuals, and the sector, industry, and location of the job are being controlled for.

With regards to the sector of job, about 38% of students who are in the "Intention-to-Work" sample and are offered a job by the time of survey are employed in the public sector, with about 1.3% by governments and social organizations, about 7.5% by public institutes, and about 29.2% by state- or public-owned firms. 53.6% of students are employed in the private sector, with about 11.4% by foreign- or co-owned companies and 42.28% by private-owned companies. Another 1.2% of students start their own business after graduation. With regards to the industry of the job, the most popular industry is manufactory (24.8%), followed by computer service and software industry (14.7%), finance and business related industries (13.7%), and education (8.1%). This is in general consistent with the distribution of academic majors in this sample. About 55% of students in the "Intention-to-Work" sample are majored in Science and Engineering, about 17.8% in Economics and Management, and about 29.7% are from normal universities. With regards to the location of workplace, about 38% of students who are offered a job receive their best offer in a province other than where their institution locates. Most of the jobs are in the east area, northeast area, and the municipalities. Only about 28.6% of the jobs are located in the central and west areas.

For another thing, some students who are not in the “Intention-to-Work” sample also got job offers. These students planned to go to graduate school, but applied to jobs as a back-up option. This group of students accounts for about 15.2% of those who are not in the “Intention-to-Work” sample. The average monthly wage offered to these students is 2,461 RMB, which is higher than the wages for students in the “Intention-to-Work” sample. This explains why the average monthly wage is higher in the whole sample than that in the “Intention-to-Work” sample. As described previously, students in the “Intention-to-Work” sample have lower ability and academic achievement than those who are excluded. These differences may explain the difference in their starting wage.

Table 6.1 Descriptive Statistics of Variables in the "Intention-to-work" Sample (Weighted) (Sample size=4,984)

Variable	Variable name	Mean or % of the whole sample (6,977 obs)	Mean/percentage	Std. Dev.
Panel 1. Individual and family characteristics				
Age	age	22.99	23.02	0.99
Gender (female=1) (%)	female	47.27	45.74	
Race (minority=1) (%)	minority	5.25	5.39	
Single child (Yes=1) (%)	singlechild	36.38	34.11	
Region of residency before college (%)	resregion		(%)	
Municipality		8.40	9.08	
East		29.17	29.97	
Northeast		13.06	13.01	
Central		25.81	24.15	
West		20.17	21.06	
Rural (Yes=1) (%)	rural	43.15	46.45	
Annual household income (in RMB)	housinc	46964.20	45662.63	41338.09
SEI score (constructed)	SEI	-0.15	-0.24	0.94

NCEE score (rescaled to 1~100)	ncee100	70.41	69.82	7.72
High school academi track (%)	track			
Humanity		24.87	24.22	
Science		67.98	68.50	
Arts and athlete		5.78	6.18	
Ever worked in high school (Yes=1) (%)	hswork	3.05	3.29	
Student leader in high school (Yes=1) (%)	seniorleader	41.62	39.84	
Panel2. College experience				
Average score in college	avescore	79.64	78.62	6.55
Major (%)	major			
Liberal Arts		13.83	13.10	
Social sciences		8.25	7.95	
Sciences & engineering		54.43	55.02	
Econ & Management		16.88	17.75	
Others		6.27	6.07	
Preference degree of one's major (%)	likemajor			
Not at all		7.97	8.62	
A little bit		28.38	29.60	
Somewhat		47.41	47.43	
Very much		12.31	11.30	
Whether has a minor (%)	hasminor	7.03	6.30	
English (%)	English			
Not passed CET4		20.24	23.26	
Passed CET4		42.48	44.72	
Passed CET6		33.37	28.53	
Hours spent per week on studying after class	reviewtime	13.42	12.74	8.73
Leader in student organizations (Yes=1) (%)	stleader	21.78	20.51	
CCP member (Yes=1) (%)	Partymember	29.54	26.81	
Professional certificate (Yes=1) (%)	certificate	45.65	45.12	
Tuition (stiker price, in RMB)	tuition	5629.19	5597.08	3081.11
Family fund (in RMB)	familyfund	9412.62	9313.60	5619.73
Total financial aid (in RMB)	finaid	2266.73	2147.38	2432.17
Had merit aid (Yes=1) (%)	hadmeritaid	34.13	30.81	
Had need aid (Yes=1) (%)	hadneedaid	21.09	21.04	
Had loan (Yes=1) (%)	hadloan	27.92	28.58	
Panel 3. Term-time working experience				
Ever worked in college (Yes=1) (%)	worked	78.12	80.90	
Ever worked during term time (Yes=1) (%)	termtime	62.74	64.85	
Ever worked during vacations (Yes=1) (%)	offterm	28.94	31.78	
Total months worked during term time	ttdr	5.67	5.65	6.05
Average hours worked per week in term time	tthr	22.71	23.91	15.78
Total days worked in term time (constructed)	ttday	61.77	64.60	80.21
Form of term-time working experience (% of term-time working students)	ttnum			
Work-study only		11.55	10.69	

Part-time only		22.99	22.70	
Internship only		27.49	28.90	
Work-study and Part-time		6.54	5.58	
Work-study and internship		4.73	5.05	
Part-time and internship		17.31	17.86	
All three forms		9.02	8.83	
Types of the most recent term-time working (% of students whose most recent in-college woring experience was during term time)	ttjobtype			
labor-intensive jobs		7.58	7.95	
service-type jobs		9.31	9.42	
sales		12.28	12.70	
private tutoring		7.64	6.77	
education & training		11.10	9.93	
office staff		18.43	20.42	
professional job		16.26	17.67	
Panel 4. Institution level characteristics				
Ranking level of institution (%)	instlevel			
985 institution		6.65	5.15	0.22
211 but not 985 institution		12.28	10.82	0.31
non-key institution		69.72	72.79	
Independent college		11.44	11.24	
Concentration of institution (%)	instcon			
Comprehensive institution		22.18	21.16	
Engineering-concentrated institution		43.34	44.10	
Others concentration		34.48	34.74	
Region of institution (%)	instregion			
Municipality		14.48	13.28	
East		25.16	26.59	
Northeast		15.53	15.05	
Central		25.09	24.22	
West		19.73	20.87	
Location of campus (%)	instloc			
Urban		18.61	19.04	
Urban & suburban		3.89	3.08	
Suburban		32.50	32.73	
Small-scale city		44.99	45.14	
% of low-SES students in the original sample	lowSESp	0.26	0.27	0.12
% of working students in the original sample	workp	0.75	0.75	0.12
% of students worked during termtime in the original sample	ttp	0.59	0.59	0.15
Panel 5. Labor market outcomes				
Had an offer by graduation (%)	haveoffer	53.20	66.19	0.47
Wage per month (in RMB)	wage	2381.99	2376.94	1207.63
Type of employer (%)	emptype			
Government or social organization		1.71	1.34	

Public institute		7.53	7.52	
State and public owned firms		28.95	29.15	
Foreign or co-owned firms		11.01	11.35	
Private owned firms		41.81	42.28	
Self owned business		1.36	1.20	
Industry (%)	industry			
Agriculture/Fishing/Forestry		2.30	2.19	
Mining/Manufactory/Construction		24.55	24.76	
Utilities/Energy		5.53	5.37	
Transportation/Storage/Postal		3.98	4.04	
Telecom/Computer service and software		14.61	14.71	
Wholesale/Retail		3.72	3.70	
Hospitality/Food services		2.44	2.22	
Finance		6.66	6.86	
Real Estate		3.68	3.87	
Lease & business service		1.94	2.00	
Education		7.87	8.10	
Medical care		2.70	2.73	
Culture/Sport/Social utility		4.38	4.37	
Science & research/technology service		5.15	5.20	
Water conservancy/Environmental Protect		1.20	1.13	
Community service and other services		1.47	1.42	
Government/NGO/internatinal organizatio		1.32	1.19	
Others		1.44	1.48	
Region of work place (%)	workregion			
Municipality		14.72	14.66	
East		37.21	37.54	
Northeast		6.76	7.11	
Central		13.00	13.23	
West		14.93	15.37	
Migrant for work (% of those who have offer)	migwork	37.15	37.99	

6.1.2 The basic models

This section presents the basic model estimates on the impact of term-time working on the initial employment status and starting salary. The models are estimated with Probit and OLS regressions. These estimates serve as the baseline results for comparison in further analysis. This section also summaries evidence on the impact of other covariates on labor market outcomes.

6.1.2.1 Impact on the initial employment status

The model used to estimate the impact of term-time working on initial employment status is expressed in Equation 3.3:

$$Emp_i = \beta_0 + \beta_1 W_i + \beta_2 S_i + \beta_3 X_i + \theta_i \text{ .... } (3.3)$$

where the dependent variable, Emp_i, is a binary variable indicating whether the student has at least one job offer just before graduation. W_i is a measure of term-time working experience, S_i is schooling attainment measured by average course score, whether had merit-aid, and whether obtained CET certificates, and X_i is a set of covariates as specified in Section 3.3.2.1. The model is estimated with probit regression. The results are presented in Table 6.2.

Table 6.2 presents the probit estimates of the impact of participation in term-time working. Both the term-time working and off-term working experience may contribute to students' post-college labor market performance. Therefore the model presented in Column (1) of Table 6.2 estimates the impact of overall in-college working participation. Column (2) presents the estimates of the impact of term-time working participation by itself. Column (3) adds off-term working participation as a covariate. The marginal effects are shown for easy interpretation.

As shown in the table, term-time working participation has a positive association with the probability of being offered a job before graduation. Column 1 shows that working at some point during college is statistically significantly associated with an increase of 11.1 percentage points in the probability of being offered a job. In Columns 2 and 3, both term-time working and off-term working are statistically significantly associated with higher probability of being employed. When off-term working participation is controlled for, the participation in term-time working is associated with a 7.6 percentage points increase in the probability of being employed before graduation. The association between off-term working participation and the probability of being employed is larger and more statistically significant, the magnitude of which is 12 percentage points. These results indicate that working experience gained in vacations may be more valuable than that gained in term time. This may be because many off-term jobs are formal jobs such as fulltime internships, which provide students with working experience of better quality than the experience of taking temporary jobs in term time. Out of this reason, off-term working participation is controlled for in all models in the rest of this analysis.

Table 6.2 Probit estimates of the impact of term-time working on initial employment status
(Dependent variable: whether being offered a job before graduation)

	(1) In-college working	(2) Term-time working	(3) Term-time & off-term working
Ever worked in college	0.111***		
	(0.0318)		
Ever worked in term-time		0.0841**	0.0755**
		(0.0280)	(0.0281)
Ever worked in vacations			0.120***
			(0.0241)
Age	0.000644	-0.000423	-0.000838
	(0.0122)	(0.0129)	(0.0126)
Female	-0.0424	-0.0573*	-0.0562*
	(0.0272)	(0.0284)	(0.0283)
Minority	-0.0436	-0.0334	-0.0457
	(0.0451)	(0.0465)	(0.0466)
Single child	-0.0529+	-0.0579+	-0.0472
	(0.0288)	(0.0305)	(0.0301)
From rural area	0.00969	0.00171	0.00499
	(0.0321)	(0.0338)	(0.0329)
SES score	-0.0130	-0.00386	-0.00479
	(0.0173)	(0.0180)	(0.0178)
Student leader in senior high school	0.0522*	0.0596*	0.0581*
	(0.0235)	(0.0246)	(0.0245)

Humanity track in high school	0.0103	-0.0170	-0.0117
	(0.0381)	(0.0405)	(0.0400)
Arts or athlete student in high school	0.0116	-0.0249	-0.0233
	(0.0540)	(0.0589)	(0.0588)
NCEE score (rescaled to 1~100)	0.00361+	0.00342+	0.00309
	(0.00185)	(0.00194)	(0.00195)
Average course score	-0.00486*	-0.00490*	-0.00472*
	(0.00216)	(0.00225)	(0.00225)
Science or Engineering major	0.0946*	0.0797+	0.0943*
	(0.0398)	(0.0421)	(0.0417)
Economics or Management major	0.0148	0.0254	0.0183
	(0.0372)	(0.0386)	(0.0389)
Have a minor	0.0387	0.0342	0.0322
	(0.0431)	(0.0447)	(0.0457)
Preference degree of one's major	0.0395**	0.0480**	0.0501**
	(0.0150)	(0.0159)	(0.0157)
Pass CET-6	0.0434	0.0502	0.0604+
	(0.0359)	(0.0369)	(0.0364)
Pass CET-4	0.0449	0.0501	0.0561+
	(0.0310)	(0.0319)	(0.0317)
Student leader	-0.00918	-0.00991	-0.0169
	(0.0300)	(0.0317)	(0.0314)
CCP member	0.0429	0.0438	0.0478+
	(0.0275)	(0.0286)	(0.0282)
Have professional certificates	0.0303	0.0390	0.0415+
	(0.0232)	(0.0242)	(0.0240)
Have merit-based aid	0.0163	0.0146	0.00634
	(0.0285)	(0.0297)	(0.0295)
Have need-based aid	0.0452	0.0637*	0.0640*
	(0.0310)	(0.0319)	(0.0312)
Have loan	0.0566*	0.0654*	0.0638*
	(0.0284)	(0.0299)	(0.0295)
No. of job applications	0.00156**	0.00169**	0.00168**
	(0.000559)	(0.000576)	(0.000569)
% of low-SES students in the institution	0.242	0.306+	0.315*
	(0.154)	(0.159)	(0.158)
Comprehensive institutions	0.00225	-0.00466	-0.00395
	(0.0318)	(0.0336)	(0.0338)
Engineering-concentrated institutions	0.141***	0.126***	0.132***
	(0.0302)	(0.0316)	(0.0317)
"985" institution	0.0815*	0.0833*	0.0905**
	(0.0324)	(0.0345)	(0.0343)
"211" institution	-0.0263	-0.0393	-0.0321
	(0.0242)	(0.0256)	(0.0257)
Independent college	-0.115*	-0.110+	-0.109+
	(0.0541)	(0.0576)	(0.0583)

Institution located in central or west area	-0.0332	-0.0331	-0.0380
	(0.0311)	(0.0323)	(0.0319)
Institution locates in small city	-0.0982**	-0.129***	-0.125***
	(0.0299)	(0.0311)	(0.0313)
N	4,917	4,496	4,496
Psuedo R_sq	0.194	0.206	0.218

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Marginal effects instead of coefficients are reported.
3. Missing dummies are included.
4. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Table 6.3 Probit estimates of the impact of term-time working on initial employment status (Dependent variable: whether being offered a job before graduation)

	(1)	(2)	(3)	(4)	(5)	(6)
	Length	**Length _sq**	**Intensity**	**Intensity _sq**	**Total amount**	**Total amount _sq**
Total months worked during term time	0.0103***	0.0126*				
	(0.00267)	(0.00579)				
sample mean	5.65					
coef*sample mean	0.0582					
Square of total month		-0.000103				
		(0.000250)				
Average hours worked per week during term time			0.00232**	0.00472+		
			(0.000748)	(0.00264)		
sample mean			23.91			
coef*sample mean			0.06			
Square of average hour				-5.24E-05		
				(5.55E-05)		
Accumulated full-time equivalent working days during term time					0.000631**	0.00153***
					(0.000228)	(0.000351)
Square of total day						-2.31E-06**
						(7.22E-07)
sample mean						64.60
coef*sample mean						0.10
Ever worked in vacations	0.116***	0.116***	0.101***	0.101***	0.105***	0.103***
	(0.0244)	(0.0244)	(0.0249)	(0.0250)	(0.0251)	(0.0251)
Age	-0.000936	-0.000836	-0.00794	-0.00814	-0.00580	-0.00574
	(0.0127)	(0.0127)	(0.0128)	(0.0128)	(0.0129)	(0.0129)
Female	-0.0500+	-0.0502+	-0.0678*	-0.0698*	-0.0576*	-0.0597*
	(0.0286)	(0.0286)	(0.0286)	(0.0287)	(0.0289)	(0.0290)
Minority	-0.0544	-0.0540	-0.0623	-0.0616	-0.0733	-0.0716
	(0.0471)	(0.0471)	(0.0489)	(0.0490)	(0.0492)	(0.0498)
Single child	-0.0610*	-0.0611*	-0.0647*	-0.0639*	-0.0703*	-0.0699*

	(0.0305)	(0.0305)	(0.0313)	(0.0314)	(0.0316)	(0.0319)
From rural area	-0.00136	-0.00187	-0.00633	-0.00698	-0.00460	-0.00902
	(0.0336)	(0.0337)	(0.0342)	(0.0342)	(0.0348)	(0.0349)
SES score	0.00336	0.00359	0.000302	0.000598	0.00471	0.00552
	(0.0180)	(0.0179)	(0.0186)	(0.0186)	(0.0188)	(0.0187)
Student leader in senior high school	0.0647**	0.0645**	0.0411	0.0408	0.0451+	0.0445+
	(0.0246)	(0.0247)	(0.0255)	(0.0256)	(0.0256)	(0.0256)
Humanity track in high school	-0.000398	-0.000992	0.00116	0.00281	0.00687	0.00337
	(0.0399)	(0.0399)	(0.0408)	(0.0408)	(0.0410)	(0.0409)
Arts or athlete student in high school	-0.00903	-0.00839	-0.00914	-0.00666	-0.00960	-0.0143
	(0.0596)	(0.0595)	(0.0619)	(0.0617)	(0.0630)	(0.0636)
NCEE score (rescaled to 1~100)	0.00267	0.00271	0.00350+	0.00356+	0.00310	0.00322
	(0.00197)	(0.00197)	(0.00206)	(0.00207)	(0.00208)	(0.00209)
Average course score	-0.00517*	-0.00515*	-0.00567*	-0.00564*	-0.00585*	-0.00580*
	(0.00230)	(0.00230)	(0.00230)	(0.00231)	(0.00235)	(0.00236)
Science or Engineering major	0.0996*	0.101*	0.0993*	0.101*	0.0992*	0.100*
	(0.0416)	(0.0414)	(0.0429)	(0.0431)	(0.0434)	(0.0430)
Economics or Management major	0.0121	0.0131	0.0430	0.0440	0.0383	0.0375
	(0.0394)	(0.0394)	(0.0377)	(0.0378)	(0.0384)	(0.0384)
Have a minor	0.0370	0.0360	0.0128	0.0133	0.0306	0.0248
	(0.0459)	(0.0458)	(0.0479)	(0.0479)	(0.0468)	(0.0472)
Preference degree of one's major	0.0572***	0.0573***	0.0549***	0.0549***	0.0587***	0.0604***
	(0.0159)	(0.0159)	(0.0162)	(0.0163)	(0.0162)	(0.0163)
Pass CET-6	0.0733*	0.0732*	0.0757*	0.0765*	0.0842*	0.0850*
	(0.0364)	(0.0364)	(0.0361)	(0.0361)	(0.0363)	(0.0363)
Pass CET-4	0.0481	0.0488	0.0649*	0.0662*	0.0608+	0.0594+
	(0.0319)	(0.0318)	(0.0325)	(0.0325)	(0.0327)	(0.0328)
Student leader	-0.0193	-0.0196	0.00609	0.00504	-0.00485	-0.00790
	(0.0315)	(0.0315)	(0.0317)	(0.0318)	(0.0319)	(0.0319)
CCP member	0.0434	0.0434	0.0325	0.0336	0.0313	0.0335
	(0.0286)	(0.0286)	(0.0296)	(0.0296)	(0.0299)	(0.0298)
Have professional certificates	0.0503*	0.0504*	0.0463+	0.0460+	0.0468+	0.0464+
	(0.0242)	(0.0242)	(0.0247)	(0.0247)	(0.0249)	(0.0249)
Have merit-based aid	0.0113	0.0105	0.00561	0.00340	0.00702	0.00401
	(0.0297)	(0.0297)	(0.0308)	(0.0309)	(0.0311)	(0.0312)
Have need-based aid	0.0463	0.0464	0.0789*	0.0785*	0.0659*	0.0604+
	(0.0318)	(0.0318)	(0.0321)	(0.0322)	(0.0325)	(0.0327)
Have loan	0.0675*	0.0667*	0.0847**	0.0829**	0.0871**	0.0848**
	(0.0295)	(0.0295)	(0.0299)	(0.0301)	(0.0302)	(0.0302)
No. of job applications	0.00170**	0.00170**	0.00143*	0.00141*	0.00163**	0.00160**
	(0.000575)	(0.000575)	(0.000584)	(0.000584)	(0.000594)	(0.000591)
% of low-SES students in the institution	0.300+	0.298+	0.337*	0.327*	0.319+	0.307+
	(0.160)	(0.161)	(0.165)	(0.164)	(0.166)	(0.166)
Comprehensive institutions	-0.0106	-0.00941	-0.0276	-0.0265	-0.0229	-0.0133
	(0.0343)	(0.0343)	(0.0357)	(0.0357)	(0.0358)	(0.0356)
Engineering-	0.146***	0.147***	0.117***	0.119***	0.134***	0.146***

concentrated institutions	(0.0322)	(0.0323)	(0.0330)	(0.0330)	(0.0333)	(0.0333)
"985" institution	0.0987**	0.0987**	0.0846*	0.0845*	0.0902*	0.0935**
	(0.0343)	(0.0343)	(0.0364)	(0.0363)	(0.0363)	(0.0359)
"211" institution	-0.0326	-0.0327	-0.0375	-0.0379	-0.0336	-0.0350
	(0.0264)	(0.0264)	(0.0271)	(0.0271)	(0.0273)	(0.0275)
Independent college	-0.114+	-0.113+	-0.100+	-0.0984	-0.0984	-0.0868
	(0.0591)	(0.0592)	(0.0596)	(0.0599)	(0.0601)	(0.0599)
Institution located in central or west area	-0.0412	-0.0412	-0.0555+	-0.0532	-0.0542	-0.0540
	(0.0327)	(0.0327)	(0.0333)	(0.0333)	(0.0337)	(0.0338)
Institution locates in small city	-0.120***	-0.120***	-0.126***	-0.125***	-0.121***	-0.121***
	(0.0319)	(0.0319)	(0.0324)	(0.0324)	(0.0328)	(0.0328)
N	4,333	4,333	4,108	4,108	4,028	4,028
Psuedo R_sq	0.230	0.230	0.223	0.223	0.230	0.234

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Marginal effects instead of coefficients are reported.
3. Missing dummies are included.
4. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Table 6.3 presents the estimates of the impact of length, intensity, and total amount of term-time working, controlling for off-term working participation and other covariates. Quadratic forms of the three measures are also added to the models. As shown in the table, the length, intensity, and total amount of term-time working all have statistically significant and positive associations with the probability of being offered a job before graduation. The quadratic forms of length and intensity are not statistically significant (Columns 2 and 4). But the quadratic form of total amount is statistically significant and negative, though the magnitude is very small (Column 6). This suggests that there might be a non-linear association between total amount of term-time working experience and the probability of being employed before graduation.

The magnitudes of the coefficients on the three measures are all very small. One more month worked in term time is associated with a 1.03 percentage points increase in the probability of being employed before graduation (Column 1). One additional hour worked per week and one additional full-time equivalent day worked during term time are associated with about 0.23 and 0.15 percentage points increase in the probability of being employed respectively (Columns 3 and 6). Yet when multiplied by the means of these variables, the sizes of the associations are comparable to what is found for term-time working participation. As shown in corresponding columns in the table, compared to those who never worked in term time, the probability of being employed is about 5.82 percentage points higher for students who worked at the average level of length, about 5.55 percentage points higher for those who worked at the average level of intensity, and about 9.87 percentage points higher for those who worked at the average level of accumulated days. The magnitude of the difference for accumulated days is the largest among the three measures, and it is even larger than the coefficient of term-time working participation. This suggests that the accumulated days is the major factor that influences the impact of participation in term-time working. It is reasonable as this variable captures the variation in the total amount of working experience accumulated during term time.

Overall, the basic models provide evidence of a significant and positive association between term-time working and initial employment status. The impact is mainly captured by the total accumulated amount of working experience. The results also show that off-term working has an even stronger association with the initial employment status than term-time working.

6.1.2.2 Impact on starting salary

The model used to estimate the impact of term-time working on starting salary is expressed in Equation 3.4:

$$log(Salary_i) = \gamma_0 + \gamma_1 W_i + \gamma_2 W_i^2 + \gamma_3 S_i + \gamma_4 X_i + \mu_i \quad (3.4)$$

where the dependent variable, $log(Salary_i)$, is the log form of starting monthly wage, W_i is a measure of term-time working experience, S_i is schooling attainment as specified in Equation 3.3, and X_i is a set of covariates as specified in Section 3.3.2.1. The model is estimated with OLS regression, and the results are presented in Table 6.3. It needs to be pointed out that the sample used to estimate the impact on starting salary contains only students who are in the "Intention-to-Work" sample, got an offer before graduation, and reported the wage of the offer in the CSLM 2011 survey. This subsample is referred to as the "Have wage" sample hereafter.

Table 6.4 presents the OLS estimates of the impact of working participation and Table 6.5 presents the OLS estimates of the impacts of length, intensity, and total amount of term-time working experience. Quadratic forms are added to the models in Table 6.5. Off-term working participation and the covariate set specified in Section 3.3.2.1 are included in all models in Table 6.4 and 6.5. As shown in Table 6.4, none of the coefficients on the participation in in-college working, term-time working, and off-term working are statistically significant, suggesting that working during college in general does not influence the starting monthly wage of college graduates who are able to get a job. As shown in Table 6.5, however, the total months worked in term time and accumulated full-time equivalent working days are statistically significantly and positively associated with starting monthly wage. The magnitudes of the associations are small though. One additional month worked in term time is associated with 0.51% increase in starting monthly wage, and one additional full-time equivalent day accumulated in term time is associated with an increase of 0.04%. The intensity of term-time working is not statistically significantly associated with starting monthly wage. In addition, the quadratic forms of the length, intensity, and total amount of term-time working experience are all not statistically significant, suggesting no existence of non-linearity in the associations with measures of term-time working experience and starting monthly wage.

Table 6.4 OLS estimates of the impact of term-time working on starting salary (Dependent variable: starting monthly wage)

	(1) In-college working	(2) Term-time working	(3) Term-time & off-term working
Ever worked in college	-0.0263		
	(0.0264)		
Ever worked in term-time		-0.0147	-0.0147
		(0.0212)	(0.0212)
Ever worked in vacations			-0.000307
			(0.0188)
Migrant to work	0.0992***	0.119***	0.119***
	(0.0256)	(0.0273)	(0.0272)
Age	0.00758	0.00516	0.00516
	(0.00925)	(0.00980)	(0.00978)
Female	-0.0867***	-0.0893***	-0.0893***
	(0.0211)	(0.0217)	(0.0217)
Minority	0.0104	0.0234	0.0234
	(0.0442)	(0.0465)	(0.0464)
Single child	-0.000371	0.0130	0.0130
	(0.0241)	(0.0243)	(0.0243)
From rural area	-0.0417	-0.0332	-0.0332
	(0.0258)	(0.0263)	(0.0263)
SES score	0.0196	0.0167	0.0167
	(0.0139)	(0.0141)	(0.0141)
Science or Engineering major	-0.0315	-0.0198	-0.0199
	(0.0345)	(0.0352)	(0.0352)
Economics or Management major	-0.128***	-0.121***	-0.121***
	(0.0358)	(0.0350)	(0.0350)
Student leader in senior high school	0.0413*	0.0404*	0.0404*
	(0.0187)	(0.0195)	(0.0195)
Humanity track in high school	-0.0637+	-0.0492	-0.0492
	(0.0338)	(0.0343)	(0.0343)
Arts or athlete student in high school	-0.00649	0.00622	0.00622
	(0.0599)	(0.0634)	(0.0634)
NCEE score (rescaled to 1~100)	0.00693***	0.00719***	0.00719***
	(0.00175)	(0.00183)	(0.00185)

Average course score	0.000147	-0.000285	-0.000285
	(0.00175)	(0.00175)	(0.00175)
Have a minor	-0.00516	-0.00255	-0.00258
	(0.0326)	(0.0335)	(0.0335)
Preference degree of one's major	0.0203+	0.0200+	0.0200+
	(0.0109)	(0.0113)	(0.0113)
Pass CET-6	0.142***	0.139***	0.139***
	(0.0305)	(0.0314)	(0.0316)
Pass CET-4	0.0591*	0.0572*	0.0572*
	(0.0257)	(0.0265)	(0.0266)
Student leader	0.0314	0.0426+	0.0426+
	(0.0224)	(0.0233)	(0.0233)
CCP member	0.0334	0.0267	0.0267
	(0.0218)	(0.0227)	(0.0227)
Have professional certificates	-0.0128	-0.0222	-0.0222
	(0.0180)	(0.0185)	(0.0184)
Have merit-based aid	0.0368+	0.0411+	0.0412+
	(0.0215)	(0.0214)	(0.0214)
Have need-based aid	-0.0322	-0.0322	-0.0322
	(0.0209)	(0.0212)	(0.0212)
Have loan	-0.0214	-0.0322	-0.0322
	(0.0208)	(0.0215)	(0.0216)
% of low-SES students in the institution	-0.0349	0.0177	0.0176
	(0.151)	(0.160)	(0.159)
Comprehensive institutions	0.0935*	0.0925*	0.0925*
	(0.0400)	(0.0415)	(0.0415)
Engineering-concentrated institutions	0.0419	0.0382	0.0382
	(0.0290)	(0.0296)	(0.0297)
"985" institution	0.134***	0.138***	0.138***
	(0.0378)	(0.0399)	(0.0399)
"211" institution	0.126***	0.131***	0.131***
	(0.0205)	(0.0212)	(0.0213)
Independent college	-0.0711	-0.0708	-0.0707
	(0.0471)	(0.0522)	(0.0523)
Institution located in central or west area	0.0225	0.00927	0.00932
	(0.0276)	(0.0290)	(0.0292)
Constant	6.955***	6.965***	6.965***
	(0.285)	(0.296)	(0.295)
N	3,146	2,955	2,955
R-squared	0.332	0.344	0.344
adj. R-squared	0.309	0.321	0.321

Notes: 1. Sampling weights are applied and robust standard errors are in parentheses.
2. Industry, employer type, province of workplace, and missing dummies are included.
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Table 6.5 OLS estimates of the impact of term-time working on starting salary (Dependent variable: starting monthly wage)

	(1) Length	(2) Length_sq	(3) Intensity	(4) Intensity_sq	(5) Total amount	(6) Total amount_sq
Total months worked during term time	0.00510***	0.00489				
	(0.00148)	(0.00371)				
Square of total month		0.00000859				
		(0.000135)				
Average hours worked per week during term time			-0.000175	0.00231		
			(0.000548)	(0.00194)		
Square of average hour				-0.0000535		
				(0.0000415)		
Accumulated full-time equivalent working days during term time					0.000372**	0.000413
					(0.000139)	(0.000263)
Square of totalday						-0.000000107
						(0.000000722)
Ever worked in vacations	-0.00222	-0.00220	0.00533	0.00657	0.00182	0.00172
	(0.0182)	(0.0182)	(0.0194)	(0.0193)	(0.0187)	(0.0187)
Migrant to work	0.128***	0.128***	0.102***	0.104***	0.106***	0.106***
	(0.0292)	(0.0293)	(0.0282)	(0.0284)	(0.0294)	(0.0293)
Age	-0.000274	-0.000296	0.00953	0.00959	0.00312	0.00313
	(0.00979)	(0.00978)	(0.00983)	(0.00989)	(0.00948)	(0.00948)
Female	-0.0917***	-0.0917***	-0.0901***	-0.0932***	-0.0937***	-0.0938***
	(0.0211)	(0.0211)	(0.0219)	(0.0219)	(0.0213)	(0.0213)
Minority	0.00463	0.00459	0.0104	0.0106	-0.0135	-0.0132
	(0.0392)	(0.0392)	(0.0515)	(0.0516)	(0.0427)	(0.0426)
Single child	0.0257	0.0257	0.0284	0.0291	0.0290	0.0289
	(0.0239)	(0.0239)	(0.0255)	(0.0254)	(0.0254)	(0.0254)
From rural area	-0.0388	-0.0388	-0.0241	-0.0230	-0.0339	-0.0342
	(0.0262)	(0.0263)	(0.0259)	(0.0257)	(0.0254)	(0.0253)
SES score	0.0190	0.0189	0.0188	0.0205	0.0206	0.0206
	(0.0141)	(0.0141)	(0.0133)	(0.0133)	(0.0132)	(0.0132)
Science or Engineering major	-0.00601	-0.00615	-0.0299	-0.0279	-0.0202	-0.0203
	(0.0340)	(0.0340)	(0.0362)	(0.0360)	(0.0345)	(0.0345)
Economics or Management major	-0.125***	-0.125***	-0.147***	-0.146***	-0.147***	-0.147***
	(0.0341)	(0.0340)	(0.0351)	(0.0351)	(0.0343)	(0.0343)
Student leader in senior high school	0.0251	0.0251	0.0387+	0.0381+	0.0225	0.0224
	(0.0187)	(0.0187)	(0.0200)	(0.0200)	(0.0190)	(0.0191)

Humanity track in high school	-0.0195	-0.0194	-0.0380	-0.0369	-0.0166	-0.0169
	(0.0328)	(0.0327)	(0.0353)	(0.0352)	(0.0333)	(0.0331)
Arts or athlete student in high school	0.00943	0.00942	0.0126	0.0133	0.0162	0.0156
	(0.0622)	(0.0622)	(0.0612)	(0.0612)	(0.0608)	(0.0606)
NCEE score (rescaled to 1~100)	0.00708***	0.00708***	0.00712***	0.00713***	0.00722***	0.00721***
	(0.00182)	(0.00182)	(0.00188)	(0.00188)	(0.00186)	(0.00186)
Average course score	-0.000209	-0.000213	-0.000791	-0.000744	-0.000134	-0.000127
	(0.00166)	(0.00166)	(0.00183)	(0.00183)	(0.00173)	(0.00173)
Have a minor	-0.0233	-0.0232	-0.0310	-0.0303	-0.0315	-0.0317
	(0.0339)	(0.0338)	(0.0329)	(0.0330)	(0.0332)	(0.0332)
Preference degree of one's major	0.0218+	0.0218+	0.0157	0.0158	0.0185	0.0186+
	(0.0112)	(0.0113)	(0.0115)	(0.0115)	(0.0113)	(0.0112)
Pass CET-6	0.135***	0.135***	0.144***	0.146***	0.139***	0.139***
	(0.0308)	(0.0308)	(0.0317)	(0.0315)	(0.0302)	(0.0302)
Pass CET-4	0.0509*	0.0508*	0.0723**	0.0733**	0.0690**	0.0689**
	(0.0256)	(0.0256)	(0.0266)	(0.0266)	(0.0256)	(0.0256)
Student leader	0.0343	0.0343	0.0459+	0.0449+	0.0448+	0.0447+
	(0.0232)	(0.0232)	(0.0238)	(0.0237)	(0.0237)	(0.0237)
CCP member	0.0319	0.0319	0.0267	0.0280	0.0306	0.0307
	(0.0226)	(0.0226)	(0.0228)	(0.0227)	(0.0225)	(0.0225)
Have professional certificates	-0.0209	-0.0209	-0.0137	-0.0142	-0.0130	-0.0130
	(0.0185)	(0.0185)	(0.0187)	(0.0187)	(0.0184)	(0.0185)
Have merit-based aid	0.0365+	0.0366+	0.0455*	0.0432*	0.0405+	0.0402+
	(0.0215)	(0.0215)	(0.0217)	(0.0219)	(0.0215)	(0.0214)
Have need-based aid	-0.0393+	-0.0393+	-0.0443*	-0.0463*	-0.0461*	-0.0464*
	(0.0213)	(0.0213)	(0.0209)	(0.0211)	(0.0209)	(0.0209)
Have loan	-0.0332	-0.0331	-0.0292	-0.0306	-0.0279	-0.0281
	(0.0218)	(0.0218)	(0.0218)	(0.0217)	(0.0213)	(0.0214)
% of low-SES students in the institution	-0.0391	-0.0386	-0.0200	-0.0196	-0.0792	-0.0805
	(0.161)	(0.160)	(0.166)	(0.165)	(0.168)	(0.168)
Comprehensive institutions	0.0724+	0.0723+	0.0851*	0.0843*	0.0693	0.0699
	(0.0422)	(0.0423)	(0.0418)	(0.0418)	(0.0427)	(0.0426)
Engineering-concentrated institutions	0.0382	0.0381	0.0342	0.0346	0.0410	0.0416
	(0.0306)	(0.0306)	(0.0304)	(0.0303)	(0.0305)	(0.0306)
"985" institution	0.151***	0.151***	0.144***	0.145***	0.161***	0.161***
	(0.0401)	(0.0401)	(0.0409)	(0.0407)	(0.0404)	(0.0404)
"211" institution	0.136***	0.136***	0.133***	0.133***	0.137***	0.136***
	(0.0211)	(0.0211)	(0.0215)	(0.0215)	(0.0214)	(0.0214)
Independent college	-0.0746	-0.0746	-0.0741	-0.0696	-0.0700	-0.0699
	(0.0531)	(0.0531)	(0.0571)	(0.0572)	(0.0556)	(0.0556)
Institution located in central or west area	0.0256	0.0255	0.0258	0.0270	0.0401	0.0404
	(0.0296)	(0.0295)	(0.0302)	(0.0301)	(0.0304)	(0.0304)

Constant	7.070***	7.072***	6.901***	6.883***	6.984***	6.983***
	(0.299)	(0.299)	(0.297)	(0.297)	(0.289)	(0.29)
N	2,852	2,852	2,695	2,695	2,643	2,643
R-squared	0.356	0.356	0.351	0.351	0.362	0.362
Adj. R-squared	0.332	0.331	0.325	0.325	0.337	0.336

Notes: 1. Sampling weights are applied and robust standard errors are in parentheses.
2. Industry, employer type, province of workplace, and missing dummies are included.
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

The above results suggest that participation in term-time working is not statistically significantly associated with starting monthly wage, but the length and total amount of term-time working have a significant association with starting monthly wage. This is understandable because 77.7% of students in the "Have wage" sample worked during term time. The major variation in term-time working is not captured by whether or not a student worked in term time, but by how much the student worked in term time. The means of the length and total amount of term-time working experience in the analytic sample are 6.15 months and 68.78 days respectively, and the standard deviations are 6.60 and 82.24 respectively. It means that, compared to that of students with no term-time working experience, the starting monthly wage is about 3.2% higher for students who worked for the average amount of months in term time, and about 2.8% higher for those who accumulated average amount of full-time equivalent working days in term time. In models not reported here, the total months and accumulated days worked in college and in vacations are used as measures of in-college working and off-term working respectively. The coefficients are all statistically significant and positive, though the magnitudes are all very small.[22] This confirms that what is important for starting salary is not the participation in working, but the total accumulated amount of working experience. This finding is consistent with the conclusion in the previous section.

However it needs to be point out that, the standard deviations of the length and total amount of term-time working are larger than the means. As there is not negative value in these variables, the large standard deviations indicate extreme positive values. By checking the distribution of the variables, it is found that the 95th percentile of term-time working length in the "Intention-to-Work" sample is 19, while the maximum value is 37.5; and the 95th percentile of the total amount of term-time working is 192, while the maximum value is 826. These outliers may influence the estimation of the impacts. Therefore they are removed in order to check the robustness of the associations. The results are presented in Panel 1 of Table 6.6. As it shows, the estimated coefficients on length and total amount of term-time working become insignificant after removing the outliers, and the magnitudes become smaller. This suggests that the significant associations between the starting salary and the length and total amount of term-time working are driven by these outliers.

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[22] When the total months of term time working and off-term working are added into the model simultaneously, both the coefficients become insignificant. This is because there is strong collinearity between these two variables. The VIF is very close to 5. Therefore in models presented in Table 6.5, the variable used to control for off-term working experience is the participation but not the total months of off-term working.

Table 6.6 Estimation of the impact of term-time working on labor market outcomes without outliers

	(1)	(2)	(3)	(4)
	Length	**Length_sq**	**Total amount**	**Total amount_sq**
(1) Dependent variable: starting monthly wage				
Total months worked during term time	0.00352	-0.00473		
	(0.00247)	(0.00677)		
Square of total month		0.000627		
		(0.000458)		
Accumulated full-time equivalent working days during term time			0.000240	0.000426
			(0.000229)	(0.000611)
Square of total day				-1.27E-06
				(4.15E-06)
Ever worked in vacations	-0.00647	-0.00556	0.00311	0.00293
	(0.0188)	(0.0188)	(0.0194)	(0.0194)
N	2,705	2,705	2,525	2,525
R_sq	0.354	0.355	0.367	0.367
(2) Dependent variable: initial employment status				
Total months worked during term time	0.0122**	0.0240*		
	(0.00371)	(0.00935)		
sample mean	4.47			
coef*sample mean	0.0545			
Square of total month		-0.000951		
		(0.000692)		
Accumulated full-time equivalent working days during term time			0.00174***	0.00139
			(0.000347)	(0.000891)
Square of totalday			47.32	
			0.0823	
sample mean				2.69E-06
coef*sample mean				(6.04E-06)
Ever worked in vacations	0.127***	0.125***	0.111***	0.111***
	(0.0251)	(0.0252)	(0.0258)	(0.0258)
N	4,157	4,157	3,875	3,875
Psuedo R_sq	0.231	0.231	0.235	0.235

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. Full set of covariates is included in each model;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

A similar robustness check is done for the associations between the initial employment status and the length and total amount of term-time working. The results are presented in Panel 2 of Table 6.6. The coefficient on the length of term-time working remains statistically significant after removing the outliers, and the magnitude does not change much. The coefficient on the total amount of term-time working remains statistically significant as well, but the magnitude becomes larger than before. In addition, the quadratic form of total amount of term-time working becomes insignificant. Multiplying the coefficients with the means of corresponding variables in the analytic sample, the differences in the probabilities of being employed between students who never worked in term time and who worked at the average levels of length and total amount get closer to the estimated coefficient of participation in term-time working presented in Column 3 of Table 6.2. These results suggest that the outliers are also influential in the estimation of the associations between the probability of being employed and the length and total amount of term-time working experience, but not as strong as in the estimation on starting salary. Checking the distribution of key variables, no systematic difference is found between the outliers and the rest of the sample. Therefore the outliers are kept in the main analysis, but a caveat should be born in mind in interpretation.

In summary, the analyses in Sections 6.1.2.1 and 6.1.2.2 find that the participation, length, intensity, and total amount of term-time working are all statistically significantly associated with higher probability of being employed before graduation. Participation in term-time working and the intensity of term-time working is not significantly associated with starting salary, but the length and total amount of term-time working experience are statistically significantly associated with higher starting salary. These findings are in general consistent with pervious Chinese studies on the determinants of college graduates' labor market outcomes. Many of these studies found significant and positive associations between taking internships and/or part-time jobs in college and the likelihood of being employed after graduation (He & Zhang, 2006; Huang, 2007; Lai et al., 2012; H. Li et al., 2012; Qing & Zeng, 2009; Qing, 2012; Ren et al., 2013; Xie & Li, 2010; Yue et al., 2004). Though these studies do not differentiate between whether the working experience is during term time or vacations, the direction and significance level of the associations are consistent with the findings in this analysis. Previous studies also found no significant associations with in-college working participation and starting salary (Lai, et.al, 2012; Yue, et.al, 2004; Du & Yue, 2010; Qing & Zeng, 2009), which is also consistent with the results shown in Table 6.4. What is not quite consistent is H. Li, et.al (2011) study. Using the CSLM 2010 data, they found a statistically significant but negative association between "having part-time working experience" in college and starting monthly wage. However, as there is no detailed information about the definition of their "part-time working", it is hard to determine whether the finding in their study is comparable to the findings here. In addition, the sample used in H. Li, et al's (2012) study contains only 19 institutions, including one three-year vocational college. The different composition of the samples may also induce differences in estimations. Nevertheless, there is still some similarity between the results of this analysis and H. Li, et al's (2012) study. As shown in Table 6.4, the coefficients on participations in in-college working and term-time working are all negative, though not statistically significant. H. Li, et al's (2012) study also found that having part-time working experiences is significantly associated with a higher probability of being observed a starting wage, which implies that students with part-time working experience are more likely to be offered a job by the time of the survey.

6.1.2.3 Other determinants of early post-college labor market outcomes

The estimation of Equations 3.3 and 3.4 provide some evidence on the influence of covariates on early post-college labor market outcomes. As shown in Tables 6.2 and 6.3, students' individual and family background, ability and academic achievement, college experience, and institutional characteristics all influence their labor market outcomes.

Among individual and family background variables, being female is statistically significantly and negatively associated with both the initial employment status and the starting salary. Compared to male students, the probability of being offered a job is about 6 percentage points lower for female students, and the starting monthly wage is about 9% lower, other things equal. This finding suggests that female students are in a disadvantaged position in the labor market in China, consistent with previous studies (Du & Yue, 2010; C. Guo et al., 2010; Lai et al., 2012; Qing & Zeng, 2009). Being the only child in one's family is statistically significantly associated with lower probability of being employed, but not associated with starting monthly wage. Other individual and family background variables, including age, race, whether from rural area, and family SES score, are not statistically significantly associated with either the initial employment status or the starting salary. Some previous Chinese studies also found that whether from rural area is not significantly associated with labor market outcomes (Du & Yue, 2010). With regards to family background, some studies find that family background as measured by family income, parent's education level, parents' occupation, and social capital is significantly and positively associated with students' labor market outcomes (Du & Yue, 2010; Lai et al., 2012). But there are also some studies that find no impact of family background on labor market outcomes (Ren, J.Guo, & Pan, 2013).

Students' innate ability is positively associated with their labor market outcomes. As shown in the table, students with higher non-cognitive skills before college as measured by whether was a student leader in high school are statistically significantly more likely to be offered a job with higher wage before graduation. Students' initial cognitive skill measured by NCEE score is also statistically significantly associated with higher starting monthly wage, but is not associated with the probability of being employed. This is consistent with the finding by Guo, Tsang, & Ding (2010).

As for students' academic performance, the analysis found that the average course score in college is statistically significantly but negatively associated with the probability of being employed, and is not significantly associated with the starting monthly wage. The magnitude of the association is not large though: one point higher in average course score is associated with a decrease of about 0.5 percentage points in the probability of being offered a job. Previous Chinese studies find mixed results about the impact of academic performance on labor market outcomes. For instance, Ren, J.Guo, & Pan (2013) and Du & Yue (2010) found positive impacts of excellent academic performance on initial employment status and starting salary; Guo, Tsang, & Ding (2010) and Lai, Meng, & Su (2012) found negative impacts; and Huang (2007) found no statistically significant impact. As for the influence of academic performance on students' starting salary, the OLS regressions suggest that the association is not statistically significant.

Another measure of academic achievement, students' English proficiency, is shown to be statistically significantly associated with higher starting monthly wage. Compared to the starting wage of students who did not pass the CET-4 test, the wage for those who passed CET-4 test is about 6% higher on average, and the wage for those who passed

CET-6 is about 14% higher. This suggests that students with better English skills are more likely to get higher-paid jobs. The estimates of the associations between CET certificates and initial employment status are not consistent across different model specifications. The coefficients on passing CET-4 are not statistically significant in most models of initial employment status, whereas most of the coefficients on passing CET-6 are statistically significant and positive. This suggests that CET-6 certificate may be associated with a higher probability of being employed. This is understandable as the CET-4 certificate is more common than CET-6 certificate among college graduates. Some previous studies found similar impact of English proficiency. For instance, Guo, Tsang, & Ding's (2010) study found that the CET certificates influence the starting wage but not the initial employment status, and Li, Meng, & Shi (2012) found that CET-4 score is statistically significantly associated with higher starting wage. Some other previous findings are not that consistent. For instance, Huang (2007) found that passing CET-4 test is significantly associated with higher probability of being employed; and Lai, Meng, & Su (2012) and Du & Yue (2010) found that passing CET-4 and/or CET-6 tests has positive impacts on both initial employment status and starting salary. Nevertheless, all these studies reveal that students' English proficiency is positively related to their early post-college labor market performance.

Among college experience, students' major significantly influence their labor market outcomes. Students in science and engineering majors are statistically significantly more likely to be offered a job than students with humanity majors; while students with an economics and management major tend to have lower starting salary than humanity students. In addition, students with more positive attitude towards their major are statistically significantly more likely to be employed. As for other college activities, whether has a minor, whether is a CCP member, and whether is a student leader are not statistically significantly association with either the initial employment status or the starting salary. This is a litter different from previous studies which found these factors to be important for labor market outcomes (Du & Yue, 2010; Huang, 2007; Lai et al., 2012; H. Li et al., 2012; Ren et al., 2013). Whether has professional certificates is marginally statistically significantly associated with the probability of being employed, but not with the starting monthly wage. Previous studies found similar findings (Huang, 2007; Lai et al., 2012; Ren et al., 2013). Finally, students with higher financial needs, i.e. those who have need-based financial aids and/or loans, are more likely to get employed. But their starting wage tends to be lower, though not all the coefficients are statistically significant in the models. This suggests that students with higher financial need may be in badly need of a job and therefore tend to apply to less selective jobs which provide lower salary.

With regards to institutional characteristics, both the academic ranking and concentration of an institution influence its graduates' labor market outcomes. Holding other things constant, the probability of being employed is about 8 to 9 percentage points higher for graduates from "985" institutions than those in non-key institutions, and the starting monthly wage of graduates from "985" institutions are about 13% to 16% higher than that for graduates from non-key institutions. Graduates from "211" institutions do not have advantages over students in non-key institutions with regards to the probability of being employed, but their starting monthly wage is about 13% to 14% higher. This finding is in general consistent with previous studies (Du & Yue, 2010; C. Guo et al., 2010; Lai et al., 2012; H. Li et al., 2012; Qing & Zeng, 2009; Qing, 2012). With regards to the academic concentration, students in engineering-concentrated institutions are more likely to be offered a job, compared to students in institutions with other concentrations. But they have similar level of starting wage. This is consistent with the findings on the influence of science and engineering majors. Students in comprehensive institutions have higher starting salaries, but not higher probability of being offered a job.

In summary, the basic model analysis shows that term-time working is positively associated with higher probability of being offered a job before graduation, but is in general not associated with starting salary. Male students, students with higher innate ability and higher academic achievement, students with science and engineering majors and professional certificates, and students from elite institution are in a more advantaged place in the labor market.

6.1.3 Estimates with quasi-experimental strategies

As discussed in Section 3.3.2.2, the basic model estimates may be biased by the endogeneity problem. There might be a positive self-selection into term-time working with regards to labor market outcomes, if students with higher ability were more likely to work. On the other hand, it is also possible that the self-selection is negative, if students who are originally in a disadvantaged position in the labor market intentionally work more in college in order to improve their competitiveness. The later scenario seems to be more plausible, as previous studies show that the primary reason for Chinese undergraduates to work in college is to gain working experience. In addition, the analysis in Section 4.3 shows that female students and students with lower NCEE scores are more likely to work in term time. These students are less likely to get a job offer or less likely to get a high-paying offer after graduation, as suggested by the results from the basic models. By contrast, CCP members and students in engineering-concentrated institutions are less likely to work in term time. According to the findings in this study and previous studies, it is easier for these students to find a job after graduation. The above evidence suggests that the selection into term-time working might be negative with regards to potential labor market outcomes. The naïve estimates of the impacts of term-time working might be downward biased. This section addresses the endogeneity problem with the PSM and IV strategies. The results are presented in Sections 6.1.3.1 and 6.1.3.2 respectively.

6.1.3.1 Application of Propensity Score Matching strategy

As described in earlier chapters, the PSM strategy first estimates the probability of working in term time with available covariates, and then matches up term-time working with non-term-time working students based on their propensity score. This section uses the same propensity score model as in Section 5.1.2, but performs the matching with different samples of students. First, in order to estimate the impact on the initial employment status, the matching is performed with students in the “Intention-to-Work” sample. Second, to estimate the impact on starting salary, the matching is performed with students in the “Have wage” sample. Figures 6.1 and 6.2 present the common support for each sample. Though the *psmatch2* procedure in Stata 12 reports that all observations are on the common support in both samples, both graphs show that there are very few treated observations at the left end. Therefore further analyses are restricted to observations on the overlap of the propensity scores.

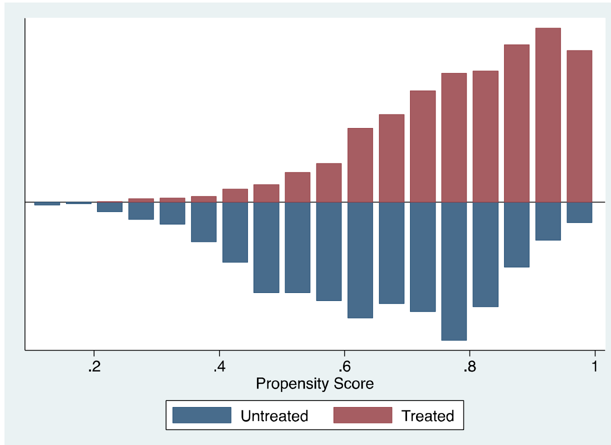

Figure 6.1 Distribution of the p-score of treated and untreated groups of the "Intention-to-Work"

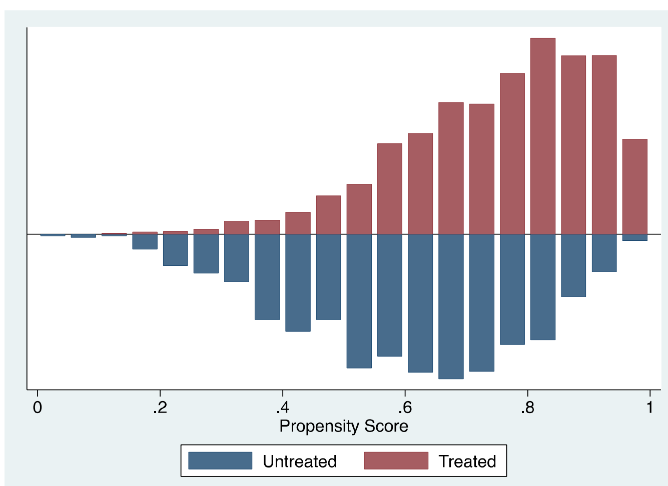

Figure 6.2 Distribution of the p-score of treated and untreated groups of the "Have wage" sample

Similar to Section 5.1.2, the Nearest Neighbor, Kernel, and Radius Caliper matching algorithms are applied to match up term-time working and non-term-time working students by elite and non-elite institutions. Table 6.7 presents the balance checks on the covariates after each matching process for each sample.[23] As shown in the table, in both samples, the Nearest Neighbor matching does not achieve good balance on the covariates in both samples; therefore the groups matched by Nearest Neighbor matching are not used in further estimations. The Kernel and Radius Caliper matching process successfully reduce the standard deviations (STD) of all covariates to below 0.1 in both samples. However, in the "Have wage" sample, the balance within elite and non-elite institutions are not achieved for five covariates: age, household income, high school humanity track, whether worked in high school, and whether has a minor. The STDs for these variables remain larger than 0.1 after the matching. This may because the size of "Have wage" sample is relatively small (2,955 observations after removing observations with missing values in term-time working participation) and 76% of the observations have term-time working experience. There may not be enough observations in each subgroup to achieve balance in all covariates within the group. Therefore the sub-sample analysis by elite and non-elite institutions may not be appropriate for the impact on starting salary. Thus only the full sample analysis is presented. For the impact on initial employment status, both full sample analysis and sub-sample analysis are conducted as the balance within elite and non-elite institutions are successfully achieved.

Table 6.8 presents the regression adjusted propensity matched estimates with the full samples. The covariates used in Equations 3.3 and 3.4 are added to corresponding

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[23] Additional balance checks of the distribution of continuous variables are presented in Figure A3.2 and Figure A3.3 in Appendix 3.

models. Participation in off-term working is also controlled for in all models. Only the coefficients on term-time working are presented. The full tables are presented in Table A3.3 in Appendix 3. Panel 1 shows the estimated impact of term-time working on initial employment status, and Panel 2 shows the estimated impact on starting monthly wage. The probit and OLS estimates without sampling weight are provided for comparison.

As shown in Panel 1, the PSM estimates with different matching algorithms are all statistically significant and positive. The magnitudes are larger than the probit estimates, suggesting that the naïve probit estimates tend to be downward biased, and the positive impact of term-time working on the probability of being offered a job is underestimated. With regards to the impact of term-time working on starting monthly wage, as shown in Panel 2, both the OLS estimate without sampling weight and the PSM estimates are not statistically significant. In addition, the estimates are all negative, but the magnitudes of the PSM estimates are smaller than that of the OLS estimate. This also suggests that the OLS estimate tends to be downward biased. Overall, the PSM estimates suggest that term-time working participation is significantly and positively associated with college graduates' initial employment status, but is not significantly associated with the starting salary. This finding is consistent with the basic models.

Table 6.7 Balance checks of Propensity Score Matching

(Statistics presented: Standardized difference between treated and untreated groups)

	(1) Matching on "Intention-to-work" sample				(2) Matching on "Have wage" sample			
	Pre-matched	Post-matched			Pre-matched	Post-matched		
		Nearest neighbor matching	Kernel matching	Radius caliper matching		Nearest neighbor matching	Kernel matching	Radius caliper matching
Student leader in high school	0.169	-0.011	0.000	0.002	0.148	0.026	-0.012	-0.012
NCEE score	-0.151	0.026	0.005	0.002	-0.208	-0.002	-0.04	-0.043
Worked in high school	0.011	0.051	-0.015	-0.016	0.028	-0.059	-0.015	-0.013
Preference degree of one's major	0.028	-0.028	-0.050	-0.047	-0.019	-0.033	-0.049	-0.047
Tuition (sticker price)	-0.122	-0.02	0.006	0.008	-0.088	0.022	0.012	0.011
Amount of financial aid	0.256	0.036	0.007	0.009	0.328	-0.065	0.022	0.032
Have merit-based aid	0.239	0.005	-0.027	-0.023	0.233	-0.014	-0.028	-0.024
Have need-based aid	0.397	0.078	0.039	0.039	0.368	0.014	0.043	0.047
Have loan	0.238	0.014	0.088	0.086	0.189	0.082	0.063	0.059
Age	0.134	-0.009	0.023	0.023	0.106	0.156	0.089	0.087
Female	0.335	0.081	0.030	0.031	0.38	0.002	0.041	0.046
Minority	-0.017	-0.028	0.009	0.01	0.014	-0.043	0.054	0.058
From municipalities	0.057	-0.018	-0.031	-0.031	0.106	0.018	-0.06	-0.063
From central or west area	0.054	0.003	0.005	0.006	0.022	-0.09	0.008	0.01
From rural area	0.235	0.058	0.038	0.038	0.172	-0.055	0.015	0.021
Single child	-0.249	-0.008	0.004	0.001	-0.175	0.029	-0.029	-0.033
Household income	-0.135	-0.103	-0.056	-0.056	-0.087	-0.015	-0.044	-0.046
SES score	-0.227	-0.028	-0.026	-0.027	-0.193	0.057	0.005	0
Humanity track in high school	0.125	-0.062	-0.028	-0.028	0.199	-0.051	-0.055	-0.054
Arts or athlete student in high school	0.143	0.077	0.021	0.027	0.218	0.009	0.081	0.086
Science or Engineering major	-0.256	0.019	-0.006	-0.009	-0.361	0.041	-0.005	-0.011
Economics or Management major	0.061	-0.102	-0.028	-0.026	0.088	-0.039	-0.046	-0.047
Have a minor	0.027	-0.1	-0.063	-0.057	0.073	-0.101	-0.065	-0.066
CCP member	0.069	0.029	-0.005	-0.006	0.051	0.003	-0.042	-0.036

Student leader	0.068	-0.081	-0.053	-0.051	0.072	-0.175	-0.098	-0.097
Institution located in municipalities	0.035	-0.011	-0.005	-0.005	0.112	0.113	0.016	0.013
Institution located in central or west area	-0.035	-0.031	-0.037	-0.036	-0.123	-0.101	-0.051	-0.049
Comprehensive institutions	0.103	-0.016	-0.041	-0.042	0.148	0.064	-0.019	-0.021
Engineering-concentrated institutions	-0.172	0.037	0.003	0.002	-0.286	-0.098	-0.017	-0.02
985 institutions	-0.019	0.028	0.012	0.01	-0.026	-0.068	0.018	0.022
211 institutions	-0.062	-0.019	-0.008	-0.007	-0.053	0.048	-0.013	-0.015
Independent institutions	-0.119	0	-0.003	-0.003	-0.138	-0.021	-0.004	-0.004
Campus located in suburban	-0.004	-0.032	-0.021	-0.02	0.032	-0.165	-0.056	-0.055
Percentage of low SES students	0.044	0.039	0.030	0.03	-0.051	-0.038	0.033	0.037
Percentage of term-time working students	0.387	-0.028	0.030	0.033	0.355	0.118	0.034	0.036

Table 6.8 PSM estimates of the impact of term-time working participation on labor market outcomes

Panel 1. Initial employment status				
	Estimation strategy	**Probit**	**N**	**Pseudo R-sq**
(1) Whole sample	Probit w/o weights	0.0786***	4,496	0.212
		(0.0172)		
	Kernel matching	0.0921***	4,431	0.237
		(0.0219)		
	Radius caliper matching	0.0916***	4,431	0.238
		(0.0218)		
(2) Elite institutions	Probit w/o weights	0.0811**	1,906	0.255
		(0.0259)		
	Kernel matching	0.0882**	1,872	0.280
		(0.0298)		
	Radius caliper matching	0.0887**	1,872	0.280
		(0.0299)		
(3) Non-elite institutions	Probit w/o weights	0.0843***	2,585	0.205
		(0.0237)		
	Kernel matching	0.0973***	2,556	0.251
		(0.0288)		
	Radius caliper matching	0.0961***	2,556	0.251
		(0.0286)		
Panel 2. Starting salary				
	Estimation strategy	**OLS**	**N**	**R-sq**
Whole sample	OLS w/o weights	-0.0201	2,955	0.302
		(0.0158)		
	Kernel matching	-0.0141	2,868	0.311
		(0.0174)		
	Radius caliper matching	-0.0142	2,868	0.310
		(0.0174)		

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. In Panel 1, marginal effects are presented;
3. Full set of covariates is included in each model;
4. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

In the subsample analysis on the impact of term-time working participation on initial employment status, as presented in the last two rows of Panel 1, both the probit and the PSM estimates show that the impact is significant for both subsamples, but it is smaller for students in elite institutions than for those in non-elite institutions, suggesting that students in non-elite institutions may benefit more from working in term time. However, the difference in the magnitude of the coefficients is not statistically significant (t-value=0.22 for the PSM estimates). In addition, the results of the basic model analysis by subgroups with the sampling weight, which are presented in the first two columns of Table A4.2 in Appendix 4, show that the association between term-time working and the probability of being offered a job is larger in elite institutions than in non-elite institutions, but the difference is also not statistically significant (t-value=0.82). These results suggest that there is no significant heterogeneous effect of term-time working on college graduates' initial employment status by by elite and non-elite institutions. This finding is supported by the IV strategy presented in the last two columns of Table A4.2 in Appendix 4,[24] which also shows that the difference between the impacts for the two subgroups is not statistically significant (t-value=0.54), though it is slightly larger for students in non-elite institutions than for those in elite institutions.

In summary, the PSM estimates suggest a statistically significant and positive impact of term-time working participation on the probability of being offered a job before graduation, but no significant impact on starting monthly wage. This finding is consistent with the results from the basic model analysis presented in Section 6.1.2,

[24] The application of IV strategy follows the procedure described in next section.

though the magnitudes are not comparable because the sampling weight is not applied in the PSM procedure. The comparison between the PSM estimates and the probit and OLS estimates without sampling weight suggests that the basic model estimates tend to be downward biased. This finding supports the second scenario described at the beginning of Section 6.1.3 that the selection into term-time working might be negatively related to potential labor market outcomes. Yet, as discussed in Section 5.1.2, the PSM estimates are still subject to the Omitted Variable Bias and cannot fully address the endogeneity problem.

6.1.3.2 Application of Instrumental Variable strategy

This section presents the IV estimates of the impact of term-time working on post-college labor market outcomes. The estimation results are presented first. Then some falsification tests are done to test the validity of the instrumental variable.

<u>*The IV estimates*</u>

The procedure of applying the IV strategy is similar to what is described in Section 5.1.3. Two two-stage models are estimated to examine the causal impact of term-time working on initial employment status and starting salary. In each model, the term-time working experience is measured with participation, length, intensity, and total amount. The instrumental variable used here is again the percentage of term-time working students in each institution. The covariates specified in Equations 3.3 and 3.4 are included in corresponding models. Participation in off-term working is also controlled for in all models. Sampling weight is applied in regressions.

What is different from the previous IV analysis is the method used to estimate the model for initial employed status. As the dependent variable is a binary but not continuous variable, the *ivprobit* procedure in Stata 12 is used instead of *ivreg2* that was used for the models of average course score. The *ivprobit* procedure uses the Maximum Likelihood estimation (MLE) instead of the 2SLS method to estimate the models. For models of starting salary, the dependent variable, i.e. log starting monthly wage, is continuous, and therefore *ivreg2* is used and the models are estimated with the 2SLS method. The results are presented in Table 6.9 and Table 6.10.

Table 6.9 shows the marginal effects of the IV estimates on the impact of term-time working on initial employment status. As the table shows, the marginal effects of participation, length, intensity, and total amount of term time working are all statistically significant and positive. [25] The sign and significance level are consistent with the results of basic models presented in Table 6.2. The magnitudes of the IV estimates are larger than the probit estimates, suggesting that the probit estimates may be downward biased. According to the IV estimates, participation in term-time working has a large effect on initial employment status. It increases the probability of being offered a job before graduation by 37.5 percentage points, holding other things constant. This is much larger than the increase of 7.48 percentage points as estimated by the probit model. The impacts of length, intensity, and total amount are relatively small, though still much larger than the probit estimates. One additional month worked in term time increases the probability of being employed before graduation by 3.3 percentage points; one additional

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[25] The model was also estimated with the regular IV procedure (*ivreg2*) but not reported in this dissertation. The point estimates of the marginal effects are similar to the estimates from the *ivprobit* procedure, but the standard errors are larger in *ivreg2* than in *ivprobit*. Therefore the coefficients become insignificant in ivreg2. However, because the outcome is a binary variable, the standard errors from the OLS estimation may not be correct. Therefore the result from the *ivprobit* procedure is preferred.

hour worked per week increases the probability by about 1 percentage point; and one additional full-time equivalent working day accumulated in term time increases the probability by about 0.25 percentage points. Multiplying by the means of the analytic sample, the probability of being offered a job is increased by 18.9, 22.1, and 15.6 percentage points for students who worked at the average level of length, intensity, and total amount respectively, compared to those who never worked in term time. These magnitudes are smaller than the estimated impact of participation in term-time working, suggesting that there might be some characteristics of term-time working other than the length, intensity, and total amount that make the participation in term-time working valuable in the labor market.

Table 6.9 IV estimates of the impact of term-time working on initial employment status (Dependent variables: whether being offered a job before graduation)

	(1) Participation	(2) Length	(3) Intensity	(4) Total amount
Ever worked during term time	0.375**			
	(0.131)			
Total months worked during term time		0.0332*		
		(0.0137)		
sample mean		5.68		
coef*sample mean		0.189		
Average hours worked per week during term time			0.00942*	
			(0.00427)	
sample mean			23.50	
coef*sample mean			0.221	
Accumulated full-time equivalent working days during term time				0.00253*
				(0.00123)
sample mean				61.68
coef*sample mean				0.156
Ever worked in vacations	0.069*	0.0753**	0.0470	0.0545+
	(0.0268)	(0.0254)	(0.0321)	(0.0321)
Age	-0.00416	-0.00735	-0.00557	-0.00868
	(0.00950)	(0.0104)	(0.00931)	(0.0100)
Female	-0.0652**	-0.0647*	-0.0712**	-0.0725**
	(0.0212)	(0.0254)	(0.0227)	(0.0268)
Minority	-0.00297	-0.0147	-0.0223	-0.02541
	(0.0380)	(0.0374)	(0.0416)	(0.0417)

Single child	-0.00180	-0.0469*	-0.0322	-0.05623*
	(0.0286)	(0.0224)	(0.0270)	(0.0232)
From rural area	-0.00479	-0.00817	-0.0116	-0.00626
	(0.0241)	(0.0256)	(0.0253)	(0.0267)
SES score	9.60E-06	0.0149	-0.00127	0.0169
	(0.0134)	(0.0152)	(0.0138)	(0.0166)
Student leader in senior high school	0.0233	0.0290	0.0226	0.0227
	(0.0226)	(0.0243)	(0.0213)	(0.0224)
Humanity track in high school	-0.00504	0.00677	-0.01824	-0.00213
	(0.0292)	(0.0293)	(0.0322)	(0.0305)
Arts or athlete student in high school	0.00476	-0.01923	-0.00399	-0.0187
	(0.0425)	(0.0457)	(0.0452)	(0.0483)
NCEE score (rescaled to 1~100)	0.00411**	0.00224	0.00421*	0.00353*
	(0.00152)	(0.00149)	(0.00166)	(0.00166)
Average course score	-0.00272	-0.0037*	-0.00245	-0.00322
	(0.00188)	(0.00186)	(0.00232)	(0.00220)
Science or Engineering major	0.082**	0.0722*	0.0700*	0.0537
	(0.0305)	(0.0308)	(0.0323)	(0.0372)
Economics or Management major	0.0241	0.0069	0.0154	0.0075
	(0.0288)	(0.0299)	(0.0321)	(0.0337)
Have a minor	0.00628	0.0221	-0.01703	0.00671
	(0.0360)	(0.0376)	(0.0394)	(0.0384)
Preference degree of one's major	0.0389**	0.0453***	0.0415**	0.0455**
	(0.0120)	(0.0123)	(0.0127)	(0.0129)
Pass CET-6	0.0457	0.0604*	0.0634*	0.0708*
	(0.0281)	(0.0290)	(0.0288)	(0.0300)
Pass CET-4	0.0547*	0.0396	0.0653*	0.0604*
	(0.0234)	(0.0247)	(0.0253)	(0.0264)
Student leader	-0.0139	-0.0069	0.0119	0.00816
	(0.0230)	(0.0236)	(0.0244)	(0.0250)
CCP member	0.0472*	0.0354	0.0353	0.0275
	(0.0210)	(0.0222)	(0.0231)	(0.0231)
Have professional certificates	0.0202	0.0267	0.0300	0.0237
	(0.0190)	(0.0205)	(0.0195)	(0.0216)
Have merit-based aid	-0.0192	-0.0088	-0.0134	-0.0133
	(0.0235)	(0.0244)	(0.0248)	(0.0258)
Have need-based aid	0.0279	-0.00405	0.0528+	0.0290
	(0.0275)	(0.0357)	(0.0278)	(0.0315)
Have loan	0.0238	0.000910+	0.000828+	0.000887
	(0.0265)	(0.000525)	(0.000498)	(0.000556)
No. of job applications	0.000831	0.0252	0.0653**	0.054641*
	(0.000524)	(0.0293)	(0.0241)	(0.0269)
% of low-SES students in the institution	0.145	0.157	0.210	0.180
	(0.129)	(0.132)	(0.132)	(0.141)
Comprehensive institutions	0.0133	-0.0078	-0.00590	-0.0086
	(0.0252)	(0.0260)	(0.0271)	(0.0279)

Engineering-concentrated institutions	0.139***	0.140***	0.118***	0.139***
	(0.024)	(0.0252)	(0.0249)	(0.0270)
"985" institution	0.0702*	0.0867**	0.0757*	0.0895**
	(0.0293)	(0.0310)	(0.0309)	(0.0317)
"211" institution	-0.0225	-0.0435*	-0.0142	-0.0301
	(0.0189)	(0.0217)	(0.0223)	(0.0202)
Independent college	-0.0252	-0.0508	-0.0246	-0.0291
	(0.0506)	(0.0468)	(0.0523)	(0.0520)
Institution located in central or west area	-0.00959	-0.0147	-0.04151	-0.03394
	(0.0264)	(0.0287)	(0.0261)	(0.0281)
Institution locates in small city	-0.0744*	-0.0894**	-0.0777*	-0.0872**
	(0.0299)	(0.0259)	(0.0313)	(0.0281)
N	4,496	4,333	4,108	4,028
Log pseudolikelihood	-53.13	-182.13	-225.09	-289.12
IV first-stage regression outputs				
Endogenous variable	**termtime**	**ttdr**	**tthr**	**ttday**
Percent of term-time working students	0.00473***	0.0517***	0.158***	0.591***
	(0.000970)	(0.0101)	(0.0369)	(0.147)
Kleibergen-Paap Wald rk F-stat	23.46	25.98	18.20	15.95
Wald test of exogeneity p-value	0.056	0.098	0.129	0.137

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Marginal effects instead of coefficients are reported.
3. Missing dummies are included.
4. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

At the bottom of Table 6.9 presents the first stage coefficients of the instrumental variable, F-statistics for the weak-identification test, and the p-values of the Wald test of exogeneity reported by *ivprobit*. The Wald test examines whether the correlation between the residuals of the probit equation and the reduced form equation is statistically significantly different from 0. Rejection of the null hypothesis (the correlation equals 0) indicates that there is an endogenous problem in the naïve probit estimation. The F-statistic is the Kleibergen-Paap Wald rk F-statistic reported by *ivreg2*, as the test is not available in *ivprobit* with MLE. Weak-instrument robust test is not reported here, as the Anderson-Rubin test used in Section 5.1.3.2 is not valid with limited dependent variable models (Finlay & Magnusson, 2009), and the tests suggested by Finlay and Magnusson

(2009) in the *rivtest* procedure cannot be called after applying the sampling weight because it requires an assumption of homoskedasticity of the *ivprobit* estimations.

As shown in the table, the first-stage coefficients for the instrumental variable are statistically significant in all models. The F-statistics are all greater than 10, indicating that the weak-IV problem is not severe here. The Wald test fails to reject the null hypothesis of exogeneity in all models, suggesting that the endogeneity problem may not be an issue for the naïve probit estimation. However, the significance level of the Wald test is very sensitive to the use of sampling weights, and it is not clear whether it is reliable when the sampling weights are applied. Previous analyses and discussions do provide some evidence of the existence of the endogeneity problem, and the PSM analysis shows that the probit estimates tend to be downward biased. Therefore the IV estimates are still preferable to probit estimates, despite of the insignificant Wald test. Same as the PSM estimates, the magnitudes of the IV estimates are larger than the probit estimates, suggesting that the probit estimates are downward biased.

Table 6.10 presents the IV estimates of the impact of term-time working on starting monthly wage. The models are estimated with the 2SLS estimation. The first-stage coefficients, Kleibergen-Paap Wald rk F-statistics, p-values of the Anderson-Rubin weak-instrument robust test, and p-values of the Wu-Hausman test are reported at the bottom of the table. As shown in the table, the coefficients on all the four measures of term-time working are not statistically significant. The insignificance of the impacts of the participation and length of term-time working is consistent with the OLS and PSM estimates. However, the OLS estimates presented in Table 6.3 suggest that the length and total amount of term-time working are statistically significantly associated starting monthly wage; while the IV estimates for these two measures are insignificant, though the direction of the impacts is positive and the magnitudes are larger than the OLS estimates. As shown by the F-statistics, the instrument is very weak in the models of the length and total amount of term-time working. Therefore the larger but insignificant IV estimates may just be noisy, as the standard errors are inflated by the weak correlation between the instrument variable and the treatment. Yet the Anderson-Rubin weak-instrument robust tests (AR test) show that the coefficients of length and total amount are not statistically significantly different from zero, indicating that there is no significant impact of length and total amount of term-time working on starting salary. Actually the significant OLS estimates are not robust as well. As discussed previously, the significance of the estimates is driven by the outliers with extreme values in length and total amount of term-time working. When the outliers are removed from the analytic sample, the estimates become insignificant. This suggests that term-time working is in general not correlated with starting salary.

Table 6.10 IV estimates of the impact of term-time working on starting salary (Dependent variables: whether being offered a job before graduation)

	(1) Participation	(2) Length	(3) Intensity	(4) Total amount
Ever worked during term time	0.238			
	(0.252)			
Total months worked during term time		0.0269		
		(0.0320)		
Average hours worked per week during term time			0.00357	
			(0.00681)	
Accumulated full-time equivalent working days during term time				0.00163
				(0.00291)
Ever worked in vacations	-0.00487	0.00365	-0.00472	-0.000992
	(0.0198)	(0.0207)	(0.0267)	(0.0199)
Age	0.128***	0.152**	0.110***	0.126*
	(0.0296)	(0.0483)	(0.0332)	(0.0574)
Female	0.00372	-0.00699	0.00946	-0.00185

	(0.0101)	(0.0151)	(0.00944)	(0.0150)
Minority	-0.110***	-0.124*	-0.0994***	-0.115*
	(0.0302)	(0.0532)	(0.0276)	(0.0538)
Single child	0.0433	0.0244	0.0253	0.000743
	(0.0528)	(0.0499)	(0.0589)	(0.0539)
From rural area	0.0330	0.0130	0.0340	0.0196
	(0.0327)	(0.0303)	(0.0279)	(0.0328)
SES score	-0.0325	-0.0485	-0.0284	-0.0396
	(0.0266)	(0.0297)	(0.0268)	(0.0286)
Student leader in senior high school	0.0266	0.0268	0.0185	0.0274
	(0.0178)	(0.0192)	(0.0131)	(0.0212)
Humanity track in high school	-0.00478	-0.000658	-0.0327	-0.0320
	(0.0385)	(0.0364)	(0.0358)	(0.0438)
Arts or athlete student in high school	-0.110**	-0.112**	-0.156***	-0.158***
	(0.0374)	(0.0390)	(0.0385)	(0.0418)
NCEE score (rescaled to 1~100)	0.0233	0.00417	0.0316	0.0103
	(0.0259)	(0.0360)	(0.0234)	(0.0342)
Average course score	-0.0501	-0.00675	-0.0476	-0.0189
	(0.0348)	(0.0381)	(0.0390)	(0.0337)
Science or Engineering major	0.00322	0.00486	-0.00417	0.00352
	(0.0673)	(0.0646)	(0.0713)	(0.0707)
Economics or Management major	0.00885***	0.00704***	0.00799**	0.00807**
	(0.00247)	(0.00184)	(0.00248)	(0.00274)
Have a minor	0.000503	-0.000499	0.000311	0.000647
	(0.00201)	(0.00183)	(0.00283)	(0.00267)
Preference degree of one's major	-0.0206	-0.0229	-0.0484	-0.0430
	(0.0372)	(0.0392)	(0.0440)	(0.0421)
Pass CET-6	0.0242*	0.0203+	0.0179	0.0188
	(0.0120)	(0.0123)	(0.0118)	(0.0119)
Pass CET-4	0.135***	0.142***	0.139***	0.136***
	(0.0319)	(0.0336)	(0.0319)	(0.0321)
Student leader	0.0593*	0.0486+	0.0733**	0.0705**
	(0.0270)	(0.0266)	(0.0261)	(0.0256)
CCP member	0.0386	0.0379	0.0469+	0.0519+
	(0.0243)	(0.0245)	(0.0242)	(0.0291)
Have professional certificates	0.0421	0.0341	0.0365	0.0390
	(0.0268)	(0.0225)	(0.0285)	(0.0290)
Have merit-based aid	-0.0281	-0.0338	-0.0181	-0.0266
	(0.0202)	(0.0284)	(0.0207)	(0.0379)
Have need-based aid	0.0265	0.0204	0.0378	0.0271
	(0.0250)	(0.0308)	(0.0246)	(0.0360)
Have loan	-0.0465+	-0.0768	-0.0463*	-0.0624
	(0.0249)	(0.0599)	(0.0208)	(0.0439)
% of low-SES students in the institution	-0.0429+	-0.0617	-0.0248	-0.0379
	(0.0242)	(0.0468)	(0.0228)	(0.0312)
Comprehensive institutions	-0.00780	-0.142	-0.0539	-0.128

	(0.156)	(0.208)	(0.175)	(0.193)
Engineering-concentrated institutions	0.0961*	0.0660	0.0928*	0.0746+
	(0.0409)	(0.0461)	(0.0415)	(0.0432)
"985" institution	0.0600+	0.0637	0.0450	0.0620
	(0.0325)	(0.0420)	(0.0308)	(0.0498)
"211" institution	0.132***	0.160***	0.143***	0.171***
	(0.0398)	(0.0432)	(0.0402)	(0.0479)
Independent college	0.126***	0.122***	0.134***	0.130***
	(0.0217)	(0.0285)	(0.0219)	(0.0255)
Institution located in central or west area	-0.0340	-0.0434	-0.0668	-0.0454
	(0.0651)	(0.0717)	(0.0580)	(0.0822)
Migrant to work	0.0254	0.0467	0.0321	0.0448
	(0.0341)	(0.0451)	(0.0329)	(0.0328)
Constant	6.511***	7.118***	6.568***	6.839***
	(0.456)	(0.414)	(0.494)	(0.318)
N	2,955	2,852	2,695	2,643
R-squared	0.291	0.260	0.329	0.311
Adj. R-squared	0.265	0.232	0.302	0.283
IV first-stage regression outputs				
Endogenous variable	**Participation**	**Length**	**Intensity**	**Total amount**
Percent of term-time working students	0.00424**	0.0342*	0.151**	0..363+
	(0.00131)	(0.0170)	(0.0542)	(0.206)
N	2,955	2,852	2,695	2,643
R-sq	0.225	0.211	0.190	0.183
Wu-Hausman F-stat p-value	0.221	0.395	0.526	0.604
Kleibergen-Paap Wald rk F-stat	10.49	4.04	8.12	3.12
Anderson-Rubin Chi-sq p-value	0.228	0.301	0.493	0.485

Notes: 1. Sampling weights are applied and robust standard errors are in parentheses.
2. Industry, employer type, province of workplace, and missing dummies are included.
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Overall, the IV estimates find a statistically significant and positive impact of term-time working on initial employment status, but no significant impact on starting salary. This finding is consistent with the basic model and PSM estimations. The magnitudes of the IV estimates on the impact on initial employment status are much larger than the probit estimates. On one hand, it suggests that the positive impact of term-time tends to be underestimated by the naïve probit regression. On the other hand, it also suggests the existence of heterogeneous effect, as the IV estimates reveal only the local average treatment effects for those whose term-time working behavior is influenced by the IV. As discussed in Section 5.1.3.1, this group of students may be different from other students who have a clear intention of working or not working in term time. They may be less motivated and more passive in college activities. Therefore they may have fewer opportunities than other students to develop their career-related skills. Working during college might be the only experience that contributes to their labor-market competitiveness. By contrast, students who are more motivated are also more likely to participate in other career-related activities. For them, the contribution of term-time working may be less significant. Therefore the large IV estimates may suggest that less motivated students would benefit more from working in term time.

Validity tests

As discussed before, a valid instrumental variable needs to satisfy three conditions: the correlation requirement, the conditional independence assumption, and the exclusion restriction (Angrist & Pischke, 2009, p.117,152–153). The first requirement has been addressed in the previous section. This section presents some tests of the second and third requirements.

The major threat to the conditional independence assumption is that the percentage of term-time working students in an institution may be correlated with potential term-time working status and potential labor market outcomes of individual students, after controlling for the covariates. As discussed in Section 5.1.3.2, the percentage of term-time working students is arguably uncorrelated with individual's potential term-time working status, as it is exogenous to students' college choice decision in China. However, it may still be correlated with potential labor market outcomes through other ways. A very plausible way is through the institutional reputation in the labor market. As more students from the same institution taking part-time jobs or internships outside the campus, employers have more opportunities to learn about the overall ability of students in the institution. Such an institutional reputation among employers may influence the labor market outcomes of individual students. In this case, the instrument variable may be endogenous to the potential labor market outcomes. It may influence students' labor market outcomes through ways other than term-time working. Both the conditional independence assumption and the exclusion restriction may be violated.

To test whether the hypothesized situation exists, the average labor market performance of graduates in each institution is regressed against the instrumental variable and other institutional level characteristics. The average labor market performance is measured by the percentage of students who are offered a job before graduation, average number of job offers obtained, average number of interview invitations obtained, and average starting monthly wage of the best offers. The percentage of students who are offered a job before graduation measures the overall employment rate of the institution, the average number of offers and interview invitations measure the popularity of graduates from the institution among different employers, and the average wage offered measures the overall quality of job offers obtained by students. These institutional level outcomes are very likely to be influenced by the reputation of the institution in the labor market. The statistics are calculated with the whole sample but not the "Intention-to-Work" sample. The reason of doing so is that, if the percentage of term-time working students has an impact on the potential labor market outcomes through institutional reputation, the impact should be the same for all graduates but not only for those with an intention to work. The institutional characteristics included in the models are the academic ranking level, concentration, and location of the institution, average NCEE score, average tuition, the percentage of low-SES students, the percentage of students who passed the CET-6 test, the percentage of students with intention to work after graduation, and the average number of submitted resumes. The OLS regression results are presented in Table 6.11. The sampling weight is applied and the standard errors are clustered at the institution level.

Table 6.11 Influence of IV on institutional labor market outcomes

	(1)	(2)	(3)	(4)
Dependent variable:	**% of students with offer**	**Ave. No. of offers**	**Ave. wage**	**Ave. No. of interviews**
% of term-time working students (IV)	0.0752	0.254	60.17	1.045
	(0.115)	(0.407)	(396.4)	(0.786)
% of students with an intention to work after graduation	0.792***	2.141***	-547.8	-1.120+
	(0.149)	(0.353)	(328.1)	(0.645)
% of low-SES students	0.461*	1.238+	-291.6	1.650*
	(0.219)	(0.711)	(519.6)	(0.816)
Average tuition	3.63E-06	2.82E-05	-0.0197	1.54E-04***
	(7.64E-06)	(2.51E-05)	(0.0145)	(4.31E-04)
Average NCEE score	8.64E-04	0.00822***	-0.975	0.00545
	(5.74E-04)	(0.00219)	(2.833)	(0.00453)
% of students passed CET-6	0.00427	-0.623	1951.4***	0.176
	(0.122)	(0.459)	(404.7)	(0.741)
Average No. of job applications	0.00329	0.0241*	-9.153	0.113***
	(0.00299)	(0.0116)	(10.25)	(0.0169)
"985" institution	0.0387	0.305*	129.1	-0.125
	(0.0464)	(0.126)	(214.5)	(0.267)
"211" institution	-0.0199	0.0873	-34.04	-0.117
	(0.0316)	(0.148)	(131.9)	(0.241)
Independent college	-0.0535	-0.0721	277.3*	-0.555*
	(0.0373)	(0.140)	(109.8)	(0.246)
Comprehensive institutions	0.0921*	0.0712	374.9***	-0.221
	(0.0408)	(0.0969)	(82.01)	(0.164)
Engineering-concentrated institutions	0.178***	0.214+	318.3**	-0.0724
	(0.0325)	(0.126)	(93.25)	(0.254)
Institution located in municipalities	0.0199	0.379+	254.2	-0.310
	(0.0484)	(0.206)	(151.6)	(0.350)
Institution located in	-0.0220	-0.0312	81.57	0.497***

central or west area	(0.0268)	(0.108)	(85.80)	(0.139)
Institution locates in small cities	-0.0524+	0.0926	-69.40	-0.288
	(0.0309)	(0.108)	(91.57)	(0.192)
Constant	-0.857*	-5.492***	2725.5*	-1.977
	(0.324)	(1.139)	(1311.5)	(2.480)
N	6,977	6,977	6,974	6,977
R-sq	0.847	0.725	0.862	0.687
adj. R-sq	0.847	0.724	0.862	0.686

Notes: 1. Sampling weights are applied and standard errors in paraphrases are clustered at the institutional level;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

As shown in the table, the R-squareds are high in all the models, indicating that variables included in the models are able to explain the majority of the variations in the average labor market performance across institutions. The coefficients on the instrumental variable in all four models are not statistically significant, suggesting that the percentage of term-time working students does not influence institutional reputation in the labor market. This is understandable, as the reputation of an institution is more likely to be built upon its alumni in the past cohorts, who already work fulltime in the labor market for years. Students who are still enrolled in college may contribute little to the reputation of the institution. Overall, the falsification tests provide some evidence to boost the confidence of the validity of the instrumental variable.

In summary, the analysis with quasi-experimental strategies reveals a statistically significant and positive impact of term-time working on the probability of being offered a job by graduation, but no impact on the starting salary. This finding is consistent with the basic model analysis. The quasi-experimental estimates also suggest that the basic model estimates tend to be downward biased. In addition, the impact of term-time working on labor market outcomes might be heterogeneous by elite and non-elite institutions and by students' ability and motivations.

6.1.4 Impact of different forms of term-time job

The impact of term-time working on labor market outcomes may be different for different forms of job. As indicated in Scott-Clayton's (2007) modified human capital model, the quality of working experience gained in college is important for the accumulated work-related human capital. Low-skilled jobs may not be as valuable as high-skilled jobs, and jobs that are relevant to students' academic majors may be more helpful than irrelevant jobs. As discussed in Chapter 4, the work-study jobs are more likely to be service-type low-skilled jobs such as sales, cleaners, and librarians. The part-time jobs are more likely to be short-term and temporary jobs that are irrelevant to students' academic majors. Therefore these two forms of working experience may have limited contributions to students' work-related human capital. The internships are more likely to be academic- and career-related jobs, and therefore may be more beneficial to students' labor market outcomes.

There is some evidence to this hypothesis from previous Chinese studies (Qing, 2012; Qing & Zeng, 2009; Ren, Guo, & Pan, 2013). Qing (2012) and Qing and Zeng (2009) found that internships that relevant to one's academic major has a statistically significant and positive association with the initial employment status. Ren, Guo, and Pan (2013) found that taking two and above pieces of internships statistically significantly increases the probability of being employed after graduation, while taking part-time jobs has no statistically significant impact.

This section examines the impact of taking work-study jobs, part-time jobs, and internships during term time on labor market outcomes. The basic models and IV strategies are used in the analysis. Each form of term-time working experience is measured with three variables: the participation, length, and intensity. The instrumental variable used for each form of job is the percentage of students taking the corresponding form of job in the institution. Similar as Section 5.1.4.1, the analysis is first done with the full sample. Three variables measuring the same aspect of each form of job are included simultaneously in the same model. Then a robustness check is done with the subsamples in which students took only one form of job in term time.

Table 6.12 presents the full sample estimates of the impact of different forms of job on initial employment status. Only the basic probit estimates are reported, as the *ivprobit* estimations with three endogenous variables fail to converge. Column 1 shows the impact of participation in different forms of job, Column 2 breaks the participation down into more categories to take into account the number of job forms taken, Columns 3 and 4 show the impact of length and intensity of different forms of job. Off-term working participation and other covariates in Equation 3.3 are controlled for in all models. According to the table, all three measures of term-time work-study jobs are not significantly associated with initial employment status. For term-time part-time jobs, the coefficients on participation and the intensity are not statistically significant. But the length of taking part-time jobs is statistically significantly associated with higher probability of being offered a job before graduation. For term-time internships, the coefficients on participation, length, and intensity are all statistically significant and positive. In addition, the magnitudes of these coefficients are larger than the magnitudes of the probit estimates of the coefficients on the participation, length, and intensity of overall term-time working experience presented in Table 6.2. As shown in Column 2, the association between internships and initial employment status remains significant and positive in combination with other forms of term-time jobs. These results suggest that the positive impact of term-time working on initial employment status mainly exerts through the impact of internships. Results in column 2 also suggest that students taking multiple forms of jobs are more likely to get employed before graduation.

Table 6.12 Impact of different forms of term-time job on initial employment status (full sample)

	(1)	(2)	(3)	(4)
	Participation		Length	Intensity
	Ever took each form	Combination of forms	Total months	Average hours in each form
Ever took work-study jobs in term time	0.0301			
	(0.0298)			
Ever took part-time jobs in term time	0.0501+			
	(0.0261)			
Ever took internships in term time	0.0833**			
	(0.0256)			
Only took work-study jobs in term time		-0.00323		
		(0.0487)		
Only took part-time jobs in term time		0.0602+		
		(0.0355)		
Only took internships in term time		0.0868**		
		(0.0324)		
Took work-study and part-time jobs in term time		0.0750		
		(0.0527)		
Took work-study jobs and internships in term time		0.117*		
		(0.0522)		
Took part-time jobs and internships in term time		0.0953*		
		(0.0376)		
Took all three forms of jobs in term time		0.169***		
		(0.0405)		
Total month of term-time work-study jobs			0.00717+	
			(0.00380)	
Total month of term-time part-time jobs			0.0127**	
			(0.00390)	

Total month of term-time internships			0.0159*	
			(0.00647)	
Average hours of term-time work-study jobs				-0.0000535
				(0.00157)
Average hours of term-time part-time jobs				0.000941
				(0.00110)
Average hours of term-time internships				0.00313***
				(0.000761)
Ever worked in vacations	0.119***	0.116***	0.111***	0.0957***
	(0.0243)	(0.0241)	(0.0250)	(0.0264)
N	4,487	4,487	4,245	3,856
R-sq/Pseudo R-sq	0.223	0.222	0.232	0.225

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$;
3. Full set of covariates is included in each model.

Table 6.13 shows the full sample analysis on the impact on starting monthly wage. Both the OLS and IV estimates are presented for each of the three measures. Off-term working participation and other covariates in Equation 3.4 are controlled for in all models. As shown in the table, the OLS estimates suggest that term-time work-study jobs do not have any statistically significant association with starting monthly wage; the participation, length, and intensity of term-time part-time jobs are all statistically significantly and positive associated with starting monthly wage; and the participation in internships is statistically significantly but negatively associated with starting monthly wage. The negative association between internship participation and starting salary is contradictory to the theoretical prediction and previous findings. However, the OLS estimates may be biased by the endogeneity problem. It is possible that students who are initially less competitive in the labor market are more likely to take internships, as they know that internships can improve their competitiveness. They do benefit from taking internships, as it increases the probability of being offered a job as shown in earlier analysis. However, as they are originally less competitive than non-working students, they may intentionally avoid more selective jobs and apply to less demanding jobs which offers lower wage. It is also possible that their starting wage would be even lower if they did not take internships. The OLS estimates may therefore underestimate the positive impact of taking internships. As shown by the IV estimates, none of the coefficients for the three forms of term-time working is statistically significant. Though the F-statistics at the bottom suggest that the instruments are weak in all the models, the AR weak-instrument robust tests indicate that the coefficients on different forms of term-time working in all the models are not jointly statistically significant. This suggests that the starting salary is not associated with any forms of term-time working.

Table 6.13 Impact of different forms of term-time job on starting salary (full sample)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Participation			**Length**		**Intensity**	
	Ever took each form		**Combination of forms**	**Total months**		**Average hours in each form**	
	OLS	**IV**	**OLS**	**OLS**	**IV**	**OLS**	**IV**
Ever took work-study jobs in term time	0.00967	0.0469					
	(0.0233)	(0.253)					
Ever took part-time jobs in term time	0.0577**	-0.0785					
	(0.0191)	(0.155)					
Ever took internships in term time	-0.0610**	0.0947					
	(0.0191)	(0.297)					
Only took work-study jobs in term time			0.0362				
			(0.0366)				
Only took part-time jobs in term time			0.0300				
			(0.0287)				
Only took internships in term time			-0.0788**				
			(0.0268)				
Took work-study and part-time jobs in term time			0.0609				
			(0.0524)				
Took work-study jobs and internships in			-0.0863+				
			(0.0506)				

term time							
Took part-time jobs and internships in term time			0.0221 (0.0324)				
Took all three forms of jobs in term time			-0.0115 (0.0334)				
Total month of term-time work-study jobs				0.00193 (0.00205)	0.0306 (0.0622)		
Total month of term-time part-time jobs				0.00772*** (0.00213)	0.00178 (0.0394)		
Total month of term-time internships				0.00168 (0.00424)	0.0189 (0.0462)		
Average hours of term-time work-study jobs						0.000584 (0.00140)	-0.0139 (0.0204)
Average hours of term-time part-time jobs						0.00226** (0.000774)	0.00598 (0.0101)
Average hours of term-time internships						-0.000753 (0.000488	0.000621 (0.00657)
Ever worked in vacations	0.00766 (0.0185)	-0.0121 (0.0328)	0.0109 (0.0184)	0.00406 (0.0187)	0.00564 (0.0462)	0.0124 (0.0198)	0.00656 (0.0270)
N	2,950	2,950	2,952	2,784	2,784	2,511	2,511
R-sq/Pseudo R-sq	0.353	0.296	0.355	0.365	0.283	0.367	0.287
IV tests							
Weak IV test F-stat for ttws		5.93			2.03		2.81
Weak IV test F-stat for ttpt		9.63			4.54		3.43
Weak IV test F-stat for ttintern		3.17			3.53		3.07
Wu-Hausman F-stat p-value		0.621			0.677		0.647
Anderson-Rubin Chi-sq p-value		0.926			0.695		0.798

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. For the IV models, three instrumental variables are used: the percentages of students who ever took work-study jobs, part-time jobs, and internships in the instituion;
4. Full set of covariates is included in each model.

The sub-sample analyses are presented in Table 6.14. Panel 1 shows the analysis with the "Work-study only" sample which consists of students who only took work-study jobs in term time, Panel 2 shows the analysis with the "Part-time only" sample, and Panel 3 shows the analysis with the "Internship only" sample. In each panel, the estimated impacts on initial employment status are presented before the estimated impacts on starting monthly wage. Both the basic model and the IV estimates are reported.

As shown in the table, in the "Work-study only" sample, the OLS estimates are insignificant in all the initial employment status models and the wage models. However, the IV estimates of the impacts on initial employment status are statistically significant but negative. The F-statistics for the weak-identification test show that the IV is weak in the models with length and intensity of term-time work-study jobs, but is not weak for the participation in work-study jobs. Though the IV estimates may not be reliable because of the weak-identification issue, it provides some evidence that only taking work-study jobs in term time might be associated with lower probability of being offered a job before graduation. The direction of the association is consistent with the probit estimates of the coefficients on the "Only taken work-study jobs" dummy as shown in Columns 2 and 4 of Table 6.12. A possible explanation is that the IV estimates reflect the local average treatment effect on students who are not self-motivated but follow other students to take work-study jobs in term time. As work-study jobs are usually only available to students from low-income families, the students affected by this instrumental variable are actually in a disadvantaged position in the labor market. Only taking low-skilled work-study jobs may not be enough to increase their competitiveness, as such working experience is in low quality. On the contrary, taking these jobs may take away the opportunities to get involved in more valuable activities in college, such as career-related extra-curricular activities. In this case, taking work-study jobs may not be beneficial but harmful to these students.

In the "Part-time only" sample, the probit and IV estimates in general suggest that taking part-time jobs in term time are statistically significantly associated with higher probability of being offered a job before graduation. The OLS estimates on the impact on starting salary also suggest statistically significant and positive associations between the starting monthly wage and the length and intensity of term-time part-time jobs. The IV estimates, however, are not statistically significant, and the AR weak-instrument robust tests confirm that there is no significant impact of taking part-time jobs on starting monthly wage. The findings are consistent with the full sample analysis.

In the "Internship only" sample, both the probit and IV estimates suggest statistically significant and positive impact of all measures on initial employment status. The IV is strong in all three models. The magnitudes of both the probit and IV estimates are larger than the estimates on the impact of overall term-time working experience. As for the impact on starting salary, the OLS estimates reveal some significant but negative association for participation and intensity of term-time internships, but the IV estimates and the AR weak-instrument robust tests suggest that the impact is not statistically significant. These results are all consistent with the full sample analysis.

Overall, the full sample and sub-sample analyses reveal that different forms of term-time working have different impact on initial employment status. Term-time work-study jobs tend to be negatively associated with the probability of being offered a job before graduation, while part-time jobs and internships are statistically significantly and positive associated with the probability. Internships have the largest impact on the probability of being offered a job among the three forms, even larger than the pooled estimate of the overall term-time working experience. For the staring monthly wage, the IV analysis shows that it is not statistically significantly associated with any of the three forms of term-time jobs, though the OLS estimations suggest some positive associations with taking part-time jobs and some negative associations with taking internships.

Table 6.14 Impact of different forms of term-time job on labor market outcomes (subgroups)

Dependent variable	Endogenous variable	Main results: OLS/probit	Main results: IV 2nd-stage	IV 1st-stage output: coef. of IV	IV 1st-stage output: Weak-IV tests		Model fit	N	R-sq
(1) Work-study jobs (IV: % of students taking work-study jobs)									
Initial employment status (marginal effects reported)	Participation	0.0342	-0.438**	0.00779***	K-P Wald rk F-stat	13.40	**Probit**	1,632	0.289
		(0.0555)	(0.169)	(0.00209)	Wald test of exogeniety p-value	0.0371	**IV**	1,632	-
	Length	0.00764	-0.0782***	0.0257	K-P Wald rk F-stat	2.47	**Probit**	1,615	0.290
		(0.00571)	(0.0202)	(0.0160)	Wald test of exogeniety p-value	0.0358	**IV**	1,615	-
	Intensity	-0.000900	-0.0279**	0.112**	K-P Wald rk F-stat	5.01	**Probit**	1,595	0.290
		(0.00266)	(0.0113)	(0.0472)	Wald test of exogeniety p-value	0.0668	**IV**	1,595	-
Starting monthly wage	Participation	0.00557	0.0464	0.0810*	K-P Wald rk F-stat	6.57	**OLS**	915	0.388
		(0.0389)	(0.371)	(0.317)	A-R Chi-sq p-value	0.941	**IV**	915	0.387
	Length	0.00250	-0.00149	0.0443+	K-P Wald rk F-stat	3.03	**OLS**	904	0.396
		(0.00256)	(0.0693)	(0.0255)	A-R Chi-sq p-value	0.947	**IV**	905	0.394
	Intensity	-0.000768	0.00213	0.988	K-P Wald rk F-stat	2.52	**OLS**	891	0.391
		(0.00288)	(0.0307)	(0.0625)	A-R Chi-sq p-value	0.986	**IV**	891	0.388
(2) Part-time jobs (IV: % of students taking part-time jobs)									
Initial employment status (marginal effects reported)	Participation	0.0930*	0.276+	0.00812***	K-P Wald rk F-stat	33.60	**Probit**	2,069	0.234
		(0.0384)	(0.148)	(0.00150)	Wald test of exogeniety p-value	0.219	**IV**	2,069	-
	Length	0.0124*	0.0473*	0.0494**	K-P Wald rk F-stat	10.98	**Probit**	1,987	0.245
		(0.00541)	(0.0255)	(0.0147)	Wald test of exogeniety p-value	0.165	**IV**	1,987	-
	Intensity	0.00322*	0.0169*	0.144**	K-P Wald rk F-stat	7.82	**Probit**	1,939	0.230
		(0.00150)	(0.00765)	(0.0508)	Wald test of exogeniety p-value	0.125	**IV**	1,939	-
Starting monthly wage	Participation	0.0436	-0.0382	0.00879***	K-P Wald rk F-stat	14.33	**OLS**	1,249	0.393
		(0.0285)	(0.200)	(0.00233)	A-R Chi-sq p-value	0.697	**IV**	1,249	0.386

	Length	0.00858***	0.00563	0.0426+	K-P Wald rk F-stat	3.17	**OLS**	1,204	0.420
		(0.00247)	(0.0420)	(0.0240)	A-R Chi-sq p-value	0.981	**IV**	1,204	0.419
	Intensity	0.00262*	0.000693	0.189**	K-P Wald rk F-stat	8.8	**OLS**	1,163	0.407
		(0.00108)	(0.00913)	(0.0640)	A-R Chi-sq p-value	0.968	**IV**	1,163	0.403
				(3) Internships (IV: % of students taking internships)					
Initial employment status (marginal effects reported)	Participation	0.120***	0.475***	0..00653***	K-P Wald rk F-stat	17.35	**Probit**	2,243	0.235
		(0.0363)	(0.0860)	(0.00155)	Wald test of exogeniety p-value	0.0085	**IV**	2,243	-
	Length	0.0207*	0.0957***	0.0374***	K-P Wald rk F-stat	33.09	**Probit**	2,223	0.241
		(0.00886)	(0.0249)	(0.00643)	Wald test of exogeniety p-value	0.0059	**IV**	2,223	-
	Intensity	0.00427***	0.0133***	0..224***	K-P Wald rk F-stat	15.12	**Probit**	2,115	0.250
		(0.000997)	(0.00264)	(0.0570)	Wald test of exogeniety p-value	0.0138	**IV**	2,115	-
Starting monthly wage	Participation	-0.0697**	0.0969	0.00526*	K-P Wald rk F-stat	6.26	**OLS**	1,349	0.416
		(0.0251)	(0.286)	(0.00227)	A-R Chi-sq p-value	0.736	**IV**	1,349	0.385
	Length	-0.00380	0.0132	0.0277**	K-P Wald rk F-stat	8.80	**OLS**	1,340	0.408
		(0.00648)	(0.0552)	(0.00958)	A-R Chi-sq p-value	0.812	**IV**	1,340	0.403
	Intensity	-0.00174**	-0.00381	0.178+	K-P Wald rk F-stat	4.38	**OLS**	1,274	0.412
		(0.000651)	(0.00790)	(0.0986)	A-R Chi-sq p-value	0.711	**IV**	1,274	0.405

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. Full set of covariates is included in each model;
4. In probit models, the pseudo R-squareds are reported

6.1.5 Robustness check: the sample selection bias

In addition to the endogeneity problems discussed and addressed above, there is a sample selection problem in the estimation of the impact on starting salary. In the CSLM 2011 data, the starting monthly wage is only available for students who were offered a job offer by the time of the survey. Therefore those who failed to get an offer are not included in the "Have wage" sample. There might be some systematic differences between students in and outside the sample. For instance, failing to find a job before graduation may indicate lower ability. Therefore these students may end up with a lower initial salary even after they find a job. Excluding them may result in a biased estimation on the impact of term-time working on starting salary.

This sample selection bias problem is tested with the Heckman correction technique (Heckman, 1976, 1979). The technique requires the use of an exclusive variable that is correlated with the probability of observing a positive outcome, but not correlated with the potential value of the outcome through other ways after controlling for the covariates. A two-stage procedure is implemented. In the first stage, whether the outcome is being observed is estimated with the exclusive variable in a probit model. Then an Inverse Mill's Ratio (IMR) is calculated based on the linear prediction of the probability of observing a positive outcome. The IMR is then added to the second stage equation, i.e. the outcome equation. A statistically significant coefficient on the IMR indicates the existence of the sample selection bias.

In the analysis here, the outcome variable is college graduates' starting monthly wage. The dependent variable in the first stage is whether being offered a job before graduation, as the wage can only be observed for those who are offered a job. Two variables are used as the exclusive variables to test the sample selection problem. The first is the number of submitted job applications. As shown in Table 6.2, the number of submitted job applications is statistically significantly and positively associated with the probability of being offered a job. Potentially, it may also have an influence on the starting wage. Students who submit more job applications might be able to get more job offers, from which they would be able to select a job with higher wage. Yet, the wage of an offer is mainly decided by the nature of the job, such as industry, position, and location of workplace. When this information is controlled for, the number of job applications submitted by individual students has no other way to influence the wage. In other words, the only path for the number of submitted job applications to influence individual's starting salary is through its impact on whether can get the desirable offer. Therefore the exclusive condition is satisfied. When added to the wage equation, the coefficient on this variable is not statistically significant. This verifies that the number of submitted job applications has no direct impact on college graduates' starting salary.

The second exclusive variable is whether the institution is located in a small city. Presumably, small cities have fewer job opportunities than large cities. Therefore students attending institutions in small cities face more difficulties in job searching than students in large cities. For instance, there may be fewer on-campus job fairs and less information about job openings in institutions in small cities. Students may need to travel to another city for job interviews. These difficulties increase the time and monetary cost of job searching, and therefore students in small cities are less likely to get a job offer before graduation. This hypothesis is verified by the regression results shown in Table 6.2. The coefficient on this variable in the employment status model is statistically significant and negative. Yet, for students who are able to obtain a job, the institution location would have no influence on the wage of the offer when the industry, position, and location of workplace are controlled for. When this variable is added to the wage equation, the coefficient is not statistically significant, suggesting that this variable has no direct impact on starting monthly wage.

Table 6.15 presents the Heckman test. Column 1 presents the wage model with the two exclusive variables. Both the coefficients are not statistically significant, suggesting that the exclusive condition is satisfied by both variables. Column 2 presents the basic wage model as shown in Column 3 of Table 6.4 to provide a baseline of comparison. Column 3 presents the Heckman test with the number of submitted job applications as the exclusive variable, Column 4 presents the Heckman test with whether the institution locates in small city as the exclusive variable, and Column 5 uses the two variables simultaneously. As shown in the table, none of the coefficients on the IMR is statistically significant. This result suggests that the sample selection problem is not a severe issue for the estimation of the impact on starting wage.

Table 6.15 Heckman test of sample selection bias

	(1) Wage model with exclusive variables	(2) Basic wage model	(3) Heckman with No. of job applications	(4) Heckman with Inst. in small city	(5) Heckman with both
Ever worked in term time	-0.0152	-0.0140	-0.00988	-0.0176	-0.0115
	(0.0215)	(0.0212)	(0.0214)	(0.0310)	(0.0215)
No. of job applications	-0.000156				
	(0.000340)				
Institution in small city	-0.0330				
	(0.0239)				
IMR1			0.0510		

			(0.0622)		
IMR2				-0.0250	
				(0.151)	
IMR3					0.0311
					(0.0596)
Ever worked in vocations	0.00155	0.00132	0.00903	-0.00313	0.00599
	(0.0189)	(0.0189)	(0.0207)	(0.0286)	(0.0204)
N	2,955	2,955	2,955	2,955	2,955
R-squared	0.342	0.341	0.342	0.341	0.341
adj. R-squared	0.318	0.318	0.318	0.318	0.318

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. Full set of covariates is included in each model;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

6.1.6 Summary of quantitative findings

The quantitative analysis presented in this section estimates the impact of term-time working on two early post-college labor market outcomes: the initial employment status, and the starting salary. The analysis is conducted with a subsample of students who have an intention to work after graduation. Quasi-experimental strategies including PSM and IV are applied to address the endogeneity problem. Overall, the analysis finds that term-time working has a statistically significant impact on college graduates' initial employment status, but overall no impact on starting salary.

For initial employment status, the basic model analysis with probit regressions shows that it is statistically significantly and positively associated with the overall in-college working experience. Working during both the term time and vacations are associated with higher probability of being offered a job, and the magnitude of the association is larger for off-term working than for term-time working. When off-term working participation is controlled for, the participation in term-time working is associated with an increase of 7.6 percentage points in the probability of being offered a job before graduation. One more month worked in term time is associated with a 1.03 percentage points increase in this probability, one additional hour worked per week is associated with a 0.23 percentage points increase in this probability, and one additional full-time equivalent day worked during term time is associated with a 0.15 percentage points increase in this probability. Overall, these are not large effects. However, the PSM and IV estimates suggest that the probit estimates of the basic model tend to be downward biased by the negative self-selection into term-time working with regards to labor market outcomes. As students who are initially in a disadvantaged position in the labor market are more likely to work in term time, the positive impact of term-time working tends to be underestimated by the naïve probit estimates.

Using the percentage of term-time working students in the institution as the instrumental variable, the IV estimates find larger positive impacts of term-time working on initial employment status. Participation in term-time working increases the probability of being offered a job before graduation by about 37.5 percentage points, holding other things constant. The IV estimates on the impacts of length, intensity, and total amount are also larger than the probit estimates. One additional month worked in term time increases the probability of being employed before graduation by 3.3 percentage points; one additional hour worked per week increases the probability by about 1 percentage point; and one additional full-time equivalent working day accumulated in term time increases the probability by about 0.25 percentage points. The PSM and IV estimates also provide some evidence of the heterogeneous effect of term-time working on initial employment status. Students in non-elite institutions tend to benefit more from working in term time.

For starting salary, the basic model analysis with OLS regressions reveals no significant association with the participation and intensity of term-time working, but some small and positive association with the length and total amount of term-time working experiences. However, these significant impacts are sensitive to outliers with extreme values in the length and total amount of term-time working. When the outliers are removed, the associations become insignificant. The PSM and IV estimates show that none of the measures of term-time working is significantly associated with starting salary.

Further analysis finds that different forms of term-time working have different impacts on the initial employment status. Work-study jobs tend to be negatively associated with the probability of being offered a job before graduation, while part-time jobs and internships are positive associated with the probability. The impact of internships is the largest among the three forms. This is consistent with the theoretical prediction that high-skilled jobs provide more valuable working experience to college students. As for starting salary, the OLS estimates show that taking part-time jobs during term time is positively associated with higher starting salary, while taking internships is negatively associated with starting salary. Yet, the IV analysis suggests that none of the three forms of term-time working is significantly associated with starting salary. The OLS estimates may be biased by the endogeneity problem.

Among other covariates, the basic model analysis finds that students' individual and family background, innate ability, academic performance, college activities, and institutional characteristics all influence their labor market outcomes. The initial employment status is positively associated with being male, having siblings, being a student leader in senior high school, having a science and engineering major in contrast to a humanity major, having more positive attitude towards one's major, passing CET-6 exam, having professional certificate, having need-based financial aid, having loans, lower average course score, more submitted job applications, attending "985" institutions, attending engineering-concentrated institutions, and not attending institutions in small cities. The starting monthly wage is positively associated being male, being student leaders in high school, higher NCEE score, having a humanity major in contrast to an economic and administration major, passing the CET-4 and/or CET-6 exams, attending comprehensive institutions, and attending elite institutions. These results suggest that male students, students with higher innate non-cognitive ability as measured by being a student leader in senior high school, and students from "985" institutions are in an advantaged position in the labor market. They are more likely to being offered a job, and more likely to have a higher starting salary. Besides these factors, students who face more job opportunities, such as those in science and engineering majors and in institutions in large cities, and students who have a more urgent demand of a job, such as those with higher financial needs and those with siblings, are more likely to get a job offer. Yet the starting salary for these students may not be high. Students' average course score is found to be negatively associated with the probability of being employed, and not associated with the starting salary. But students' English proficiency is significantly and positively associated with their labor market performance. This suggests that English ability is valued more than academic performance in the job market.

Findings on the impact of covariates suggest that students who are not able to get an offer by the time of survey may have lower ability or in more disadvantaged position in the labor market. These students may ends up with lower starting wage. If there is a systematical difference in the potential starting wage between students who have been offered a job by the time of the survey and those who have not, there would be a sample selection bias in the wage model. The estimated associations between starting wage and term-time working and other covariates would be biased. A robustness check is conducted with the Heckman correction technique. The second stage coefficients on the Inverse Mills Ratio built upon two exclusive variables, i.e. number of job applications submitted and whether the institution locates in a small city, are not statistically significant. This suggests that the sample selection bias is not a severe issue for this analysis.

6.2 Qualitative findings: students' explanation on the influence of term-time working on labor market performance

The quantitative analysis in this chapter reveals a positive impact of working during term time on students' labor market performance. Term-time working is significantly associated with an increase in the probability of being offered a job before graduation, though overall not associated with the starting salary. This section presents the qualitative findings on how in-college working influences students' labor market outcomes. Two caveats need to be pointed out in advance. First, unlike the quantitative analysis which can separate working experience gained in term time and in vacations, the qualitative analysis cannot distinguish the influence of term-time working from off-term working, as most interviewees worked in both periods and these working experiences as a whole influence the development of their competitiveness in the job market.[26] Second, more than half of interviewees in the qualitative sample decided to go to graduate school after college. This choice is also part of their career decision and may be influenced by in-college working. Therefore they are still included in this analysis. The analysis starts with a description of the perceived influence of in-college working on career decision and job searching in Section 6.2.1, and then discusses gains from in-college working that related to the development of students' competitiveness in the job market in Section 6.2.2.

6.2.1 Perceived influence of in-college working experience on career decisions and job-searching process

Interviewees in the sample reported two ways in which in-college working influences their labor market-related post-college outcomes. First, in-college working experience in some way shaped their post-college plan and future career plan. Second, the experience and skills learned at work helped them in the job searching process. This section summarizes the interviewees' opinions on these two aspects.

Post-college plan and career plan

10 out of 18 interviewees in the sample reported that their post-college plan and career plan were influenced by in-college working experience in some ways, no matter whether they worked after college or entered graduate school. First of all, some interviewees reported that working made them more determined with their original decisions. For instance, Mr. Ming from the "985" institution decided to work after

[26] It was difficult for the interviewees to distinguish the impact of term-time working and off-term working on their labor market outcomes.

college in late junior year. He then took an internship in the summer, which reinforced his decision of entering the job market after gradation. Mr. Hou from the "985" institution, who majored in Industrial Engineering but plan to work in a business consulting company, pointed out that his five internships strengthened his determination to find a job in the professional business service industry, as he found that this was the job and life he wanted. These students have a plan in advance, and consider in-college working as a step stone to achieve their goal. Therefore they may perceive positively about the in-college working experience.

It is also possible that in-college working experience deters students from entering the job market after graduation. For instance, Ms. Jing from the "985" institution mentioned that she was unable to decide whether to work or to apply to graduate school after college until she took some internships. She found that she did not like the feeling of working 8 hours a day without any free time. Therefore she decided to apply to graduate school, in order to avoid working fulltime too early. In this case, in college working did not contribute to Ms. Jing's preparation for the labor market, nor to her career plan. But it suggests that in-college working may hold back students who are not ready to work from entering the labor market. This may be beneficial for both the individual students and the society, if they could get better prepared in graduate school.

For more interviewees, in-college working experience provided them with an opportunity to identify a suitable career path. For instance, Ms. Xin from the "985" institution was recommended to the graduate school in the senior year. Then she took an internship and received a full-time job offer from one of her clients in Hong Kong—a pretty good job for a college graduate. But she finally decided to attend the graduate school and declined the job offer. When talking about this decision, Ms. Xin said:

> *"My internship experience makes me treasure more the life in college. Though the internship started after I had been admitted to the graduate school, it reinforced my decision of staying on campus for a longer time. I got a full-time job offer after the internship, but I declined it after two days, because I knew that there are a lot of hidden rules in this industry. In addition, the several months of internship made me feel that the society outside school is really complicated and complex. I would like to stay in the academia, and I am a person who can do academic jobs."*
>
> *—Ms. Xin from the "985" institution, majoring in English Literature*

Unlike Ms. Jing who chose to stay in school purely because not like the working style, Ms. Xin figured out what suited her better. The internship provided her with an opportunity to learn about the industry as an insider, which helped her to make the decision between the job offer and graduate school.

Ms. Meng from the "985" institution majoring in English Literature also pointed out the internships helped her to figure out what she really wanted. She took her first internship in the second semester of the freshman year, when she found the courses in school not interesting and did not know what to do and what to learn. That internship allowed her to get in touched with the outside world and find out what she wanted to learn. Then in the third year, she worked as an intern for a foreign-owned public relations company. This internship helped her figure out what she wanted as a career through this internship. She found that she did not like the working atmosphere and job content in companies, and decided to work in the academia. Therefore she applied to a graduate school in the U.S. and changed her major to Clinical Psychology.

Another interviewee, Mr. Xiao from the “985” institution also talked about the influence of in-college working experience on his choice of major in graduate school. He did not like his undergraduate major, i.e. Mechanical Engineering, at the beginning of college, but was in favor of an economics or management major because management jobs seemed to be decent and high paid. However, he gave up the opportunity to transfer to a management major and stayed with his original major when he was recommended to the graduate school. Mr. Xiao related his decision to the change in his understanding of major and jobs during the college years. He still wanted to be manager or an entrepreneur. However, he now felt the need of having the relevant industry background if he wanted to work in the industry as a manager. He thought that management major lacked the necessary technical details, but also thought that knowledge and skills in management can be easily self-taught during work. Therefore he stayed with his original engineering major in graduate school. Mr. Xiao attributed this change in understanding and preference of major to his working and social experience in college. He commented that if he had not worked in college, he would think the same way about the majors and jobs as he was in high school.

Even working experiences that are irrelevant to ones’ potential career are valuable in helping students make career-related decisions. As Ms. Guo from the “985” institution pointed out:

> *"I think internships that are relevant to your career plan might be more desirable; however, you cannot decide your career goal or plan until you try it. Therefore you cannot say the irrelevant internships are detours in your career path."*
>
> *—Ms. Guo from the "985" institution, majoring in Finance*

This opinion was supported by some interviewees from the non-key institution who did not take any career-relevant job in college. For instance, Ms. Cong only took two par-time jobs as sales and waitress for a short period in college. She found that this kind of labor-intensive jobs were toilsome and low paid. So she set up a goal to work in a company in a large city. With a belief that attending a graduate school in a large city was the first step to fulfill her goal, Ms. Cong decided not to enter the job market after failing the National Graduate School Entrance Exam, but to prepare for the exam for one more year and take it again.

Overall, the above evidence suggests that the working experience, no matter whether it is relevant to one's major, may help students to form a better plan of the future. This is because that, as summarized by Mr. Xiao from the "985" institution, students may be able to develop a better understanding of the society and their preferred industry from working, and such understanding may change their plan of their career and future life.

Job searching

There are 7 students in the interview sample who decided to work after college. All of them had been offered a job by the time of the interview, though one interviewee did not accept the offer because of family reasons. When talking about whether their in-college working experience had any influence on their job searching, 6 of the 7 interviewees reported it was very helpful in the process. The only one who did not perceive any influence was Ms. Wang, who was recommended to an internship by her professor and later got a full-time job offer from the employer of the internship.

Mr. Hou, who carefully planned his college life and took five internships to increase his competitive advantage in the job market, reported the most positive influence:

> *"I think my internship experience is the crucial (in finding a job). We were talking about these experiences most of the time in job interviews. It is especially helpful in the behavioral interviews. Had I not done so many internships, I would not have been able to perform well in these interviews."*
>
> *—Mr. Hou from the "985" institution, majoring in Industrial Engineering*

As Mr. Hou mentioned, many employers placed high emphasis on the internship experience of job candidates. Some other students also reported the same experiences. For instance, Ms. Yan from the non-key institution who was applying to sales representative jobs said that many employers asked her about her previous part-time working experience as a sales promotion person. Her experience suggests that employers may not only value formal internships, but also part-time working experiences that are relevant to the job opening.

Some interviewees also mentioned that the in-college working experience made them more skillful in job interviews. As Mr. Hou said, the skills learnt from previous internship experience helped him to perform well in the behavioral interviews. Other interviewees pointed out that the experience they learned from working helped them in the face-to-face interviews. Mr. Ming from the "985" institution said:

> *"In the interviews, I know what kind of people they are looking for because I am familiar with how the companies do business. So I know how to promote myself*

and fit myself in. I also learnt about the business etiquette from my internship, which helped me leave a good impression to the interviewers."

—Mr. Ming from the "985" institution, majoring in English

Ms. Ran from the non-key institution also expressed the same opinion. Her part-time working experience taught her about employers' expectations on new employee and therefore she catered her responses to meet such expectations in job interviews. In addition, Mr. Yong from the non-key institution mentioned that the communicational skills he learnt from in-college working helped him make effective and enjoyable conversations with the interviewers. He passed all the interviews he attended, and believed that his in-college working experience contributed a lot to this success.

Overall, according to the interviewees who had job searching experience, in-college working is a significant part of the overall college experience that attracts employers' attention. Those with more relevant working experiences may have more competitive advantage in the job market. In addition, the social experience and skills learned through in-college working may help students perform better in job interviews and increase the probability of being employed.

6.2.2 Gains and losses in in-college working

As summarized in previous section, most students with job-searching experience reported that in-college working helped them to get a job. Then some questions would be raised: why employers value in-college working experience? What outcomes of in-college working experience are valuable in the job market? Ideally, to answer these questions, one should talk with the employers and learn about their opinions. But this could be a topic of another study. Instead of interviewing employers, this analysis borrows the framework of "employability", which summarizes valuable personal competencies and characteristics in the labor market as described in Section 3.2.

As discussed in Section 3.2, according to McQuaid & Lindsay's (2005) model, term-time working may influence the "Individual Factor" of college graduates' employability, including "employability skills and attributes" and "job-seeking ability and skills". The previous section has discussed the influence of in-college working on job-searching skills. Therefore this section focuses on the influence of in-college working on individual employability skills and attributes. Specifically, it organizes interviewees' perceived gains from in-college working by the three categories in Hillage and Pollard (1998): i.e. Knowledge, Skills, and Attitudes, then places the gains into McQuaid & Lindsay's (2005) eight categorizations of employability skills and attributes. The concept of employability has been used in the Chinese literature of the employment of college graduates, but only a few studies are empirical (e.g. Ge & Tu, 2010; Y. Jiang, Zhang, & Geng, 2013). This analysis adds a piece of empirical evidence to the Chinese literature on the factors influencing college graduates' employability.

6.2.2.1 Knowledge

Many interviewees reported broadened horizon as a result of in-college working. They gained general social experience and deepened understanding about specific industries. As discussed in Section 6.2.1, such knowledge and experiences shape students' post-college and career plan to some extent.

<u>General knowledge about the society</u>

As discussed in Chapter 4, many college students work in order to gain social experience. Over half of the interviewees in the sample worked with this motivation, and all of them reported that they achieved their goal. 11 interviewees considered social experience and knowledge as their most important gain from in-college working. In general, they reported two ways through which they gained social experience at work.

The first way is directly through new experiences they engaged in at work. For instance, Mr. Hou from the “985” institution mentioned that his last internship with a foreign-owned consulting company brought him to a new world that he never experienced before. As a project assistant, he accompanied his boss to attend dinners in five-star hotels and meet high-level people from all over the world. He learnt about a new life-style from these experiences, which reinforced his commitment to the professional business service industry. On the other hand, some interviewees reported negative experience in the society. For instance, when working as a student mentor for a summer camp company, Ms. Guo from the “985” institution found that some people and private companies in the society tended to be realistic and profit-orientated, but did not really care about their customers. The other two interviewees, Ms. Xiang and Ms. Yan from the non-key institutions talked about their experiences of being bulleted at work. They said that such experiences raised their awareness of self-protection in the society. These interviewees’ experiences suggest that students may encounter with different situations and different issues at work, from which they learn about the society outside school.

The second way for students to accumulate social experience at work is through the interaction with different people. Mr. Guang from the non-key institution who took various types of jobs such as waiters, flyer distributors, private tutors, office boy (a work-study position), and intern journalist pointed out that the largest gain from these working experiences was people he met at work:

"I made a lot of friends outside the campus. Different people have different experiences. I learnt a lot (about the society) from their experiences."

—Mr. Guang from the non-key institution, majoring in Chinese Literature

Similarly, Ms. Ling also mentioned that talking with people who had difference life experience broadened her knowledge about the world outside school. Mr. Xiao from the "985" institution pointed out that the experiences of different people he met at work contributed to his understanding of management jobs in industries, which at the end influenced his choice of major in graduate school. For college students who have limited experience in the society, other people's story is a very good source of knowledge about the world. Working in college, especially working outside the campus enables them to get in touch with and learn from different people.

<u>Industry/occupation-specific knowledge</u>

Besides general social experience, many interviewees reported gains in knowledge about specific industries and occupations. This is a unique contribution of formal internships, as labor-intensive and low-skill work-study and part-time jobs cannot provide students with in-depth experience in a specific industry.

There are three sets of knowledge gains from formal internships. First, students may be able to get a deep and comprehensive understanding about the industry as an insider. For instance, Ms. Xin from the "985" institution learnt about the hidden rules in the public relationship industry during her internship. Such information is only accessible to insiders of the industry. For another example, Mr. Guang from the non-key institution gradually developed an understanding about the Cultural Media industry during his internship in a local newspaper. He was interested in this industry before, but had limited information about it. The internship allowed him to get into the field and talk with people inside the industry.

Second, students may learn occupation-specific knowledge, which could complement the knowledge from textbooks. For instance, though majoring in Finance, Ms. Guo from the “985” institution said that she was not interest in the finance industry until she took her first internship in a venture company. Though her job as an intern was not intensive, she learnt a lot practical knowledge by attending weekly meetings and discussing with co-workers. After the internship, she started to actively accumulate practical knowledge of finance outside class. Similarly, Mr. Hou from the “985” institution pointed out that he learnt many finance terminologies and models in his first internship with a commercial bank. As a non-finance major student, this was his first contact with the finance industry.

Third, students are able to learn about business operation of firms and companies in the real world. For instance, Mr. Hou from the “985” institution mentioned that his internships in a commercial bank and two consulting companies offered him plenty of opportunities to learn about the operation of different types of firms and companies. In his last internship, when he accompanied his boss to meet the top managers of different companies, he was able to learn about their experience and lessons in managing and supervising their business. These were valuable knowledge for Mr. Hou who intended to work in the professional service industry.

Overall, the above evidence shows that in-college working experience contributes to students' general social experience as well industry/occupation specified practical knowledge. According to Hillage and Pollard (1998), this is the first set of employability assets owned by individual. McQuaid and Lindsay (2005) placed these aspects under the "Work knowledge base" category. This suggests that in-college working may influence students' employability by strengthening their work knowledge base.

6.2.2.2 Skills

Skills are a large category of employability assets. McQuaid and Lindsay (2005) identified three categories of skills: the Basic Transferable Skills such as basic skills such as writing and oral presentation; the Key Transferable Skills such as reasoning, problem solving, team working, time management, basic interpersonal and communication skills, and etc.; and High Level Transferable skills such as business thinking, commercial awareness, vision, job-specific skills, and enterprise skills. Students can learn and practice many of these skills in their in-college working experience. More specifically, interviewees in the qualitative sample reported improvement in the following skills: interpersonal and communication skills (12/18), job-specific skills (5/18), thinking skills (3/18), conflict solving skills (3/18), and team working skills (1/18). In addition, as presented in Chapter 5, some interviewees also reported improvement in time management skills (4/18).

<u>Interpersonal communication skills</u>

Interpersonal and communication skills are the most commonly reported gains from in-college working. Two-third of the interviewees mentioned improvement in such skills, regardless of the types of job they were taking.

The improvement was in different aspects. Some interviewees gained the courage to talk to others. For instance, Mr. Liang from the non-key institution talked about his experience as a campus sales representative of an online store. In order to promote the store to more students, he distributed flyers to other students and talked with them whenever he had the opportunities. He said:

> *"In this way, the job at least improved my ability to talk with strangers. At the beginning I was afraid to start a conversation with others. Now I have the courage to do so."*
>
> *—Mr. Liang from the non-key institution, majoring in Electronic and Information Engineering*

Mr. Guang from the non-key institution also mentioned the same point. He said he was not good at communicate with others at the beginning. However, the jobs pushed him to talk with others:

> *"I was not good at communication. But you have to say something at work when you are distributing flyers or tutoring students. In addition, just say something is not enough. You need to pay attention to how to express yourself in a more effective way."*
>
> *—Mr. Guang from the non-key institution, majoring in Chinese Literature*

Mr. Guang moved a step forward in communication skills: he not only gains the courage to speak up, but also learnt how to communicate in an effective way. Mr. Xiao from the "985" institution also pointed out that he started to pay attention to the content and context when talking with others after he started to work. Some other interviewees pointed out that they learnt how to persuade others in the sales or private tutoring jobs.

In addition to basic communication skills, some interviewees also reported improved skills to deal with interpersonal relationships. For instance, Mr. Hou mentioned the complicated office relationships in the commercial bank where he took his first formal internship:

> *"I learnt how to work under a complicated environment. I clearly felt the difference between the environment in an office and in a classroom. In an office, there are people of different ages from different backgrounds. …… The interpersonal relationships was much more complicated than the relationships between schoolmates."*
>
> *—Mr. Hou from the "985" institution, majoring in Industrial Engineering*

Mr. Hou talked about several lessons he learnt from this internship to deal with different people. He offended an arrogant lady unintentionally, and irritated his boss because he kept arguing with him. With these lessons, he gradually became more sophisticated and modest in communication with others. For another example, Ms. Guo learnt how to work with different interest groups when she works as a student mentor for a summer camp. She needed to coordinate the summer camp organizer, the students' supervisor, the travel agency, and the host school. She made some mistakes in this process, but her communication skills and coordinating skills improved a lot through the mistakes.

Overall, the interviewees' experiences suggest that the improvement in communication and interpersonal skills is the one of the largest gains from in-college working. College students have been stayed in a simply environment in school for more than 12 years. They lack of experiences to deal with different people in the society. Working outside the campus provides them with such an opportunity. According to

McQuaid and Lindsay (2005), the interpersonal and communication skills are one of the key transferable skills that contribute to ones' employability. As presented in previous section, some interviewees also reported that the communication skills they learnt from working helped them in job interviews. Therefore this can be considered as a way through which in-college working improves students' labor market performance.

Job-specific skills

Some interviewees reported gains in job-specific skills. For instance, Ms. Ran from the non-key institution majoring in International Economics learnt sales skills from her part-time job as a sales promotion person. Mr. Yong from the non-key institution who organized a summer tutor camp reported improved presentation and teaching skills. Students taking internships reported more gains in this aspect. For instance, Mr. Guang learnt how to do interviews and how to compose newspaper articles from his internship in the local newspaper. Mr. Hou, Mr. Ming, and Mr. Xiao from the "985" institution all reported gains in job specific skills. In addition, many interviewees pointed out that, practice was a better way to learn job specified skills than classroom instructions. For instance, Mr. Guang talked about using a specific skill in composing newspaper articles—the Inverted pyramid story format. He learnt about this skill in class; however, he did not remember it until his mentor asked him to re-write his first article with this format. He said:

> *"Actually my professor did mention this format in class. But you will not understand and master it until you try it out. Now I will not forget this format for the rest of my life."*
>
> *—Mr. Guang from the non-key institution, majoring in Chinese Literature*

These job-specified skills can help students to perform better in their future jobs in relevant industries. They are ranked as high-level transferable skills based on McQuaind and Lindsay's (2005) framework. Yet, some interviewees, such as Mr. Hou, did not perceive the contribution of these job-specific skills in their jobs searching process. Mr. Hou said:

> *"They (the interviewers) will not give you a computer and ask you to do some analysis in a short period in the interview."*
>
> *—Mr. Hou from the "985" institution, majoring in Industrial Engineering*

It might be true that employers will not ask about job-specific skills during the interview, but they may be able to get an approximate evaluation from the applicants' experiences and qualification. Therefore it cannot say that this kind of skills does not contribute to ones' labor market performance.

<u>Critical thinking skills</u>

Some students reported improvement in critical thinking skills. For instance, Ms. Ran who worked as a tutor for an after-school class for a year encouraged her students to ask "why" and "how" to mathematics concepts and exercise questions. She said:

> *"I think this way also helps me a lot. I started to ask "why" and "how" to the things I learnt from class and other people, but not just believed in them without thinking, as I did before."*
>
> *—Ms. Ran from the non-key institution, majoring in International Economics*

Mr. Liang started to think critically since a failure in a part-time job. He was helping a factory to recruit student workers; however, due to some communication problems, the owner of the factory changed his mind in the last minute and refused to accept the students recommended by Mr. Liang. After this event, Mr. Liang started to think twice at work:

"I will not simply believe in others' words. I need to figure out the benefit, feasibility, effort, and cost of taking the job. I no longer get into actions immediately as before when I see opportunities that seem to be beneficial."

—Mr. Liang from the non-key institution, majoring in Electronic and Information Engineering

An interviewee from the "985" institution, Mr. Xiao also reported similar gains in critical thinking skills. According to the McQuaind and Lindsay's (2005) framework, this is also a key transferable skill in one's employability assets.

<u>Problem-solving skills</u>

Interviewees also reported gains in problem-solving skills from working. They experienced unexpected problems at work, and learnt problem-solving skills by solving the problems or watching others to solve the problems. For instance, when working in a restaurant, Mr. Guang witnessed how the owner of the restaurant smoothed a conflict between a customer and a waitress. The customer was trying to bargain with the waitress, but ended up arguing with her with insulting words. The owner of the restaurant first apologized to the customer and gave him a discount, and then comforted the waitress and gave her a day off after the customer left. Mr. Guang said he was about to stand up to beat the customer when the owner came. He then realized that what the owner did was more appropriate—he did not offend the customers while protected his employee. Some other students also experienced some critical events and learnt problem-solving skills from these events. This is another key transferable skill in McQuaind and Lindsay's (2005) categorization.

In addition to above skills, some interviewees also reported improvement in other aspects. For instance, Ms. Guo from the "985" institution reported improvement in team working skills from her second internship when she was assigned to a team of four persons to work on a project. Mr. Hou from the "985" institution reported an ability to transfer between different roles in school and work cultivated during the semester when he was taking intensive internships and preparing for professional certificate exams. Also, as discussed before, some interviewees reported improved time-management skills. All these skills are key transferable skills based on McQuiand and Lindsay's (2005) categorization of employability skills. Overall, students are able to practice and improve some key skills from working in college. These skills improve their employability and competitiveness in the job market.

6.2.2.3 Attitudes

Besides knowledge and skills, students' attitudes and personalities may also be changed by their in-college working experience. The McQuaind & Lindsay's (2005) framework identifies two categories of attitudes: the Basic Social Skills such as honesty and integrity, reliability, positive attitude to work, responsibility, self-discipline, etc; and Personal Competencies including proactivity, diligence, judgment, self-motivation, initiative, assertiveness, confidence, and act autonomously. The interviewees reported gains in some of these aspects.

Some students reported improved sense of responsibility. As college students have limited working experience, they are usually assigned low-skill tasks at work, even when doing internships. These tasks are boring, but some students persisted to the end. Mr. Ming who worked as a student dorm assistant said:

> *"My only impression about the job is that it was really a boring job. I repeated the standard checklist day after day. …… But later on I found that there was still something interesting in boring jobs. For instance, I made some friends in the dorm building. …… Though it was a simple work, I felt proud after all, because I fulfilled my responsibility."*
>
> —Mr. Ming from the "985" institution, majoring in English Literature

Mr. Hou also talked about the gains from doing simple tasks in his internship with the commercial bank. He was asked to copy the contracts by hand, which seemed to be easy and boring, but not allow any mistake. Mr. Hou summarized his gains:

> *"The task made me more detail-oriented and earnest. It is a positive working attitude as well as an ability to fulfill simple tasks with no mistake. …… It increased my attention to details, as well as my tolerance level of boring tasks. …… At the beginning, I felt that I, as a student of the XXX university (the name of the "985"institution"), should be assigned more challenging tasks. But later on, I found that boring tasks are challenging as well, and I started to work earnestly."*
>
> *—Mr. Hou from the "985" institution, majoring in Industrial Engineering*

These students' experience suggests that even low-skill jobs may contribute to student development, as long as they can persist in the job and fulfill their responsibilities. Other interviewees also mentioned that they became more diligent, patient, and cooperative through working.

In addition to working attitude, some interviewees reported changes in personalities. For instance, Mr. Liang from the non-key institution said he was an impatient person and easily got irritated before. But after he started to work, he gradually become more patient and learnt to control his temper, because he found that anger could not solve any problem. Other two interviewees, Ms. Ling and Ms. Cong from the non-key institution mentioned that the working experience as sales and waitresses made them more extroverted. Overall, these attitudes and personalities are valuable components of one's employability. They may also contribute to students' post-college labor market performance.

In summary, the qualitative analysis reveals that students can accumulate knowledge, skills, and attitudes from in-college working. According to the employability framework, these assets are valued by employers in the job market. This provided an explanation of why in-college working experience may improve students' labor market performance. The analysis also reveals that students may also alter their career plan and post-college plan based on the knowledge and experience gained through in-college working. In addition, the analysis suggests that internship is the most valuable form of in-college job. It provides students with more opportunity to get in touch with the industry and more demanding tasks to practice skills. Part-time jobs may also be beneficial, as they also provide students with opportunities to see the world outside the campus. Work-study may be the least helpful form of job. No interviewees mentioned skill or experience gains from work-study jobs. This may because the work-study jobs are low-skill and on campus, which provides no new experiences to students. Yet as pointed by Mr. Ming, these simple jobs may also contribute to the cultivation of positive working attitudes, which may also be beneficial to students in the labor market.

6.3 Summary of empirical findings

Labor market outcome is one of the most important outcomes of attending college. Since 2003, the unemployment of college graduates has become an important issue in China as a result of the massification of higher education. Many college students turn to work while enrolled in order to gain competitive advantage in the job market. Previous Chinese literature shows that in-college internships contribute to student's post-college labor market performance. But no study examined the impact of working during term time, or the impact of taking other forms of jobs. In addition, no previous study explored how in-college working influence students labor market performance with in-depth empirical analysis. This chapter presents a mix-method analysis on this issue.

With a subsample of the CSLM 2011 data which consists of students with the intention to work after college, the quantitative analysis with the OLS, PSM, and IV strategies found that term-time working increases the probability of being employed before graduation, but has no influence on the starting wage of those who are offered a job. The participation, length, intensity, and total amount of term-time working experience are all significantly associated with higher probability of being employed before graduation. As for starting salary, the OLS analysis suggests some positive but small association between the length and total amount of term-time working experiences and starting salary. But the IV reveals no significant association. Further analysis shows that the significant OLS estimates are driven by the outliers with extreme values in the length and total amount of term-time working. In addition, the OLS analysis suggests that participation in off-term working is also significantly associated with higher probability of being employed before graduation, and the magnitude of the coefficient is larger than that of term-time working.

The qualitative analysis provides some supportive evidence to the quantitative findings. Most of the interviewees who entered the job market after college perceived positive contribution of their in-college working experience in the job searching process. The qualitative analysis further reveals that students are able to gain general social experience, industry/occupational specific knowledge and experience, non-cognitive and practical skills, and positive working attitudes from in-college working. These assets improve students' employability in the labor market, and therefore improve their labor market performance. In addition, some interviewees pointed out that employer paid high attention to their term-time working experience, especially in the form of internships, in job interviews. This suggests a signaling effect of term-time working in the job market. Such experience might be a signal of higher ability and productivity to the employers. But the quantitative analysis with the CSLM2011 data cannot differentiate between the signaling effect and the impact on human capital accumulation of term-time working. Yet, there is a drawback of the qualitative analysis. As the interviewees worked in both term time and vacations, it cannot distinguish the contributions of term-time and off-term working to students' labor market outcomes. In addition, the qualitative analysis does not provide any explanation of the insignificant association between term-time working and starting salary revealed in the quantitative analysis.

As for the impact of different forms of jobs, the quantitative analysis finds that work-study jobs tend to be negatively associated with the probability of being offered a job before graduation, while part-time jobs and internships are positive associated with the probability. The impact of internships is the largest among the three forms. As for starting salary, the IV analysis suggests that none of the three forms of term-time working is significantly associated with starting salary. The qualitative findings are consistent with the qualitative findings. Interviewees reported more and greater gains from internship experiences. This is because internship jobs provide them with more high quality practical opportunities. Part-time jobs also contribute to students' accumulation and development of experience and skills, and therefore are also positively influence the probability of being employed. Work-study jobs are the least valuable jobs with regards to experience and skill accumulation. The negative association between taking work-study jobs and initial employment status revealed in the quantitative analysis may be due to the opportunity cost of taking work-study jobs, as these students would not be able to participate in more valuable part-time jobs and internships.

In addition, the qualitative analysis finds that in-college working influences students' career plan, and therefore influences their post-college decisions. However, as discussed in Chapter 4, students' in-college working behavior may also be influenced by their post-college plan. This suggests that the quantitative findings with the "Intention-to-work" sample may not be generalizable to the whole sample, as it is difficult to disentangle the influences of term-time working and post-college plan on each other.

Overall, the empirical analysis presented in this chapter reveals a positive impact of in-college and term-time working on students' early post-college labor market performance. The participation in term-time working and length, intensity, and total amount of working experience are all statistically significantly associated with higher probability of being employed before graduation, though not associated with starting salary. Students are able to improve their employability skills and attributes through in-college working and therefore get more competitive advantages in the job market. Internships contribute the most to students' employability. In addition, the qualitative analysis suggests that working experience, especially internship experience might be a positive signal to the employers, and therefore increases the probability of being employed. Finally, the qualitative analysis suggests the in-college working experience may also influence students' career plan, suggesting the possibility of long-term influence on students' labor market performance.

Chapter 7 Conclusions

The massification of higher education in China since the year of 1999 raises an issue of unemployment of college graduates. Some studies found that the first unemployment rate of college graduates kept decreasing from 75.7% in the year of 2003 to 68.7% in the year of 2011 (Yue, 2012). Accompanied with the increasing pressure in the job market is an increasing percentage of working college students. Working while enrolled in college is encouraged by many higher education institutions, with a hope that the working experience could help college graduates perform better in the job market. However, some opponents point out that working during academic semesters might be harmful to students' educational achievement, and may not be able to provide students with valuable practical trainings as most of the jobs are low-skill and labor-intensive. Previous empirical studies in China provide some descriptive evidence to the debate. But there is a lack of in-depth investigation with rigorous research design on this issue.

This dissertation study examines the impact of working during academic semesters on undergraduate students' academic performance and early post-college labor market performance in China. The study employs a mixed-method research design with a nationally representative quantitative dataset collected through the CSLM 2011 survey and some qualitative data collected through interviews with working college students. Specifically, this study asks three key research questions:

RQ1: What is the current situation of student term-time working in Chinese universities and colleges?

RQ2: Does term-time working have an impact on college students' academic performance and early post-college labor market performance in China?

RQ3: What is college students' explanation on the impact of term-time working on their academic performance and early post-college labor market performance?

The first two research questions are answered with quantitative analysis, and the third research question is answered with qualitative analysis. This chapter summarizes the key empirical findings and discusses the significance, limitations, and policy implications of this study.

7.1 Summary of key findings

This section presents a summary of the key findings in this dissertation study. Section 7.1.1 answers the first research question and describes the current situation with the nationally representative dataset. Section 7.1.2 presents the quantitative findings on the impact of term-time working on college outcomes to answer the second research question. Section 7.1.3 presents the qualitative findings on students' motivation of working during term time and perceived gains and losses from term-time working to answer the third research question.

7.1.1 The current situation of term-time working in Chinese universities and colleges

With a nationally representative dataset of 6,799 students from 49 institutions, this study reveals that working during term time is now a prevalent activity among undergraduate students in four-year universities and colleges in China. This section summarizes the empirical findings to the three sub-questions of Research Question 1.

<u>RQ1.1: The incidence of term-time working in Chinese universities and colleges</u>

As shown by the CSLM 2011 data, about 62.7% of the students in the Cohort 2007 sample have term-time working experience, accounting for 80% of students who ever worked in college. The percentage of term-time working students varies across institutions. It is higher in non-key institutions than in elite institutions and independent institutions, and is higher in institutions with special academic concentrations than in comprehensive institutions and engineering-concentrated institutions. In addition, the percentage also varies by campus locations. It is higher in institutions with urban campuses than in institutions that only have suburban campuses.

RQ1.2: The characteristics of term-time working students

Students who worked in term time are different from those who did not work in term time in several ways. Basic comparison suggests that term-time working students are on average older, more likely to be female, and more likely to be from disadvantaged family and academic background than those who never worked in term time, but they are more actively involved in college activities and perform at least as well as non-term-time working students in academic works. Regression analysis shows that female students, students from rural area, and students with an academic minor are statistically significantly more likely to work during term time, while minority students, students who are the only child in their family, and CCP members are less likely to work in term time.

RQ1.3: The characteristics of term-time working experience

Students who work during term time on average work only for a short period, but take intensive workload during work. The average months worked during term time is 5.67 months, and about 33.4% of the term-time working students worked for no more than 2 months. While they are working, they worked for about 23 hours per week on average during term time. About 31.3% worked for no more than10 hours per week, and10% worked for more than 40 hours per week. The hours spent on term-time working increases while students get into senior years.

With regard to the forms of term-time jobs, the study reveals that internships and part-time jobs are more popular than work-study jobs. In the Cohort 2007 sample, 58.5% of the term-time working students took internships during term time, 56% took part-time jobs, and 31.8% took work-study positions. In addition, more than one-third of students took more than one forms of job during term time. The quantitative data also shows that students are more likely to take low-skill jobs in forms of work-study and part-time jobs in junior years, and are more likely to take high skill jobs in the form of internships when they enter senior years.

7.1.2 Quantitative findings: the impact of term-time working on college outcomes

This section summarizes the findings from the quantitative analysis on the impact of term-time working on college outcomes. It answers the four sub-questions of the Research Question 2, which is also the major research question of this study.

<u>RQ2.1: The impact of term-time working on students' academic performance</u>

The quantitative analysis with OLS, PSM, and IV strategies reveals a negative impact of term-time working on college students' academic performance as measured by average course score. Using the percentage of term-time working students in the institution as the instrumental variable, the IV estimates suggests that participation in term-time working decreases students' average course score by about 8.25 points (about 1.2 standard deviation); one more hour worked per week decreases average course score by about 0.4 points; and one more month worked during term time decreases average course score by about 0.5 points. The direction of the impact is consistent with prediction of the student involvement theory by Astin (1984). But the effect size of the IV estimate (about 0.88 standard deviation decrease in average course score for one standard deviation increase in working hours) is larger than what was found in previous U.S. studies (less than 0.2 standard deviation decrease in GPA for one standard deviation increase in working hours). Subsample analysis by elite and non-elite institution reveals that the negative impact of term-time working on academic performance tends to be more significant for students in non-elite institutions than for those in elite institutions, though the difference in the magnitude is not statistically significant. But this heterogeneous effect fades away when the IV strategy is applied. The impact is also found to vary by different forms of jobs. Taking work-study jobs in term time is not statistically significantly associated with average course score, while term-time part-time jobs and internships are found to be detrimental.

The findings of this study are contradictory to previous descriptive studies in China, which found that working in college does not influence students' academic performance. There are two possible explanations to this difference. First, previous study did not differentiate between term-time working and off-term working. Working during off-term may not influence students' academic performance as it does not occupies students' studying time. Second and more importantly, these study only described students' perceived influence of term-time working without using any statistical analytic strategies. The only econometric analysis on this issue reveals a non-linear impact of term-time working hours on academic performance (Wu, 2011). However, because of the limited access to the full-text of Wu's (2011) dissertation, this study cannot provide any explanation on the difference between the results of the two studies.

RQ2.2: The impact of term-time working on students' early post-college labor market performance

The quantitative analysis examines the impact of term-time working on two early post-college labor market outcomes: the initial employment status as measured by whether the student was offered a job before graduation, and the starting salary as measured by the starting monthly wage. The analysis is conducted with a subsample of students who have an intention to work after graduation. Overall, it finds that term-time working has a statistically significant impact on college graduates' initial employment status, but overall no impact on starting salary. Using the percentage of term-time working students in the institution as the instrumental variable, the IV estimates reveal that participation in term-time working increases the probability of being offered a job before graduation by 37.5 percentage points, holding other things constant; one additional month worked in term time increases the probability of being employed before graduation by 3.3 percentage points; one additional hour worked per week increases the probability by about 1 percentage point; and one additional full-time equivalent working day accumulated in term time increases the probability by about 0.25 percentage points. The analysis also shows that there is no statistically significant heterogeneous effect of term-time working on students' initial employment status by elite and non-elite institutions. As for starting salary, the IV estimates show that none of the measures of term-time working is significantly associated with starting salary.

The findings are in general consistent with most previous Chinese studies on the determinants of college graduates' labor market outcomes, which found significant and positive associations between taking internships and/or part-time jobs in college and the likelihood of being employed after graduation, and no significant associations with in-college working participation and starting salary. However, H.Li, et.al (2011) study using a different year data from the same data source as this study (the CSLM 2010 data) found a statistically significant but negative association between "having part-time working experience" in college and starting monthly wage. As discussed in Chapter 6, this may because the two studies used different definitions and measure of "part-time working" and different samples.

RQ2.3: The impacts of different forms of job on academic performance

The study reveals that taking different forms of job in term time has different impact on college students' academic performance. Both full-sample analysis and subsample analysis are done to examine the impacts. Pooling all forms together, the IV estimates suggest that taking internships in term time captures most of the negative impact of term-time working. Subsample analysis with the IV strategy show that taking work-study jobs in term time is not statistically significantly associated with students' average course score, but taking part-time jobs and internship are statistically significantly and negative associated with students' academic performance, and the magnitude is larger for part-time jobs than for internships. These findings suggest that the impact of term-time working on academic performance may depend on the location of workplace and content of job. On-campus jobs may not harm students' academic performance. But off-campus jobs, especially off-campus low-skill jobs may be detrimental.

RQ2.4: The impacts of different forms of job on early post-college labor market performance

The study also found that different forms of term-time job have different impacts on students' early post-college labor market outcomes. Pooling all forms together, the probit and OLS regressions suggest that taking internship in term-time is significantly associated with higher probability of being employed but lower starting monthly wage. Taking part-time jobs is not significantly associated with the initial employment status, but is statistically significantly and positively associated with starting salary. The IV estimates with the full sample were noisy. But in subsamples, the IV estimates show that taking work-study jobs in term time is significantly and negative associated with the probability of being employed, while taking part-time jobs and internships are significantly and positively associated with the initial employment status. The magnitude of the association is in general larger for internships than for part-time jobs. As for initial salary, the IV estimates with the subsamples reveal no significant impact of all three forms of jobs.

7.1.3 Qualitative findings: students' explanation on the impact of term-time working on college outcomes

The qualitative analysis in this study is based on the interviews with 18 students from two higher education institutions in China. This section summarizes the findings to answer the third research question. The summary is organized by sub-research questions.

RQ3.1: The motives of term-time working

The qualitative analysis reveals that most of the interviewees in the sample worked primarily to meet their financial need and to gain social and practical experiences. The motivation is influenced by family background and self-expectation. Interviewees from low-income families placed more emphasis on monetary compensation than those from middle class families, though their basic college costs had been covered by various types of financial aid. Interviewees with higher self-expectations were more likely to work with a motivation to gain career-related working experiences. The motivation of working during term time is also reported to change over time. Many interviewees worked for money and general social experience in the first two years in college, and for major- and career-related experienced and skills in the last two years. The analysis also reveals some other incentives of working during term time, such as to spend spare time and to follow peer students. Spare time is also found to be the constraint of participation in term-time working. Many interviewees worked only when they had time and actively adjusted the intensity of work based on their school schedule. These findings are mostly consistent with previous Chinese studies, but provide more details about students' motivation and incentives of working during term time.

RQ3.2: Explanations on the impact of term-time working on academic performances

The qualitative analysis reveals two paths through which term-time working may influence students' academic performance based on the gains and losses reported by the interviewees. The first path is time allocation and management. Most interviewees who perceived negative influence of term-time working on academic performance attributed it to the reduced time and energy for studying. Those who believed that term-time working did not influence their studying reported improved efficiency and time management skills. In addition, the analysis revealed that interviewees with higher motivation were more willing to work hard in order to balance school and work. The second path for term-time working to influence students' academic achievement is through the influence on students' motivation and attitude towards studying. Some interviewees reported that working made them more committed to studying and therefore positively influence their educational achievement.

RQ3.3: Explanations on the impact of term-time working on labor-market performances

All the interviewees who entered the job market after graduation perceived positive influence of working in college on their job searching process. According to them, the working experience was a highlight on their resume, and the skills gained in working helped them perform well in job interviews. Further analysis shows that students can accumulate general social experience, industry/occupational specific knowledge and experience, non-cognitive and practical skills, and positive working attitudes from in-college working. These gains contribute to their employability and competitiveness in the labor market. In addition, the working experience, especially internship experience, might provide a signal of higher ability and productivity to the employers. These together increase the probability of being employed. The analysis also finds that the experiences and insights gained during in-college working help students to form their career plan and adjust their post-college decision. This suggests a long-term influence of in-college working experience on students' labor market performance.

7.2 Significance

This dissertation study is one of the first rigorous empirical studies on working college students in China, and is the first study with a special focus on working during academic semesters. It provides a comprehensive analysis on the impacts of term-time working on students' academic performance and labor market outcomes in Chinese four-year universities and colleges. Specifically, it has the following significances:

First, this study focuses on a current and controversial phenomenon—working during academic semesters. Term-time working on one hand occupies students' study time, while on the other hand provides students with practical training opportunities. Therefore there is a debate among educators and educational policy makers on whether the universities and colleges should encourage students to work during term time. None of the previous studies in China explicitly differentiated between term-time working and off-term working. Thus their findings may be less informative for policies regarding term-time working students. The CSLM 2011 survey allows this study to distinguish the period during which students worked, and therefore makes it possible to examine the specific impact of term-time working on college outcomes. Also, the CSLM survey covers a national sample while previous studies were based on sub-national samples.

Second, this study employs rigorous quantitative methodologies to examine the impact of term-time working. Most previous empirical studies simply described students' perceptions about the impacts of in-college working. A few studies simply used OLS regressions to estimate the impacts. However, their estimates might be biased because the working decision is endogenous to college outcomes. This study applies quasi-experimental strategies including Propensity Score Matching and Instrumental Variable approach to address the endogeneity problem. In addition, very few previous Chinese studies on college students' labor market outcomes address the sample selection problem in the wage equation. This study deals with this problem with the Heckman correction technique.

Third, this study uses more precise measure of students' term-time working behavior. Most previous studies measured students' in-college working experience with a dummy variable to indicate participation. Only a few used the number of jobs taken or average hours worked per week to measure in-college working (Ren et al., 2013; Wu, 2011). This study measures students' term-time working behavior with participation, length (total months worked in term time), intensity (average hours worked per week in term time), and a constructed total amount of term-time working experience (total full-time equivalent working days accumulated in college). Using these measures allows for a more detailed examination on the impact of term-time working.

Fourth, this study uses qualitative analysis to complement the quantitative analysis. Some previous Chinese studies also used both survey data and interview data; however, they just superficially described students' opinions about term-time working without any in-depth investigation. This study presents a qualitative analysis with great details about students' experience and perceptions of in-college and term-time working. It provides plausible explanations to the findings in the quantitative analysis.

Fifth, this study examines the impact of three forms of term-time working: work-study jobs, part-time jobs, and internships. These forms of jobs are different in many ways and have different policy implications. But most previous studies either did not differentiate the forms, or focused only on one form of job (mostly on internships). Only one study by Ren, Guo, and Pan (2013) differentiated between part-time jobs and internships. This study is the first study that examines the impact of all three forms of jobs on college outcomes. It reveals that the different forms of jobs have different impact on students' academic performance and early post-college labor market outcomes.

Last, the study provides some evidence on the heterogeneous effect of term-time working on academic performance by types of institutions. It suggests that the academic performance of students in non-elite institutions tend to be more vulnerable to the influence of term-time working. None of the previous Chinese studies has done such sub-group analysis. As students in elite and non-elite institutions are different in many ways, the finding of heterogeneous effects of term-time working may have important policy implications.

7.3 Limitations and suggestions for future research

This section discusses the limitations of this study and provides suggestions for future research on this topic.

7.3.1 Limitations

This dissertation study has several limitations:

First, the average course score may not be a good measure of students' academic performance. As shown in Chapter 5, institutional characteristics, such as the academic ranking level and academic concentration of the institution, are statistically significantly associated with students' average course score. This suggests that the average course score may not be comparable across institutions. However, it is the best measure available to this study. As discussed in Chapter 3, previous U.S. studies used GPA as the measure of academic performance; but the scale of GPA is not consistent in Chinese universities and colleges. Some of the previous Chinese studies used academic ranking in one's class or program to measure academic performance; however, the ranking variable in the CLSM 2011 dataset seems to be subjected to serious measurement error. The average course score is the best available option for this study. The comparability is partly guaranteed by the fact that most higher education institutions in China adopt the same grading scheme under the guideline of the MoE. To make it more comparable, this study controls for as many as possible institutions characteristics, including the academic ranking level, academic concentration, location of the institution, location of the campus, and percentage of low-income students in the institution. In the models for labor market outcomes, the study includes English proficiency and whether has merit-based aid as additional measures of academic achievement. In addition, the study conducts subsample analysis by elite and non-elite institutions, with the speculation that the overall environment in these two kinds of institutions are very different but the average course score are more comparable within each subsample.

Second, the information on labor market outcomes in the quantitative analysis was collected in late May to mid-June, which was before graduation. About one-third of students in the sample had not been offered a job at that time. However, the job searching process is continued after graduation, and students are still able to get job offers after graduation. In addition, the wage provided in the job offers might be the wage for the probation period, which is usually lower than the actual wage of the job. Also, there might be some non-monetary benefits provided by the job but not included in the starting wage. Therefore the measures used in this study may not be able to fully and accurately capture students' post-college labor market performance. Information collected in six months after graduation might provide better measure of the labor market outcomes.

Third, the instrumental variable used in the quantitative analysis, the percentage of term-time working students, may be endogenous, especially with regards to labor market performance. The falsification test presented in Chapter 6 only tests one potential third way for the IV to influence students' labor market performance. However, the percentage of term-time working students may be correlated with students' labor market outcomes in other ways. For instance, the higher percent of term-time working students may indicate an institutional policy that encourages participation in practical trainings. Therefore students in that institution may attend other forms of practical training instead of term-time working and may also have better labor market outcomes than students in other institutions. In this case, the IV estimate of the impact of term-time working on labor market performance would be upward biased. A covariate used in this study, whether the student has a professional certificate, can be considered as a control for participation in practical training. However, it is not a perfect control. Students may still be able to gain practical trainings from school activities such as career development programs provided by the institution. In addition, the instrumental variable is an institutional level variable and therefore cannot control for the bias caused by institutional selection and placement of students into some job positions. If such selection is based on students' ability, the impact of term-time working on college outcomes would be upward biased. Therefore the IV estimates of the impact of term-time working on labor market outcomes need to be interpreted with some caution.

Fourth, the IV estimates only reflect the impact of term-time working on students whose term-time working decision is influenced by their peers' term-time working behaviors. As shown in the qualitative analysis, students' motivation of working influences the effort they devote to balancing working and studying. Therefore students who are affected by the IV may be more vulnerable to the negative impact of term-time working on academic performance. In addition, the qualitative analysis and previous Chinese studies suggest that only a small portion of students worked to follow their peers. Therefore the estimated LATE impacts may be only applicable to a small group of students.

Fifth, the missing data problem and measurement errors in the self-reported data may compromise the validity of the quantitative results. Though the missing data problem in the CSLM 2011 dataset is not serious overall, there are some variables that missed more than one-fifth of the observations. The "Dummy Flag" strategy is used to deal with the missing values in covariates, and observations with missing values in the outcome variables and term-time working variables are dropped from the analysis. The Multiple Imputation strategy is not used because the STATA 12 software does not provide a package to incorporate Multiple Imputation with quasi-experimental identification strategies. Besides the missing data problems, the self-reported data may also have some measurement errors. For instance, students may over report their average course score or starting wage. This may also bias the estimates of the impact of term-time working in the quantitative analysis.

Last, the qualitative sample is somewhat biased. Because of the sample recruitment process described in Chapter 3, the sample in the "985" institution is under representative of science and engineering major students. The two engineering-major students in the sample did not apply for jobs in the engineering field—one of them went to work in the business section, while the other one went to graduate school after college and also planned to work as a manger but not an engineer in the future. Engineering students may have different behavior and perceptions of term-time working; therefore the findings from the “985” institution subsample may not be generalizable to all students in “985” institutions. In addition, the non-key institution sample is over representative of student leaders, because the interviewees were recommended by their teachers. Their perceptions and feelings about term-time working may not represent the opinions of all students in non-key institutions, as they are in general more motivated students with good academic performance in the non-key institution.

7.3.2 Suggestions for future research

This study provides some preliminary findings on the impact of term-time working on students’ college outcomes in China. The findings need to be supported by further studies. Future research on this topic can be concentrated on the following aspects:

First, future studies can use student transcripts instead of self-reported data to measure students’ academic performance. The measurement would be more precise in this way. Using transcript data would also help to figure out whether working students intentionally reduce their course load or take easy courses in order to maintain a good academic record. This is one strategy used by some of the interviewees in the qualitative sample. In addition, as discussed in the previous section, the average course score may not be perfectly comparable across institutions. There might be a systematic grade inflation in some institutions, for instance in independent colleges; whereas students’ grade in some other institutions might be systematically low, for instance in engineering-concentrated institutions. Such a grade inflation or deflation may also exist at the academic major level. Checking students’ transcripts may help to reveal whether the grade in some major programs and institutions are systematically higher or lower than others, and may shed light on the way to address this issue.

Second, a longitudinal dataset that track students through and after college needs to be established to better examine the impact of term-time and in-college working experience. Ideally, students could be surveyed several times during the college years to better document their college experience, and also at some points after graduation, for instance, 6 months, one year, and three years or even longer, to provide better measurement of their labor market performance. Such a dataset also allows for the possibility to examine whether the interaction between students' academic performance and term-time working decisions is a simultaneous or sequential process.

Third, future studies can examine the impact of term-time working on other outcomes. For instance, this study uses an "Intention-to-work" sample to examine the impact on labor market performance. Yet students' intention after college is also a college outcome. As revealed in the qualitative analysis, term-time working experience may influence students' post-college plan. Future studies can use econometric methods to examine whether such an influence is a causal impact. In addition, future studies can examine the impact of term-time working on student development of cognitive and non-cognitive skills. There are some U.S. studies on this aspect, but none in China. This kind of studies could contribute to the understanding of how term-time working influences students' college outcomes.

Fourth, future studies can examine the impact of other characteristics of term-time jobs, such as whether the job is relevant to one's academic major or career plan, the demanding level of the job, the location of the workplace (e.g. distance form campus), and whether the job is taken during weekends or workdays. This could help to better understand the factors that make term-time working influential to students' college outcomes, in order to generate more relevant policies about term-time working.

Fifth, future studies can examine whether the impact of term-time working differs by students' motivation with quantitative analysis. The qualitative analysis in this study provides some evidence that students with higher motivation are less vulnerable to the negative impact of term-time working on academic performance. But quantitative analyses with representative samples are needed to examine whether this finding is generalizable.

Sixth, future studies can conduct interview with employers to learn about their expectation of new recruits as well as perceptions about student interns. This could help to further understand the impact of term-time working on students' labor market performance.

Last, future studies can examine the impact of term-time working on students in vocational short-cycle institutions. As these institutions are more practical-oriented than the four-year institutions, the experience and impact of term-time working may be different for students in these institutions than for students in this sample.

7.4 Policy implications

This study examines the impact of term-time working on college students' academic performance and labor market outcomes. It also provides some evidence of what kind of term-time working is beneficial to students. Though the findings need to be examined by future studies, they provide some implications for educational policies regarding term-time working in college.

First, the study reveals that term-time working improves students' post-college labor market performance at the cost of academic performance in college. This finding suggests that it is fair to encourage student to participate in term-time working, but more guidance should be given to their working behavior. As shown in the quantitative analysis of this study, the intensity of term-time working captures most of the negative impact of term-time working on academic performance. Therefore the institutions could set up some limitations on the maximum hours worked per week during term time, in order to help students maintain the term-time working to a moderate level. Though the quantitative analysis does not reveal non-linear impact of working intensity on students' academic performance, the qualitative analysis suggests that students who do not work intensively can use their spare time to work and therefore get free from the negative influence of term-time working on academic performance.

Second, the study finds that students' motivation may influence their gains and losses from term-time working. Those with higher motivation may benefit more from working in term time while be less vulnerable to its negative influence. This suggests that student mentors need to pay more attention to working college students to learn about their motivations of working, so that they can give better guidance and support to help the working students balance school and work.

Third, this study reveals that on-campus work-study jobs do not have negative influence on students' academic performance, but they also do not contribute to students' employability in the job market; on the other hand, internships help students to perform well in the job market, but negatively influence students' academic performance. This suggests that institutions could combine the advantages of work-study jobs and internships to provide students with better term-time working opportunities. The major advantages of work-study jobs are the on-campus workplace and light workload; while the major advantages of internships are the relevance of job content to one's academic major or career plan and the first-hand experience of working in the industries. Though the second advantage of internships is not replicable in the school setting, the institutions may consider providing more high-skill major-relevant work-study positions, so that students could gain useful practical skills by working on campus.

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APPENDICES

Appendix 1. SPSS outputs of the construction of the Index of Socio-economic Status

Table A1.1 Descriptive Statistics

	Mean	Std. Deviation	No. of obs
Log(household income) /lnfaminc	10.52	0.835	5,231
Log(residency area) /lnresarea	4.67	0.397	5,231
Mother's years of schooling /momyrsch	9.75	3.892	5,231
Father's years of schooling /dadyrsch	10.90	3.395	5,231
Residency at rural /resrural	0.46	0.499	5,231
Residency in ordinary commercial building /resordinary	0.25	0.434	5,231
One parent is manager /hous_manager	0.14	0.351	5,231
One parent is professional /hous_professional	0.17	0.374	5,231
One parent is ordinal staff /hous_ordstaff	0.16	0.364	5,231
One parent is farmer or worker /hous_farmworker	0.48	0.500	5,231
One parent works in government /hous_gov	0.10	0.297	5,231
One parent works in public institutes /hous_inst	0.19	0.389	5,231
One parent works in public service industry (edu. & medicine) /hous_pub	0.15	0.360	5,231
One parent works in service or retail industry /hous_sersale	0.25	0.431	5,231

Table A1.2 Correlation Matrix

	lnfaminc	lnresarea	dadyrsch	momyrsch	resrural	resordinary	hous_manager
lnfaminc	1						
lnresarea	0.0977*	1					
dadyrsch	0.3933*	-0.0246	1				
momyrsch	0.4008*	-0.0605*	0.6221*	1			
resrural	-0.4501*	0.1856*	-0.4621*	-0.4971*	1		
resordinary	0.3606*	-0.0998*	0.3000*	0.3393*	-0.5289*	1	
hous_manager	0.3062*	0.0242*	0.3951*	0.3546*	-0.3203*	0.2030*	1
hous_professional	0.2384*	-0.0330*	0.3326*	0.3133*	-0.2426*	0.1359*	0.1145*
hous_ordstaff	0.1446*	-0.0869*	0.1673*	0.1786*	-0.2356*	0.1305*	0.0174
hous_farmworker	-0.2969*	0.0227	-0.3074*	-0.3234*	0.3996*	-0.2441*	-0.2801*
hous_gov	0.1922*	0.0252*	0.2716*	0.2370*	-0.2083*	0.1078*	0.4607*
hous_inst	0.2250*	-0.0234	0.3384*	0.3162*	-0.2616*	0.1258*	0.3130*
hous_pub	0.2188*	-0.0173	0.3509*	0.3132*	-0.2279*	0.1173*	0.2334*

hous_servsale	0.1696*	-0.0603*	0.0544*	0.0806*	-0.2121*	0.1555*	0.0095

(Table A2 continued)

	hous_professional	hous_ordstaff	hous_farmworker	hous_gov	hous_inst	hous_pub	hous_servsale
hous_professional	1						
hous_ordstaff	-0.0076	1					
hous_farmworker	-0.2255*	-0.1859*	1				
hous_gov	0.1088*	0.1788*	-0.1798*	1			
hous_inst	0.4710*	0.1867*	-0.2182*	0.1045*	1		
hous_pub	0.5296*	0.1022*	-0.2063*	0.1323*	0.6024*	1	
hous_servsale	-0.0038	0.2477*	-0.1584*	-0.0244*	0.0496*	-0.0665*	1

a. *: $p<0.05$ b. Determinant = .019

Table A1.3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.805
Bartlett's Test of Sphericity	Approx. Chi-Square	20618.685
	Df	91
	Sig.	.000

Table A1.4 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.249	30.351	30.351	4.249	30.351	30.351
2	1.647	11.763	42.114	1.647	11.763	42.114
3	1.326	9.475	51.588	1.326	9.475	51.588
4	1.033	7.380	58.968	1.033	7.380	58.968
5	1.004	7.169	66.137	1.004	7.169	66.137
6	.780	5.574	71.711			
7	.716	5.116	76.827			
8	.643	4.593	81.420			
9	.603	4.307	85.727			
10	.558	3.984	89.711			
11	.382	2.725	92.436			
12	.375	2.679	95.115			
13	.371	2.652	97.767			
14	.313	2.233	100.000			

Extraction Method: Principal Component Analysis.

Table A1.5 Component Matrix[a]

	Component				
	1	2	3	4	5
lnfaminc	.625	-.159	.067	.067	.415
lnresarea	-.120	.244	.377	.597	.562
Mother's years of schooling	.723	-.019	.064	-.170	.049
Father's years of schooling	.729	.065	.139	-.099	.004
resrural	-.739	.333	.107	.202	-.053
resordinary	.514	-.397	-.109	-.319	.317
hous_manager	.568	-.001	.577	-.040	-.110
hous_professional	.541	.517	-.324	-.026	.088
hous_ordstaff	.307	-.396	-.210	.464	-.466
hous_farmworker	-.602	.153	.010	-.275	-.001
hous_gov	.414	-.059	.633	.093	-.365
hous_inst	.606	.439	-.261	.200	-.131
hous_pub	.582	.571	-.234	.077	-.109
hous_servsale	.168	-.565	-.357	.378	.105

Extraction Method: Principal Component Analysis

a. 5 components extracted.

Appendix 2. Correlation matrix of key variables

Table A2 Pearson correlation matrix of key variables

Panel 1. Correlation between outcomes, in-college working variables, and covariates									
	avescore	**emp**	**wage**	**worked**	**totaldr**	**avehr**	**termtime**	**ttdr**	**tthr**
avescore	1								
N	5438								
emp	-0.1947*	1							
N	5438	6977							
wage	0.0147	0	1						
N	2764	3384	3384						
worked	0.021	0.1255*	-0.0571*	1					
N	5367	6819	3356	6819					
totaldr	0.0682*	0.1003*	0.0064	0.3703*	1				
N	5127	6392	3203	6392	6392				
avehr	-0.0517*	0.1632*	-0.0668*	0.5818*	0.1404*	1			
N	4797	5986	2965	5986	5890	5986			
termtime	0.0408*	0.1091*	-0.0496*	0.8277*	0.4268*	0.4689*	1		
N	5053	6260	3150	6260	6113	5734	6260		
ttdr	0.0693*	0.0923*	-0.0047	0.3841*	0.9907*	0.1304*	0.4654*	1	
N	4898	6041	3045	6041	6019	5606	6041	6041	
tthr	-0.0410*	0.1406*	-0.0431*	0.5221*	0.1800*	0.8522*	0.6348*	0.2048*	1
N	4675	5781	2882	5781	5705	5662	5781	5667	5781
age	0.0313*	0.0222	-0.0575*	0.0714*	0.1088*	0.0068	0.0860*	0.1109*	0.0243
N	5352	6830	3343	6679	6275	5875	6153	5937	5681
female	0.2671*	-0.0906*	-0.1038*	0.1269*	0.0981*	0.1022*	0.1713*	0.1056*	0.1493*
N	5416	6945	3375	6787	6360	5954	6232	6013	5753

(Table A2. Panel 1. continued)

	avescore	emp	wage	worked	totaldr	avehr	termtime	ttdr	tthr
minority	-0.0095	-0.0095	-0.0014	-0.0356*	-0.0445*	-0.0172	-0.0435*	-0.0446*	-0.0216
N	5394	6911	3362	6755	6331	5931	6208	5989	5733
resprov	-0.0523*	0.0551*	0.0286	0.0692*	0.0699*	0.0457*	0.0640*	0.0740*	0.0507*
N	5323	6770	3321	6625	6230	5835	6103	5891	5636
resregion	-0.017	0.0446*	-0.0077	-0.0045	0.0183	-0.0273*	-0.016	0.0132	-0.0455*
N	5325	6772	3322	6627	6232	5837	6105	5893	5638
rural	-0.0202	0.1360*	-0.1127*	0.1349*	0.1265*	0.0503*	0.1490*	0.1502*	0.0554*
N	5425	6955	3379	6802	6378	5974	6247	6028	5770
singlechild	0.0032	-0.1232*	0.0738*	-0.1724*	-0.1273*	-0.0688*	-0.1825*	-0.1455*	-0.0809*
N	5388	6900	3357	6747	6327	5926	6201	5984	5729
SEI	0.0001	-0.1582*	0.0768*	-0.1302*	-0.1665*	-0.0097	-0.1576*	-0.1802*	-0.0272
N	4496	5419	2808	5339	5102	4795	5047	4891	4683
seniorleader	0.1655*	0.02	0.0556*	0.0392*	0.0956*	0.0072	0.0412*	0.0839*	-0.0021
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
NCEE	0.0243	0.0425*	0.1938*	-0.0457*	-0.0173	-0.0487*	-0.0737*	-0.0171	-0.0925*
N	4996	6136	3119	6024	5723	5374	5638	5447	5215
track	-0.0845*	0.0552*	0.0415*	-0.0714*	-0.0261*	-0.0768*	-0.0774*	-0.0378*	-0.0844*
N	5390	6893	3364	6751	6331	5929	6200	5984	5728
major	-0.0733*	0.0473*	-0.0177	-0.0454*	-0.0416*	0.0383*	-0.0700*	-0.0573*	0.0048
N	5434	6961	3383	6810	6387	5981	6255	6036	5776
likemajor	0.2450*	-0.0167	0.0381*	0.0033	0.0112	-0.017	0.0015	0.01	-0.0165
N	5354	6801	3351	6697	6296	5899	6172	5956	5702
hasminor	0.0687*	0.0009	0.0392*	0.0034	-0.022	0.0362*	0.0127	-0.0149	0.0465*
N	5361	6838	3317	6695	6292	5885	6162	5949	5687
English	0.2361*	-0.0611*	0.1782*	0.0076	0.0255*	-0.0229	0.0068	0.0226	-0.0202
N	5350	6775	3329	6648	6241	5843	6118	5906	5652

(Table A2. Panel 1. continued)

	avescore	emp	wage	worked	totaldr	avehr	termtime	ttdr	tthr
certificate	0.0568*	0.0078	-0.0094	0.0258*	0.0408*	-0.0058	0.0375*	0.0392*	0.0073
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
CCP member	0.2441*	-0.0314*	0.0405*	0.0465*	0.0963*	-0.0026	0.0463*	0.0861*	-0.0056
N	5395	6912	3359	6758	6341	5938	6211	5995	5737
stleader	0.1594*	-0.0215	0.0491*	0.0540*	0.0227	0.0103	0.0343*	0.024	0.0027
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
tuition	0.0356*	-0.0782*	-0.0071	-0.0597*	-0.0856*	0.0027	-0.0912*	-0.0883*	-0.0264*
N	5437	6972	3384	6817	6391	5985	6259	6040	5780
familyfund	-0.0192	-0.0356*	0.0561*	-0.0796*	-0.1274*	0.0147	-0.0949*	-0.1366*	-0.011
N	4678	5683	2961	5648	5400	5071	5338	5162	4946
financial aid	0.1197*	-0.0744*	0.0768*	0.0149	0.1140*	-0.0894*	0.0473*	0.1264*	-0.0616*
N	2829	3356	1688	3339	3198	2988	3175	3070	2929
hasmeritaid	0.3870*	-0.0171	0.0099	0.1275*	0.1282*	0.0538*	0.1334*	0.1342*	0.0583*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
hasneedaid	0.1125*	0.0570*	-0.0733*	0.1544*	0.1972*	0.0576*	0.1601*	0.2064*	0.0557*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
hasloan	0.0097	0.0838*	-0.0529*	0.1416*	0.1824*	0.02	0.1415*	0.1866*	0.0159
N	5350	6778	3343	6712	6302	5907	6184	5966	5712
industry	0.0516*	(n/a)	-0.0763*	0.0533*	0.0584*	0.0405*	0.0796*	0.0704*	0.0685*
N	2930	3657	3309	3620	3410	3164	3336	3227	3060
workregion	-0.0158	(n/a)	-0.1242*	-0.0073	-0.005	-0.0716*	-0.0118	-0.0002	-0.0865*
N	2782	3382	3176	3352	3209	2977	3171	3066	2903
workprov	0.0390*	(n/a)	-0.0581*	0.0356*	0.0317	-0.0241	0.0438*	0.0498*	-0.0283
N	2782	3382	3176	3352	3209	2977	3171	3066	2903
instlevel	0.0015	-0.0075	-0.2160*	-0.0136	-0.0418*	0.0078	-0.0156	-0.0368*	0.0097
N	5438	6977	3384	6819	6392	5986	6260	6041	5781

(Table A2. Panel 1. continued)

	avescore	emp	wage	worked	totaldr	avehr	termtime	ttdr	tthr
instcon	0.0621*	-0.0733*	-0.2139*	0.0685*	0.0811*	0.0208	0.1267*	0.1106*	0.0788*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
instloc	0.0950*	-0.0494*	-0.1148*	0.1198*	0.1202*	0.0716*	0.1745*	0.1341*	0.1195*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
instregion	-0.0165	0.0621*	-0.0164	-0.0367*	-0.0152	-0.0424*	-0.0516*	-0.0171	-0.0617*
N	5438	6977	3384	6819	6392	5986	6262	6041	5781
instprov	-0.0372*	0.0678*	0.0288	0.0511*	0.0713*	0.0267*	0.0501*	0.0674*	0.0284*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
% of working students	-0.0854*	0.0728*	-0.0593*	0.2296*	0.1765*	0.1911*	0.2628*	0.1892*	0.2265*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
% of term time working students	-0.0255	0.0345*	-0.0516*	0.2283*	0.2123*	0.1622*	0.2864*	0.2339*	0.2147*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781
% of low-SES students	-0.1600*	0.1676*	-0.1047*	0.0713*	0.0258*	0.0701*	0.0821*	0.0317*	0.0838*
N	5438	6977	3384	6819	6392	5986	6260	6041	5781

Panel 2. Correlation between covariates

	age	female	minority	resprov	resregion	rural	singlechild	SEI	Senior leader
age	1								
N	6830								
female	-0.0456*	1							
N	6821	6945							

(Table A2. Panel 2. continued)

	age	**female**	**minority**	**resprov**	**resregion**	**rural**	**singlechild**	**SEI**	**Senior leader**
minority	0.0163	0.0173	1						
N	6788	6901	6911						
resprov	0.0675*	-0.0626*	-0.0758*	1					
N	6661	6743	6714	6770					
resregion	0.0843*	-0.1153*	0.0561*	0.6909*	1				
N	6663	6745	6716	6770	6772				
rural	0.1306*	-0.1013*	-0.0544*	0.1447*	0.0967*	1			
N	6816	6925	6893	6755	6757	6955			
single child	-0.1308*	0.0183	0.0676*	-0.2363*	-0.1378*	-0.4670*	1		
N	6761	6868	6837	6707	6709	6882	6900		
SEI	-0.2007*	0.0982*	0.0687*	-0.1887*	-0.0967*	-0.6569*	0.5232*	1	
N	5351	5399	5380	5338	5338	5415	5386	5419	
seniorleader	0.0360*	-0.001	0.0191	-0.0296*	0.0081	-0.0569*	0.0606*	0.0392*	1
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
NCEE	-0.1094*	-0.0417*	-0.0909*	0.0382*	-0.0121	0.1059*	-0.0914*	-0.0656*	0.0183
N	6057	6117	6094	6015	6016	6124	6083	5040	6136
track	0.0184	-0.2911*	0.0105	-0.0027	0.0642*	0.0212	0.0601*	-0.019	-0.0122
N	6751	6861	6829	6694	6696	6873	6820	5375	6893
major	-0.0283*	-0.1815*	0.0091	-0.0363*	0.0038	0.0036	0.0717*	0.0317*	-0.0082
N	6815	6929	6895	6756	6758	6940	6884	5415	6961
likemajor	0.0428*	0.0458*	0.0270*	-0.0476*	0.0068	0.0098	0.0578*	0.0402*	0.0845*
N	6666	6771	6737	6614	6616	6783	6731	5338	6801
hasminor	0.0077	0.0421*	0.0252*	-0.0213	0.0018	-0.0824*	0.0824*	0.1139*	0.0437*
N	6698	6808	6775	6653	6655	6820	6775	5329	6838
English	-0.1122*	0.2259*	-0.0822*	-0.0037	-0.0684*	-0.0664*	0.0159	0.0828*	0.0278*
N	6640	6744	6711	6589	6591	6755	6706	5316	6775

(Table A2. Panel 2. continued)

	age	female	minority	resprov	resregion	rural	singlechild	SEI	Senior leader
certificate	0.0053	0.0128	-0.0113	0.0383*	0.0374*	0.0211	-0.0089	-0.0336*	0.0201
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
CCP member	0.0330*	0.1060*	-0.0523*	0.1345*	0.1148*	0.0549*	-0.0832*	-0.0413*	0.1585*
N	6784	6894	6863	6719	6721	6893	6842	5385	6912
stleader	0.0035	0.0587*	-0.0043	-0.0145	-0.0318*	-0.0905*	0.0464*	0.0953*	0.1737*
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
tuition	-0.0343*	-0.0512*	0.0455*	-0.2156*	-0.0683*	-0.2153*	0.2169*	0.2629*	0.0067
N	6825	6940	6906	6765	6767	6951	6895	5417	6972
familyfund	-0.0599*	-0.0775*	0.0059	-0.1566*	-0.0813*	-0.1512*	0.1988*	0.2556*	-0.0082
N	5594	5658	5636	5559	5560	5671	5631	4737	5683
financialaid	0.0187	-0.0136	-0.0124	0.0360*	0.0450*	0.1006*	-0.0557*	-0.1412*	0.0547*
N	3316	3349	3337	3289	3289	3350	3318	2812	3356
hasmeritaid	-0.0029	0.1741*	-0.0072	-0.007	0.0410*	0.0488*	-0.0908*	-0.0320*	0.1335*
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
hasneedaid	0.1358*	0.0427*	-0.0199	0.1427*	0.1320*	0.2190*	-0.2325*	-0.2920*	0.0417*
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
hasloan	0.1153*	-0.0761*	-0.0286*	0.1932*	0.2208*	0.2503*	-0.2822*	-0.3061*	0.0463*
N	6645	6748	6715	6594	6595	6764	6712	5332	6778
industry	0.0343*	0.2623*	-0.0103	-0.0112	-0.0892*	-0.0819*	0.0631*	0.0949*	-0.0238
N	3597	3644	3627	3566	3567	3649	3621	2937	3657
workregion	0.1005*	-0.0984*	0.0272	0.4837*	0.6051*	0.0972*	-0.1009*	-0.1074*	-0.0094
N	3346	3371	3360	3339	3340	3377	3355	2809	3382
workprov	0.0934*	-0.0911*	-0.0566*	0.6700*	0.4948*	0.1349*	-0.1866*	-0.1885*	-0.0087
N	3346	3371	3360	3339	3340	3377	3355	2809	3382
instlevel	0.1064*	-0.0167	-0.0354*	-0.0891*	-0.0597*	0.0029	-0.0303*	-0.0789*	-0.0292*
N	6830	6945	6911	6770	6772	6955	6900	5419	6977

(Table A2. Panel 2. continued)

	age	female	minority	resprov	resregion	rural	singlechild	SEI	Senior leader
instcon	0.1061*	0.1704*	-0.0298*	-0.0242*	0.0221	0.0499*	-0.0602*	-0.0963*	0.0048
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
instloc	0.1234*	0.2026*	-0.0363*	0.0058	-0.0891*	0.0929*	-0.0951*	-0.1467*	0.0191
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
instregion	0.1220*	-0.1523*	-0.0331*	0.5179*	0.6843*	0.1583*	-0.1808*	-0.1681*	0.0095
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
instprov	0.0958*	-0.0632*	-0.1119*	0.6979*	0.5033*	0.1799*	-0.2532*	-0.2251*	-0.0157
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
% of working students	-0.0072	0.1766*	-0.0645*	0.2221*	-0.0895*	0.1185*	-0.1786*	-0.1477*	-0.0547*
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
% of term time working students	0.0315*	0.1915*	-0.0706*	0.2395*	-0.0214	0.1422*	-0.1914*	-0.1764*	-0.0315*
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
% of low-SES students	0.0161	-0.0221	-0.0991*	0.3666*	0.2250*	0.3400*	-0.3370*	-0.3529*	-0.1181*
N	6830	6945	6911	6770	6772	6955	6900	5419	6977
	NCEE	**track**	**major**	**like major**	**has minor**	**English**	**certificates**	**CCP member**	**stleader**
NCEE	1								
N	6136								
track	-0.2359*	1							
N	6092	6893							
major	-0.1062*	0.4538*	1						
N	6130	6882	6961						

(Table A2. Panel 2. continued)

	NCEE	track	major	like major	has minor	English	certificates	CCP member	stleader
likemajor	-0.0707*	0.0182	-0.0351*	1					
N	6024	6730	6791	6801					
hasminor	0.0196	-0.0165	-0.0258*	0.0380*	1				
N	6037	6762	6829	6682	6838				
English	0.4120*	-0.2103*	-0.1309*	-0.0003	0.0463*	1			
N	5992	6708	6764	6637	6654	6775			
certificate	0.0059	-0.0015	0.0105	0.0126	0.0104	0.0726*	1		
N	6136	6893	6961	6801	6838	6775	6977		
CCPmember	0.0965*	-0.0352*	-0.0373*	0.0851*	0.0196	0.1496*	0.0452*	1	
N	6096	6829	6897	6741	6785	6711	6912	6912	
stleader	0.0434*	-0.0836*	-0.0576*	0.0801*	0.0601*	0.1000*	0.0372*	0.2178*	1
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
tuition	-0.4129*	0.1809*	0.1247*	0.0727*	0.0001	-0.1784*	-0.0174	-0.1373*	-0.0287*
N	6134	6890	6961	6798	6836	6772	6972	6908	6972
familyfund	-0.0965*	0.1098*	0.0824*	0.0002	0.0387*	-0.0424*	-0.001	-0.1274*	-0.0056
N	5210	5638	5680	5618	5587	5588	5683	5632	5683
financialaid	0.0456*	0.0347*	0.0241	0.0431*	0.0094	0.0481*	0.0237	0.1682*	0.0337
N	3114	3331	3354	3323	3324	3307	3356	3332	3356
hasmeritaid	0.0518*	-0.0203	-0.0199	0.0929*	-0.0059	0.2062*	0.0571*	0.3488*	0.1572*
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
hasneedaid	0.0054	-0.0239*	-0.0491*	0.0579*	-0.0680*	0.0353*	0.0296*	0.1344*	0.0326*
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
hasloan	-0.015	0.0189	-0.0246*	0.0136	-0.0067	-0.0434*	0.0201	0.0511*	0.0111
N	6017	6711	6769	6674	6665	6613	6778	6716	6778
industry	-0.1035*	-0.1123*	-0.1487*	0.0479*	0.0214	-0.0146	-0.0114	0.0454*	0.028
N	3319	3630	3651	3605	3578	3580	3657	3623	3657

(Table A2. Panel 2. continued)

	NCEE	track	major	like major	has minor	English	certificates	CCP member	stleader
workregion	-0.0752*	0.0647*	0.0169	0.0482*	-0.0117	-0.1130*	0.0256	0.0654*	0.0157
N	3139	3364	3381	3346	3316	3322	3382	3355	3382
workprov	-0.0028	0.0369*	-0.0131	0.0192	0.005	-0.0251	-0.001	0.0970*	0.013
N	3139	3364	3381	3346	3316	3322	3382	3355	3382
instlevel	-0.4960*	-0.0413*	-0.0871*	0.0128	-0.0097	-0.2580*	0.0656*	-0.1248*	-0.0434*
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
instcon	-0.2414*	-0.1361*	-0.1858*	-0.0166	-0.023	-0.1003*	0.0724*	0.0710*	-0.009
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
instloc	-0.0561*	-0.1268*	-0.1274*	0.0327*	0.0114	0.0066	0.0206	-0.0038	0.0332*
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
instregion	-0.0829*	0.0760*	0.0356*	0.0017	-0.013	-0.1012*	0.0664*	0.1609*	-0.0237*
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
instprov	0.0409*	-0.0038	-0.0078	-0.0412*	-0.0284*	0.0168	0.0433*	0.2177*	0.0115
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
% of working students	0.0321*	-0.1244*	-0.0616*	-0.0707*	-0.0998*	0.0577*	-0.0266*	0.1067*	-0.012
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
% of term time working students	0.0398*	-0.1354*	-0.0984*	-0.0508*	-0.0989*	0.0746*	-0.0094	0.1528*	0.0016
N	6136	6893	6961	6801	6838	6775	6977	6912	6977
% of low-SES students	0.1415*	-0.0726*	-0.0219	-0.0949*	-0.0689*	-0.0152	0.0143	0.0668*	-0.0616*
N	6136	6893	6961	6801	6838	6775	6977	6912	6977

(Table A2. Panel 2. continued)

	tuition	**family fund**	**Financial aid**	**hasmerit aid**	**hasneed aid**	**hasloan**	**industry**	**work region**	**workprov**
tuition	1								
N	6972								
familyfund	0.3426*	1							
N	5683	5683							
financialaid	-0.0009	-0.0995*	1						
N	3356	3030	3356						
hasmeritaid	-0.0410*	-0.0914*	0.0269	1					
N	6972	5683	3356	6977					
hasneedaid	-0.0827*	-0.2269*	0.2153*	0.1974*	1				
N	6972	5683	3356	6977	6977				
hasloan	-0.0851*	-0.2130*	0.0732*	0.0426*	0.2787*	1			
N	6775	5656	3340	6778	6778	6778			
industry	0.0038	-0.0395*	0.0024	-0.0007	-0.0112	-0.0504*	1		
N	3656	3107	1770	3657	3657	3585	3657		
workregion	-0.1084*	-0.0945*	0.0141	-0.0096	0.1380*	0.1697*	-0.0124	1	
N	3382	2976	1722	3382	3382	3341	3327	3382	
workprov	-0.1658*	-0.1325*	0.0649*	-0.0067	0.1585*	0.1592*	0.0035	0.7125*	1
N	3382	2976	1722	3382	3382	3341	3327	3382	3382
instlevel	0.2765*	0.0570*	-0.0814*	-0.0516*	-0.0432*	0.0302*	0.007	0.002	-0.0156
N	6972	5683	3356	6977	6977	6778	3657	3382	3382
instcon	-0.1327*	-0.0617*	-0.0008	0.0385*	0.0843*	0.0811*	0.1398*	0.0564*	0.0376*
N	6972	5683	3356	6977	6977	6778	3657	3382	3382
instloc	-0.2760*	-0.1318*	-0.0585*	0.0511*	0.0334*	0.0493*	0.1422*	-0.0362*	0.0198
N	6972	5683	3356	6977	6977	6778	3657	3382	3382
instregion	-0.0742*	-0.0772*	0.0221	0.0272*	0.1287*	0.2175*	-0.1237*	0.6106*	0.5231*
N	6972	5683	3356	6977	6977	6778	3657	3382	3382

(Table A2. Panel 2. continued)

	tuition	family fund	Financial aid	hasmerit aid	hasneed aid	hasloan	industry	work region	workprov
instprov	-0.2705*	-0.1817*	0.0201	0.0158	0.1263*	0.1784*	-0.0460*	0.4836*	0.6570*
N	6972	5683	3356	6977	6977	6778	3657	3382	3382
% of working students	-0.2342*	-0.2168*	-0.0186	0.0195	0.0650*	0.0253*	0.1419*	-0.0268	0.1245*
N	6972	5683	3356	6977	6977	6778	3657	3382	3382
% of term time working students	-0.3281*	-0.2332*	0.0114	0.0658*	0.1066*	0.0757*	0.1505*	0.0302	0.1617*
N	6972	5683	3356	6977	6977	6778	3657	3382	3382
% of low-SES students	-0.4641*	-0.2366*	-0.1050*	-0.0526*	0.0653*	0.1051*	-0.0506*	0.2520*	0.3399*
N	6972	5683	3356	6977	6977	6778	3657	3382	3382

	instlevel	instcon	instloc	inst region	instprov	% of working students	% of term-time working students	% of low-SES students
instlevel	1							
N	6977							
instcon	0.3019*	1						
N	6977	6977						
instloc	0.0977*	0.3038*	1					
N	6977	6977	6977					
instregion	0.0791*	0.0351*	-0.0951*	1				
N	6977	6977	6977	6977				
instprov	-0.0745*	-0.0414*	0.0353*	0.7509*	1			
N	6977	6977	6977	6977	6977			

(Table A2. Panel 2. continued)

	instlevel	instcon	instloc	inst region	instprov	% of working students	% of term-time working students	% of low-SES students
% of working students	-0.1694*	0.1075*	0.3125*	-0.1243*	0.2882*	1		
N	6977	6977	6977	6977	6977	6977		
% of term time working students	-0.1976*	0.2830*	0.3764*	-0.0392*	0.3135*	0.9355*	1	
N	6977	6977	6977	6977	6977	6977	6977	
% of low-SES students	-0.0490*	0.0983*	0.2320*	0.3441*	0.4838*	0.4327*	0.4537*	1
N	6977	6977	6977	6977	6977	6977	6977	6977

(Note: * $p<0.05$)

Appendix 3. Outputs of Propensity Score Matching analyses

Table A3.1 Estimation of the propensity score
(Dependent variable: term-time working participation)

	Whole sample (outcome: average course score)		"Intention-to-Work" sample (outcome: initial employment status)		"Have wage" sample (outcome: starting monthly wage)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Elite	non-Elite	Elite	non-Elite	Elite	non-Elite
Student leader in high school	0.163*	0.132*	0.231**	0.193**	0.142	0.169+
	(0.0672)	(0.0668)	(0.0772)	(0.0673)	(0.0972)	(0.0875)
NCEE score	-0.00727	-0.0171***	-0.00512	-0.0168**	-0.0227*	-0.0157*
	(0.00564)	(0.00497)	(0.00646)	(0.00515)	(0.00989)	(0.00723)
Humanity track in high school	-0.124	-0.0515	-0.0407	-0.142	-0.102	-0.0440
	(0.103)	(0.0928)	(0.113)	(0.0949)	(0.158)	(0.144)
Arts or athlete student in high school	0.154	-0.110	0.341	-0.0187	0.709	0.180
	(0.207)	(0.163)	(0.235)	(0.164)	(0.433)	(0.267)
Worked in high school	0.0792	-0.118	-0.0486	-0.0283	-0.0972	0.195
	(0.193)	(0.128)	(0.234)	(0.158)	(0.295)	(0.241)
Preference degree of one's major	-0.0314	0.0310	-0.133**	0.0215	-0.207***	0.0200
	(0.0416)	(0.0412)	(0.0431)	(0.0373)	(0.0553)	(0.0495)
likemajor*hadloan	-0.000172	-0.0283				
	(0.0792)	(0.0783)				
likemajor*hadminor	-0.0831	0.0683	-0.176	0.0630	0.00520	0.0984
	(0.123)	(0.118)	(0.129)	(0.129)	(0.189)	(0.210)
Hours spent per week on taking class	0.0233*	0.000403	0.00241	0.00975	0.0123	-0.00217
	(0.00952)	(0.00957)	(0.0117)	(0.00985)	(0.0152)	(0.0133)
classtime_sq	-0.000428*	-7.44E-05	8.33E-05	-0.000287	-0.000130	-7.45E-05
	(0.000184)	(0.000182)	(0.000228)	(0.000187)	(0.000300)	(0.000250)

Tuition (sticker price)	-2.31E-05+	-8.25E-07	-3.33E-05*	-9.23E-06	-3.98E-05+	-1.16E-05
	(1.40E-05)	(1.37E-05)	(1.55E-05)	(1.37E-05)	(2.39E-05)	(2.03E-05)
Household income	-5.87E-07	-4.28E-06+	3.03E-07	-2.10E-06	-1.41E-06	-1.75E-06
	(2.4E-06)	(2.35E-06)	(3.00E-06)	(2.59E-06)	(4.05E-06)	(3.40E-06)
housinc_sq	1.54e-12	1.82e-11	-4.12e-12	1.07e-11	8.64e-12	5.74e-12
	(1.20e-11)	(1.17e-11)	(1.47e-11)	(1.27e-11)	(2.12e-11)	(1.68e-11)
Amount of financial aid	3.65E-05	-4.95E-06	-7.99E-06	-1.66E-05	3.75E-05	4.18E-05
	(2.28E-05)	(2.75E-05)	(3.03E-05)	(3.30E-05)	(4.66E-05)	(4.53E-05)
finaid_sq	-1.39e-10	5.25e-10	7.29e-10	1.43e-09	3.78e-11	7.09e-11
	(1.05e-09)	(1.53e-09)	(1.27e-09)	(2.09e-09)	(1.92e-09)	(2.78e-09)
Have merit-based aid	0.0362	0.116	0.139	0.166*	0.145	0.0942
	(0.0710)	(0.0725)	(0.0878)	(0.0755)	(0.112)	(0.0963)
Have need-based aid	0.363***	0.158	0.508***	0.259*	0.486**	0.0524
	(0.105)	(0.112)	(0.127)	(0.119)	(0.171)	(0.155)
Have loan	0.146	0.209	0.0670	0.113	-0.0966	-0.0245
	(0.227)	(0.224)	(0.153)	(0.126)	(0.198)	(0.154)
hadloan * needaid	0.0842	0.379*	0.106	0.160	-0.0290	0.357+
	(0.150)	(0.161)	(0.171)	(0.165)	(0.212)	(0.206)
hadloan * hswork			-0.210	-0.0798	-0.206	-0.300
			(0.458)	(0.330)	(0.545)	(0.412)
hadloan * housincome			1.16E-06	1.50E-06	4.64E-06	2.30E-06
			(2.86E-06)	(2.50E-06)	(3.87E-06)	(3.01E-06)
hadloan * studentleader			0.130	0.176	0.140	0.252
			(0.195)	(0.170)	(0.242)	(0.213)
Age	0.195	1.038	0.462	0.982	-0.277	0.0652
	(0.714)	(0.740)	(0.625)	(0.742)	(0.470)	(0.634)
age_sq	-0.00282	-0.0211	-0.00973	-0.0204		
	(0.0154)	(0.0159)	(0.0133)	(0.0159)		
age_cube					0.000176	-2.02E-05

					(0.000287)	(0.000393)
Female	0.458***	0.268***	0.347***	0.297***	0.279**	0.289**
	(0.0655)	(0.0645)	(0.0780)	(0.0657)	(0.103)	(0.0904)
Minority	-0.0958	-0.287*	0.0488	-0.330**	0.305+	-0.381*
	(0.101)	(0.129)	(0.116)	(0.128)	(0.165)	(0.170)
From municipalities	-0.0494	0.369**	-0.212	0.145	-0.344	0.178
	(0.147)	(0.140)	(0.168)	(0.115)	(0.221)	(0.163)
From central or west area	0.0419	0.132	0.0167	0.121	0.0185	0.265*
	(0.0740)	(0.0942)	(0.0866)	(0.0946)	(0.112)	(0.128)
From rural area	0.297***	0.0900	0.203*	0.0119	0.185	-0.0520
	(0.0814)	(0.0783)	(0.0899)	(0.0783)	(0.114)	(0.102)
Single child	-0.0414	-0.269***	0.0106	-0.339***	0.0295	-0.297**
	(0.0689)	(0.0716)	(0.0808)	(0.0726)	(0.104)	(0.0988)
SES score	-0.0541	-0.0236	-0.0532	-0.0407	-0.0468	-0.0832
	(0.0453)	(0.0468)	(0.0533)	(0.0477)	(0.0699)	(0.0639)
Science or Engineering major	-0.425***	-0.286**	-0.438***	-0.298**	-0.662***	-0.339*
	(0.104)	(0.102)	(0.121)	(0.101)	(0.178)	(0.154)
Economics or Management major	-0.142	-0.162	-0.207+	-0.0795	-0.325+	-0.174
	(0.105)	(0.101)	(0.118)	(0.101)	(0.171)	(0.153)
Have a minor	0.228	0.122	0.437	0.0951	-0.0561	0.113
	(0.349)	(0.337)	(0.369)	(0.355)	(0.534)	(0.580)
CCP member	-0.0443	-0.00788	-0.0723	-0.0252	-0.145	-0.0124
	(0.0726)	(0.0787)	(0.0838)	(0.0824)	(0.106)	(0.106)
Student leader	0.222+	0.363**	0.150	0.136	0.0559	0.116
	(0.124)	(0.125)	(0.149)	(0.129)	(0.193)	(0.179)
stleader*ccp	-0.0399	-0.384**	-0.0669	-0.237	-0.0162	-0.359+
	(0.139)	(0.144)	(0.167)	(0.148)	(0.213)	(0.198)
seniorleader*stleader	-0.201	-0.0811	-0.0772	0.0201	-0.00479	0.114
	(0.139)	(0.143)	(0.168)	(0.144)	(0.211)	(0.193)
Percentage of low SES students	-0.00220	-0.00305	-0.000838	0.00234	-0.00253	0.00251

	(0.00408)	(0.00556)	(0.00494)	(0.00529)	(0.00634)	(0.00778)
Percentage of term-time working students	0.0185***	0.0177***	0.0201***	0.0151***	0.00558	0.0155**
	(0.00424)	(0.00317)	(0.00509)	(0.00319)	(0.00701)	(0.00514)
985 institutions	-0.0901		-0.0165		-0.110	
	(0.0788)		(0.0917)		(0.122)	
211 institutions						
Independent institutions		-0.168		-0.0476		0.0907
		(0.174)		(0.167)		(0.277)
Institution located in municipalities	-0.0461	-0.289+				
	(0.125)	(0.161)				
Institution located in central or west area	-0.229+	-0.378**	-0.104	-0.238*	-0.153	-0.432**
	(0.121)	(0.118)	(0.106)	(0.118)	(0.131)	(0.156)
Comprehensive institutions	0.0893	-0.0214	0.0938	-0.00972	0.489*	-0.226
	(0.116)	(0.108)	(0.145)	(0.107)	(0.209)	(0.167)
Engineering-concentrated institutions	0.107	0.00849	0.125	-0.150	0.248	-0.344*
	(0.111)	(0.103)	(0.131)	(0.102)	(0.188)	(0.167)
Campus located in suburban	-0.00216	-0.0242	-0.00756	0.0846	0.0189	0.121
	(0.0776)	(0.0744)	(0.0870)	(0.0854)	(0.114)	(0.112)
Campus located in small cities			-0.123	0.0274	-0.0603	0.0645
			(0.161)	(0.0977)	(0.217)	(0.140)
Constant	-3.076	-11.55	-5.441	-10.72	6.877	0.197
	(8.311)	(8.614)	(7.397)	(8.677)	(7.432)	(9.840)
N	2,463	2,598	1,906	2,588	1,295	1,658
Pseudo R-sq	0.123	0.128	0.137	0.131	0.138	0.141

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Missing dummies are included in all models;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

TableA3.2 PSM estimates of the impact of term-time working on academic performance
(Dependent variable: average course score)

	Whole sample			Elite institution sample			Non-elite institution sample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS w/o weights	Kernel matching	Radius caliper matching	OLS w/o weights	Kernel matching	Radius caliper matching	OLS w/o weights	Kernel matching	Radius caliper matching
Ever took work-study jobs during term time	-0.394*	-0.455*	-0.455*	-0.291	-0.240	-0.244	-0.525*	-0.581*	-0.578*
	(0.181)	(0.196)	(0.196)	(0.247)	(0.254)	(0.254)	(0.265)	(0.285)	(0.284)
Age	0.0424	0.0268	0.0242	-0.124	-0.240	-0.239	0.178	0.242+	0.237
	(0.0841)	(0.104)	(0.104)	(0.117)	(0.146)	(0.146)	(0.121)	(0.145)	(0.146)
Female	2.340***	2.207***	2.216***	2.441***	2.444***	2.450***	2.195***	1.994***	2.002***
	(0.178)	(0.219)	(0.218)	(0.247)	(0.275)	(0.275)	(0.256)	(0.318)	(0.317)
Minority	-0.546+	-0.467	-0.454	-0.441	-0.630	-0.631	-0.738	0.412	0.428
	(0.308)	(0.407)	(0.408)	(0.383)	(0.447)	(0.448)	(0.529)	(0.756)	(0.762)
From municipalities	-1.638***	-1.890***	-1.884***	-1.034+	-0.694	-0.701	-1.324*	-1.839**	-1.818**
	(0.364)	(0.420)	(0.418)	(0.593)	(0.532)	(0.531)	(0.562)	(0.600)	(0.600)
From central or west area	-0.0606	-0.133	-0.132	-0.274	-0.271	-0.275	0.163	0.183	0.180
	(0.225)	(0.249)	(0.250)	(0.282)	(0.319)	(0.319)	(0.376)	(0.394)	(0.394)
From rural area	0.381+	0.228	0.244	0.495	0.318	0.317	0.222	0.204	0.226
	(0.220)	(0.292)	(0.289)	(0.310)	(0.374)	(0.375)	(0.312)	(0.418)	(0.415)
Single child	-0.0413	-0.259	-0.259	0.103	-0.321	-0.323	-0.192	-0.0892	-0.0904
	(0.197)	(0.260)	(0.260)	(0.270)	(0.320)	(0.320)	(0.291)	(0.378)	(0.379)
SES score	-0.232*	-0.250+	-0.248+	-0.195	-0.228	-0.227	-0.296+	-0.298	-0.299
	(0.116)	(0.139)	(0.139)	(0.159)	(0.183)	(0.183)	(0.171)	(0.202)	(0.202)
Student leader in senior high school	0.610***	0.476*	0.476*	0.360	0.501*	0.494+	0.937***	0.518+	0.526+
	(0.162)	(0.197)	(0.197)	(0.224)	(0.255)	(0.256)	(0.234)	(0.285)	(0.285)

Humanity track in high school	0.293	0.722*	0.708*	-0.221	0.00500	-0.00394	0.569	0.983*	0.975*
	(0.258)	(0.358)	(0.356)	(0.375)	(0.464)	(0.464)	(0.362)	(0.483)	(0.482)
Arts or athlete student in high school	2.247***	1.626**	1.643**	2.239**	2.787***	2.795***	2.017**	0.777	0.805
	(0.464)	(0.604)	(0.604)	(0.740)	(0.833)	(0.839)	(0.621)	(0.785)	(0.785)
NCEE score (rescaled to 1~100)	0.0501***	0.0258	0.0263	0.0842***	0.0913***	0.0912***	0.0259	-0.0162	-0.0154
	(0.0142)	(0.0204)	(0.0203)	(0.0211)	(0.0272)	(0.0272)	(0.0198)	(0.0285)	(0.0283)
Science or Engineering major	-0.824**	-0.280	-0.279	-1.492***	-1.108*	-1.109*	-0.669+	-0.0888	-0.0834
	(0.268)	(0.353)	(0.354)	(0.376)	(0.485)	(0.489)	(0.392)	(0.497)	(0.498)
Economics or Management major	-0.134	-0.0118	-0.0172	-0.603	-0.669	-0.666	0.0216	0.323	0.307
	(0.269)	(0.381)	(0.378)	(0.381)	(0.471)	(0.473)	(0.386)	(0.558)	(0.553)
Preference degree of one's major	1.291***	1.197***	1.201***	1.257***	1.105***	1.106***	1.350***	1.390***	1.396***
	(0.0998)	(0.123)	(0.123)	(0.138)	(0.159)	(0.159)	(0.144)	(0.182)	(0.182)
Hours spent per week on studying after class	0.0458***	0.0549***	0.0549***	0.0518***	0.0692***	0.0695***	0.0356***	0.0317**	0.0316**
	(0.00716)	(0.00810)	(0.00812)	(0.00991)	(0.0106)	(0.0106)	(0.0104)	(0.0116)	(0.0116)
Have a minor	0.202	0.427	0.434	0.393	0.377	0.362	0.204	0.568	0.594
	(0.299)	(0.366)	(0.364)	(0.409)	(0.448)	(0.447)	(0.439)	(0.520)	(0.519)
Party member	1.661***	1.615***	1.613***	1.573***	1.694***	1.697***	1.874***	1.655***	1.650***
	(0.180)	(0.214)	(0.214)	(0.241)	(0.276)	(0.277)	(0.270)	(0.321)	(0.321)
Student leader	0.648***	0.470*	0.478*	0.349	0.190	0.201	0.834**	0.565+	0.565+
	(0.196)	(0.231)	(0.231)	(0.270)	(0.296)	(0.296)	(0.285)	(0.333)	(0.333)
Have merit-based aid	4.198***	4.161***	4.167***	4.639***	4.640***	4.633***	3.732***	3.698***	3.715***
	(0.177)	(0.215)	(0.215)	(0.240)	(0.274)	(0.275)	(0.261)	(0.323)	(0.324)
Have need-based aid	0.144	0.366	0.363	-0.149	-0.160	-0.157	0.375	0.745*	0.735+
	(0.205)	(0.252)	(0.251)	(0.277)	(0.315)	(0.316)	(0.302)	(0.379)	(0.378)
Have loan	-0.211	-0.291	-0.303	0.200	0.0276	0.0199	-0.518+	-0.465	-0.475
	(0.196)	(0.242)	(0.242)	(0.272)	(0.318)	(0.319)	(0.282)	(0.350)	(0.350)
Comprehensive institutions	0.493+	0.179	0.188	-0.602	-0.935+	-0.947+	1.343***	1.335*	1.350*
	(0.256)	(0.352)	(0.349)	(0.417)	(0.487)	(0.488)	(0.407)	(0.556)	(0.554)
Engineering-concentrated	-0.404	-0.923**	-0.914**	-1.981***	-2.568***	-2.579***	-0.0336	-0.900+	-0.887+

institutions	(0.247)	(0.332)	(0.328)	(0.414)	(0.483)	(0.485)	(0.369)	(0.495)	(0.489)
"985" institution	0.299	0.431	0.430	-0.0131	-0.00603	-0.0121	.	.	.
	(0.300)	(0.355)	(0.357)	(0.295)	(0.346)	(0.347)	.	.	.
"211" institution	-0.177	-0.191	-0.188	.	.	.	.	.	.
	(0.196)	(0.231)	(0.231)	.	.	.	.	.	.
Independent college	2.837***	3.999***	4.022***	.	.	.	3.331***	4.348***	4.385***
	(0.550)	(0.805)	(0.803)	.	.	.	(0.661)	(0.911)	(0.910)
Institution located in municipalities	0.367	0.855*	0.845*	1.409**	1.982***	1.984***	0.362	0.849	0.837
	(0.332)	(0.383)	(0.382)	(0.477)	(0.588)	(0.587)	(0.626)	(0.651)	(0.653)
Institution located in central or west area	-0.372	-0.202	-0.198	0.495	0.743	0.753	-0.593	0.0262	0.0291
	(0.280)	(0.332)	(0.332)	(0.452)	(0.528)	(0.530)	(0.455)	(0.529)	(0.529)
Campus located in suburban	-0.432*	-0.101	-0.0979	-0.480	-0.0979	-0.110	-0.147	0.168	0.179
	(0.189)	(0.246)	(0.245)	(0.298)	(0.367)	(0.367)	(0.282)	(0.361)	(0.362)
% of low-SES students in the institution	-5.462***	-4.930***	-4.986***	-6.957***	-6.413***	-6.433***	-2.448	-2.407	-2.430
	(1.153)	(1.405)	(1.405)	(1.550)	(1.742)	(1.741)	(1.946)	(2.419)	(2.428)
Constant	69.30***	71.44***	71.45***	71.69***	73.70***	73.71***	66.65***	67.90***	67.92***
	(2.337)	(2.950)	(2.948)	(3.353)	(4.227)	(4.222)	(3.358)	(4.179)	(4.179)
N	5,053	5,052	5,052	2,460	2,460	2,460	2,593	2,592	2,592
R-sq	0.328	0.347	0.348	0.366	0.400	0.399	0.313	0.334	0.335
adj. R-sq	0.322	0.341	0.342	0.355	0.389	0.388	0.301	0.323	0.324

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Missing dummies are included in all models;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

TableA3.3 PSM estimates of the impact of term-time working on initial employment status (Dependent variable: whether being offered a job before graduation)

	Whole sample			Elite institution sample			Non-elite institution sample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS w/o weights	Kernel matching	Radius caliper matching	OLS w/o weights	Kernel matching	Radius caliper matching	OLS w/o weights	Kernel matching	Radius caliper matching
Ever worked in term-time	0.0786***	0.0921***	0.0916***	0.0811**	0.0882**	0.0887**	0.0843***	0.0973***	0.0961***
	(0.0172)	(0.0219)	(0.0218)	(0.0259)	(0.0298)	(0.0299)	(0.0237)	(0.0288)	(0.0286)
Ever worked in vacations	0.0648***	0.0661**	0.0658**	0.0538*	0.0572*	0.0560+	0.0739***	0.0734**	0.0735**
	(0.0145)	(0.0218)	(0.0216)	(0.0221)	(0.0286)	(0.0288)	(0.0193)	(0.0279)	(0.0277)
Age	0.00141	-0.00762	-0.00702	0.00594	-0.00106	-0.00115	0.00101	-0.00197	-0.00119
	(0.00743)	(0.0105)	(0.0104)	(0.0111)	(0.0127)	(0.0127)	(0.0101)	(0.0145)	(0.0144)
Female	-0.0172	-0.00271	-0.00491	-0.0210	-0.0133	-0.0151	-0.0122	0.0119	0.0107
	(0.0168)	(0.0244)	(0.0241)	(0.0259)	(0.0337)	(0.0337)	(0.0223)	(0.0297)	(0.0295)
Minority	-0.0596*	-0.130**	-0.128**	-0.0552	-0.131**	-0.127*	-0.0532	-0.0496	-0.0503
	(0.0295)	(0.0432)	(0.0429)	(0.0386)	(0.0503)	(0.0500)	(0.0463)	(0.0543)	(0.0544)
Single child	-0.0209	-0.0190	-0.0201	-0.0470+	-0.0470	-0.0449	0.00103	0.0124	0.00939
	(0.0179)	(0.0271)	(0.0271)	(0.0271)	(0.0360)	(0.0361)	(0.0245)	(0.0361)	(0.0360)
From rural area	0.0466*	0.0625+	0.0626*	0.0640*	0.0448	0.0456	0.0405	0.0984*	0.0969*
	(0.0191)	(0.0324)	(0.0319)	(0.0289)	(0.0395)	(0.0396)	(0.0259)	(0.0386)	(0.0381)
SES score	-0.00232	-0.00387	-0.00354	-0.0102	-0.0189	-0.0191	0.00299	0.00542	0.00582
	(0.0106)	(0.0152)	(0.0151)	(0.0158)	(0.0184)	(0.0185)	(0.0145)	(0.0205)	(0.0203)
Student leader in senior high school	0.0775**	0.110**	0.110**	0.0848*	0.116*	0.117*	0.0886**	0.102*	0.101*
	(0.0237)	(0.0399)	(0.0399)	(0.0373)	(0.0555)	(0.0559)	(0.0318)	(0.0493)	(0.0489)
Humanity track in high school	-0.0481*	-0.0497	-0.0480	-0.0764*	-0.0960+	-0.0963+	-0.0139	0.00733	0.00902
	(0.0231)	(0.0392)	(0.0390)	(0.0373)	(0.0579)	(0.0583)	(0.0299)	(0.0456)	(0.0453)
Arts or athlete student in high school	-0.105*	-0.0804	-0.0799	-0.0758	0.0317	0.0384	-0.0868	-0.101	-0.105
	(0.0435)	(0.0681)	(0.0673)	(0.0773)	(0.0858)	(0.0843)	(0.0539)	(0.0804)	(0.0797)

NCEE score (rescaled to 1~100)	0.000876	0.00237	0.00222	-0.000348	0.00350	0.00350	0.00238	0.00363	0.00342
	(0.00123)	(0.00179)	(0.00177)	(0.00199)	(0.00239)	(0.00239)	(0.00167)	(0.00239)	(0.00236)
Average course score	0.000980	0.000582	0.000647	0.00442*	0.00182	0.00185	-0.00125	-0.000891	-0.000849
	(0.00139)	(0.00201)	(0.00199)	(0.00216)	(0.00299)	(0.00298)	(0.00184)	(0.00244)	(0.00241)
Science or Engineering major	0.0372+	0.0749*	0.0768*	0.0679*	0.139***	0.140***	0.00286	0.00394	0.00539
	(0.0216)	(0.0360)	(0.0355)	(0.0306)	(0.0390)	(0.0389)	(0.0310)	(0.0499)	(0.0493)
Economics or Management major	0.0165	0.0107	0.0107	0.00916	-0.000784	0.000121	0.0208	0.0176	0.0172
	(0.0147)	(0.0214)	(0.0213)	(0.0223)	(0.0301)	(0.0301)	(0.0197)	(0.0270)	(0.0269)
Have a minor	0.0345	-0.0204	-0.0184	0.0822*	0.120**	0.118**	-0.00317	-0.0908	-0.0870
	(0.0263)	(0.0503)	(0.0492)	(0.0333)	(0.0382)	(0.0385)	(0.0387)	(0.0710)	(0.0699)
Preference degree of one's major	0.0265**	0.0322*	0.0319*	0.0168	0.0308+	0.0307+	0.0304*	0.0291+	0.0290+
	(0.00908)	(0.0128)	(0.0127)	(0.0138)	(0.0159)	(0.0160)	(0.0122)	(0.0173)	(0.0172)
Pass CET-6	0.0585**	0.0676*	0.0681*	0.105**	0.130**	0.130**	0.0397	0.0169	0.0170
	(0.0219)	(0.0311)	(0.0309)	(0.0341)	(0.0440)	(0.0439)	(0.0295)	(0.0389)	(0.0388)
Pass CET-4	0.0525**	0.0675*	0.0687*	0.111***	0.112**	0.114**	0.0193	0.0356	0.0364
	(0.0193)	(0.0291)	(0.0289)	(0.0312)	(0.0427)	(0.0428)	(0.0250)	(0.0340)	(0.0338)
Student leader	0.0176	0.0482+	0.0469+	0.0366	0.0747*	0.0723*	-0.00288	0.0106	0.0106
	(0.0178)	(0.0277)	(0.0275)	(0.0260)	(0.0361)	(0.0361)	(0.0246)	(0.0353)	(0.0350)
CCP member	0.0132	0.0166	0.0160	-0.0107	-0.0235	-0.0225	0.0299	0.0398	0.0382
	(0.0167)	(0.0256)	(0.0255)	(0.0244)	(0.0339)	(0.0340)	(0.0231)	(0.0332)	(0.0330)
Have professional certificates	0.0198	0.0444*	0.0444*	-0.00725	-0.00349	-0.00275	0.0352+	0.0632*	0.0628*
	(0.0143)	(0.0207)	(0.0205)	(0.0221)	(0.0277)	(0.0277)	(0.0191)	(0.0271)	(0.0269)
Have merit-based aid	-0.0279	-0.0265	-0.0260	-0.0541*	-0.0878*	-0.0873*	-0.00930	0.00881	0.0100
	(0.0176)	(0.0269)	(0.0268)	(0.0276)	(0.0377)	(0.0377)	(0.0235)	(0.0322)	(0.0319)
Have need-based aid	0.0141	0.0217	0.0215	0.00749	0.0411	0.0415	0.0189	0.0106	0.0105
	(0.0187)	(0.0296)	(0.0294)	(0.0273)	(0.0372)	(0.0371)	(0.0259)	(0.0388)	(0.0387)
Have loan	0.0448**	0.0514*	0.0508*	-0.0122	0.0139	0.0136	0.0777***	0.0803**	0.0800**
	(0.0169)	(0.0257)	(0.0256)	(0.0266)	(0.0365)	(0.0367)	(0.0223)	(0.0305)	(0.0304)
No. of job applications	0.000698*	0.000583	0.000580	0.000275	-0.000339	-0.000336	0.000891*	0.00112+	0.00111+
	(0.000332)	(0.000469)	(0.000467)	(0.000543)	(0.000713)	(0.000713)	(0.000426)	(0.000581)	(0.000578)

% of low-SES students in the institution	-0.0216	-0.209	-0.214	0.381*	0.423*	0.420*	-0.235+	-0.472*	-0.477*
	(0.103)	(0.140)	(0.139)	(0.165)	(0.197)	(0.197)	(0.140)	(0.189)	(0.188)
Comprehensive institutions	0.0159	0.0255	0.0237	-0.0705+	-0.153**	-0.153**	0.0475	0.115**	0.113**
	(0.0216)	(0.0356)	(0.0353)	(0.0413)	(0.0551)	(0.0551)	(0.0296)	(0.0428)	(0.0425)
Engineering-concentrated institutions	0.108***	0.142***	0.141***	0.0403	0.00725	0.00757	0.155***	0.202***	0.200***
	(0.0218)	(0.0334)	(0.0331)	(0.0368)	(0.0502)	(0.0503)	(0.0298)	(0.0422)	(0.0419)
"985" institution	0.0761**	0.0884**	0.0887**		0.104***	0.104***			
	(0.0238)	(0.0324)	(0.0323)		(0.0307)	(0.0308)			
"211" institution	-0.0143	-0.0170	-0.0175	-0.0923***					
	(0.0176)	(0.0263)	(0.0261)	(0.0241)					
Independent college	-0.168**	-0.261***	-0.267***				-0.176**	-0.268***	-0.274***
	(0.0548)	(0.0586)	(0.0584)				(0.0576)	(0.0619)	(0.0615)
Institution located in central or west area	0.00659	0.0354	0.0358	-0.00785	-0.00386	-0.00304	0.0188	0.0856+	0.0866*
	(0.0197)	(0.0290)	(0.0289)	(0.0320)	(0.0384)	(0.0385)	(0.0301)	(0.0440)	(0.0437)
Institution locates in small city	-0.0839***	-0.0522	-0.0521	-0.0717	0.0758	0.0747	-0.0639*	-0.0684+	-0.0671+
	(0.0243)	(0.0344)	(0.0342)	(0.0506)	(0.0552)	(0.0552)	(0.0291)	(0.0369)	(0.0367)
N	4,496	4,431	4,431	1,906	1,872	1,872	2,585	2,556	2,556
Psuedo R_sq	0.212	0.237	0.238	0.255	0.280	0.280	0.205	0.251	0.251

Notes: 1. Sampling weights are applied and robust standard errors in parentheses;
2. Missing dummies are included in all models;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

TableA3.4 PSM estimates of the impact of term-time working on starting wage (Dependent variable: starting monthly wage)

	Whole sample		
	(1)	(2)	(3)
	OLS w/o weights	Kernel matching	Radius caliper matching
Ever worked in term-time	-0.0201	-0.0141	-0.0142
	(0.0158)	(0.0174)	(0.0174)
Ever worked in vacations	-0.00349	-0.0148	-0.0152
	(0.0133)	(0.0165)	(0.0165)
Age	0.108***	0.108***	0.108***
	(0.0187)	(0.0219)	(0.0220)
Female	0.00356	0.00927	0.00883
	(0.00689)	(0.00909)	(0.00910)
Minority	-0.0848***	-0.0859***	-0.0855***
	(0.0159)	(0.0211)	(0.0212)
Single child	0.0311	0.00543	0.00582
	(0.0269)	(0.0314)	(0.0315)
From rural area	-0.00978	0.00794	0.00907
	(0.0170)	(0.0213)	(0.0213)
SES score	-0.0203	-0.0560*	-0.0551*
	(0.0177)	(0.0226)	(0.0226)
Student leader in senior high school	0.0287**	0.0204	0.0203
	(0.0102)	(0.0131)	(0.0132)
Humanity track in high school	0.0259+	0.0352*	0.0356*
	(0.0134)	(0.0177)	(0.0177)
Arts or athlete student in high school	-0.0505*	-0.0454	-0.0459
	(0.0230)	(0.0301)	(0.0302)
NCEE score (rescaled to 1~100)	0.00650	-0.0454	-0.0443
	(0.0432)	(0.0593)	(0.0600)
Average course score	0.00572***	0.00655***	0.00652***
	(0.00131)	(0.00178)	(0.00179)
Science or Engineering major	0.000565	-0.000871	-0.000810
	(0.00131)	(0.00181)	(0.00181)
Economics or Management major	-0.0161	-0.0159	-0.0154
	(0.0248)	(0.0326)	(0.0327)
Have a minor	-0.0752**	-0.0758*	-0.0751*
	(0.0243)	(0.0338)	(0.0340)
Preference degree of one's major	-0.000350	-0.0531	-0.0520
	(0.0261)	(0.0384)	(0.0386)
Pass CET-6	0.0258**	0.0387***	0.0387***
	(0.00849)	(0.0108)	(0.0108)
Pass CET-4	0.122***	0.113***	0.113***
	(0.0223)	(0.0270)	(0.0271)
Student leader	0.0703***	0.0589*	0.0592*

	(0.0191)	(0.0254)	(0.0254)
CCP member	0.0415*	0.0373+	0.0376+
	(0.0167)	(0.0222)	(0.0223)
Have professional certificates	0.0352*	0.0243	0.0231
	(0.0153)	(0.0212)	(0.0213)
Have merit-based aid	0.00798	-0.00724	-0.00702
	(0.0130)	(0.0174)	(0.0174)
Have need-based aid	0.0241	0.0263	0.0269
	(0.0155)	(0.0206)	(0.0206)
Have loan	-0.0260	-0.0389+	-0.0382+
	(0.0163)	(0.0213)	(0.0212)
% of low-SES students in the institution	-0.0259+	-0.0221	-0.0223
	(0.0151)	(0.0184)	(0.0184)
Comprehensive institutions	-0.236*	-0.122	-0.122
	(0.104)	(0.126)	(0.126)
Engineering-concentrated institutions	0.0756**	0.0492	0.0488
	(0.0249)	(0.0336)	(0.0337)
"985" institution	0.0480*	0.0409	0.0415
	(0.0237)	(0.0300)	(0.0300)
"211" institution	0.172***	0.133***	0.134***
	(0.0267)	(0.0333)	(0.0333)
Independent college	0.117***	0.101***	0.101***
	(0.0171)	(0.0203)	(0.0204)
Institution located in central or west area	-0.111*	-0.0549	-0.0536
	(0.0563)	(0.0859)	(0.0861)
Migrant to work	0.0115	0.0118	0.0111
	(0.0215)	(0.0229)	(0.0229)
Constant	7.157***	7.124***	7.131***
	(0.218)	(0.298)	(0.299)
N	2,955	2,868	2,868
R-squared	0.302	0.311	0.310
Adj. R-squared	0.277	0.285	0.284

Notes: 1. Sampling weights are applied and robust standard errors are in parentheses.
2. Industry, employer type, province of workplace, and missing dummies are included.
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

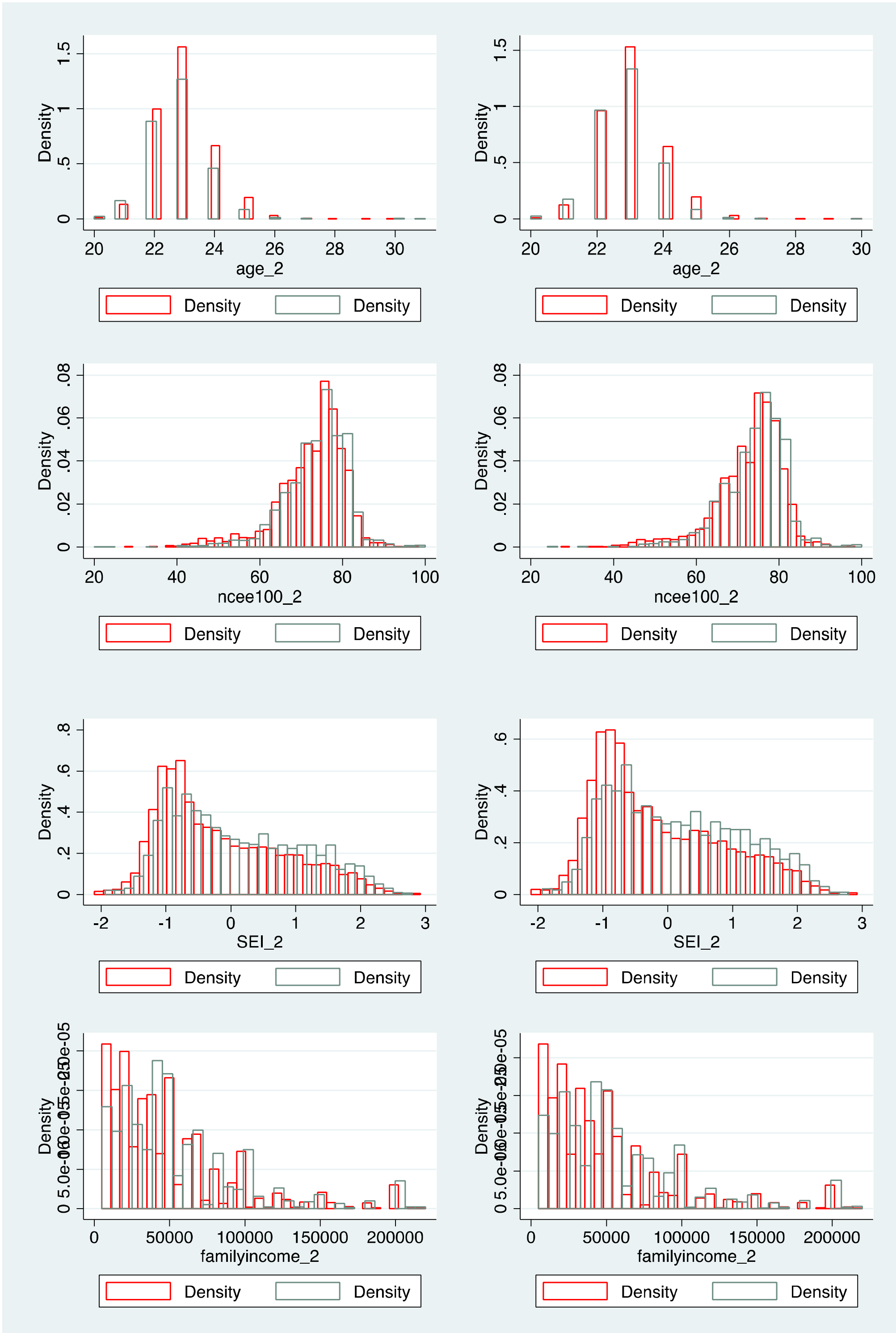

Figure A3.1 Density distribution of covariates in treated and untreated groups in the whole sample
(Left: pre-matched; Right: post-matched)
(Red: term-time=1; Teal: term-time=0)

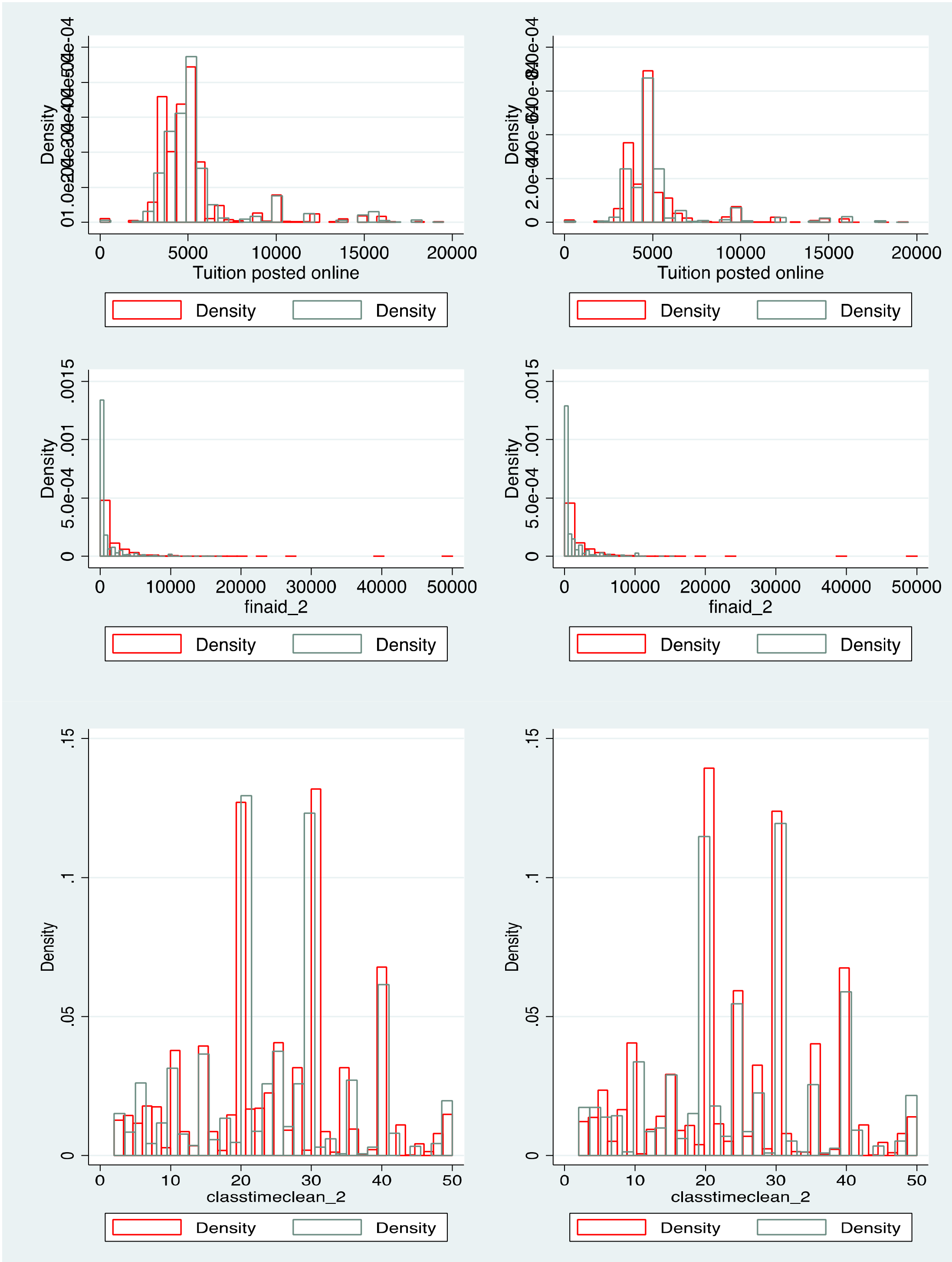

Figure A3.1 (continued) Density distribution of covariates in treated and untreated groups in the whole sample
(Left: pre-matched; Right: post-matched)
(Red: term-time=1; Teal: term-time=0)

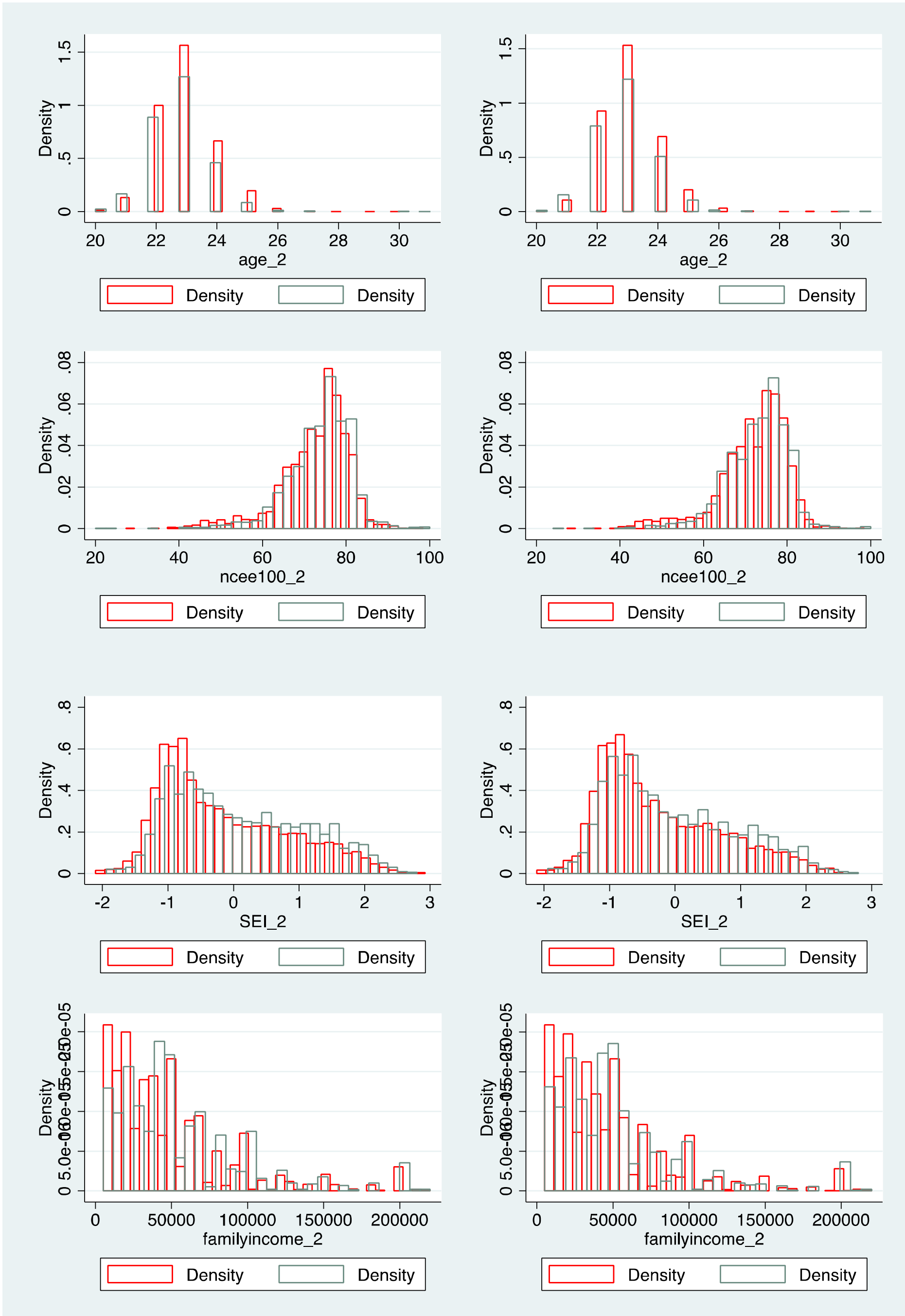

Figure A3.2 Density distribution of covariates in treated and untreated groups in the "Intention-to-Work" sample

(Left: pre-matched; Right: post-matched)

(Red: term-time=1; Teal: term-time=0)

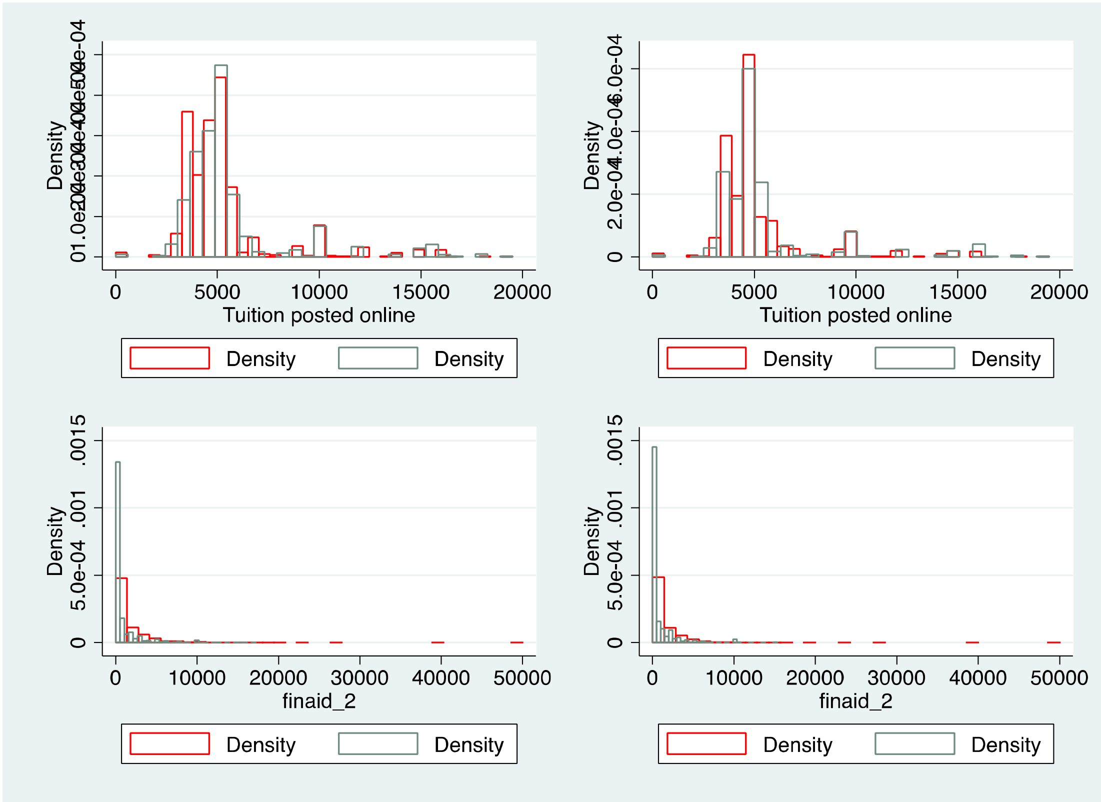

Figure A3.2 (continued) Density distribution of covariates in treated and untreated groups in the "Intention-to-Work" sample
(Left: pre-matched; Right: post-matched)
(Red: term-time=1; Teal: term-time=0)

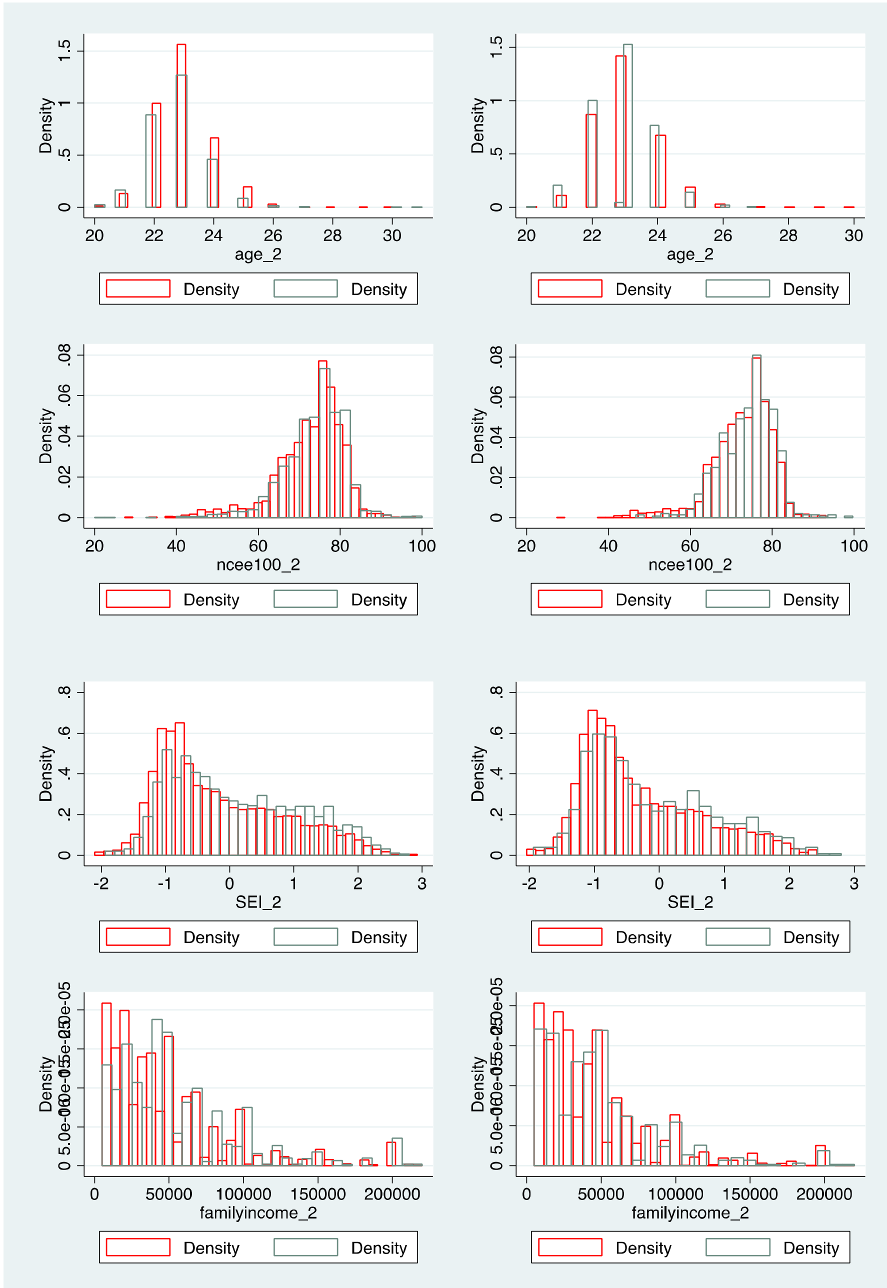

Figure A3.3 Density distribution of covariates in treated and untreated groups in the "Have wage" sample
(Left: pre-matched; Right: post-matched)
(Red: term-time=1; Teal: term-time=0)

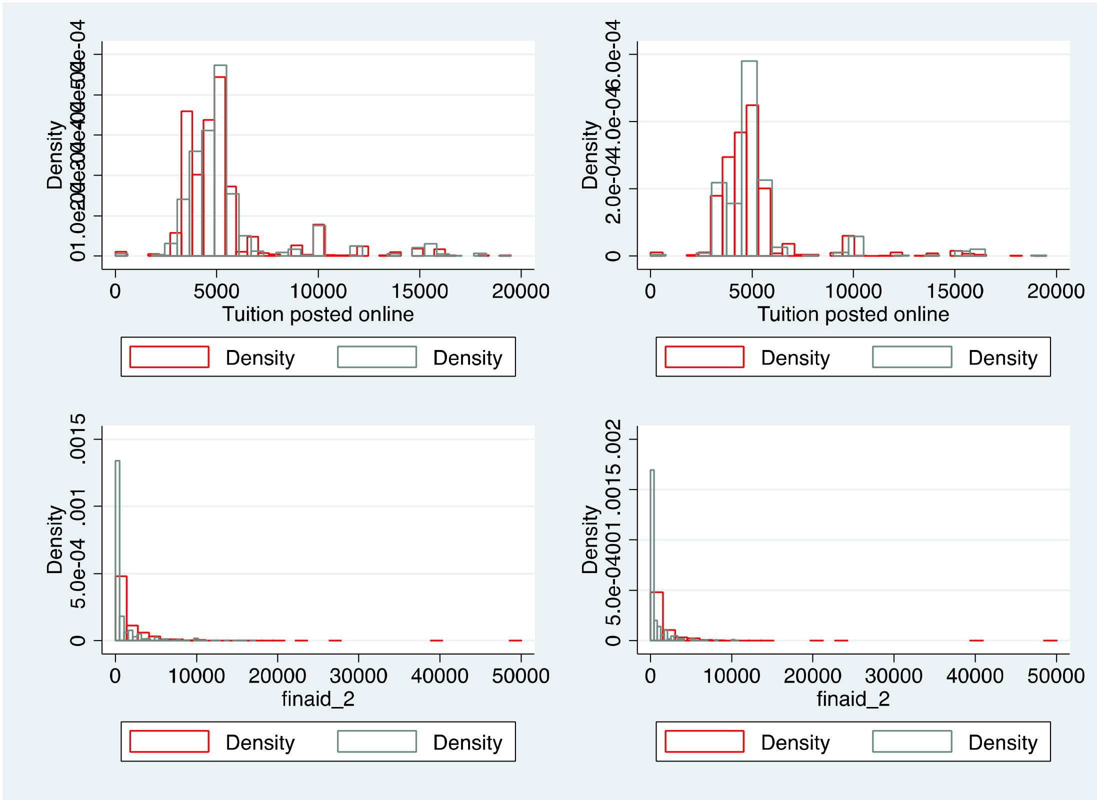

Figure A3.3 (continued) Density distribution of covariates in treated and untreated groups in the "Have wage" sample
(Left: pre-matched; Right: post-matched)
(Red: term-time=1; Teal: term-time=0)

Appendix 4. Sub-group analysis by elite and non-elite institution

Table A4.1 The impact of term-time working on academic performance by elite and non-elite institutions
(Dependent variable: average course score)

	OLS estimate		IV estimate	
	(1)	(2)	(3)	(4)
	Elite	Non-Elite	Elite	Non-Elite
Ever worked in term time	-0.403	-0.769*	-8.606*	-11.18*
	(0.309)	(0.380)	(4.082)	(4.938)
Age	-0.108	0.141	0.0509	0.348
	(0.141)	(0.173)	(0.183)	(0.240)
Female	2.416***	2.112***	3.797***	2.653***
	(0.279)	(0.353)	(0.756)	(0.482)
Minority	-0.0523	-0.231	-0.317	-1.364
	(0.411)	(0.826)	(0.538)	(1.117)
From municipalities	-1.371*	-1.094	-1.435+	0.0186
	(0.604)	(0.896)	(0.796)	(1.243)
From central or west area	-0.528	-0.421	-0.363	0.267
	(0.348)	(0.534)	(0.415)	(0.717)
From rural area	1.086**	-0.283	2.021**	-0.107
	(0.363)	(0.427)	(0.631)	(0.508)
Single child	0.521	0.446	0.358	-0.563
	(0.343)	(0.403)	(0.426)	(0.670)
SES score	-0.126	-0.634**	-0.366	-0.939**
	(0.195)	(0.233)	(0.270)	(0.309)
Student leader in senior high school	-0.0231	1.179***	0.197	1.534***
	(0.267)	(0.344)	(0.347)	(0.426)
Humanity track in high school	-0.0844	0.566	0.0786	0.319
	(0.452)	(0.579)	(0.536)	(0.652)
Arts or athlete student in high school	2.223**	1.923	3.254**	0.892
	(0.766)	(1.175)	(1.036)	(1.435)
NCEE score (rescaled to 1~100)	0.0928***	0.0557+	0.0803*	-0.0148
	(0.0263)	(0.0330)	(0.0319)	(0.0489)
Science or Engineering major	-1.726***	-0.801	-2.515***	-1.469*
	(0.511)	(0.593)	(0.720)	(0.724)
Economics or Management major	-0.682	-0.523	-0.746	-1.005
	(0.456)	(0.647)	(0.550)	(0.724)
Preference degree of one's major	1.203***	1.290***	1.081***	1.273***
	(0.161)	(0.227)	(0.198)	(0.260)
Hours spent per week on studying after class	0.0572***	0.0223	0.0494***	0.0345+
	(0.0109)	(0.0188)	(0.0136)	(0.0203)
Have a minor	0.460	1.304*	0.503	2.173**
	(0.437)	(0.609)	(0.572)	(0.835)
Party member	1.843***	1.068**	1.738***	0.508
	(0.264)	(0.381)	(0.333)	(0.532)

Student leader	0.202	0.594	0.464	0.864+
	(0.337)	(0.394)	(0.401)	(0.488)
Have merit-based aid	4.511***	3.907***	4.871***	4.634***
	(0.276)	(0.362)	(0.387)	(0.557)
Have need-based aid	-0.323	0.779*	0.552	1.269**
	(0.322)	(0.373)	(0.556)	(0.484)
Have loan	-0.0725	-0.324	0.343	0.465
	(0.330)	(0.381)	(0.423)	(0.579)
Comprehensive institutions	-0.599	1.048*	0.133	0.602
	(0.440)	(0.513)	(0.692)	(0.603)
Engineering-concentrated institutions	-1.466***	-1.039*	-0.902	-2.536**
	(0.412)	(0.427)	(0.581)	(0.837)
"985" institution	0.105	.	-0.228	.
	(0.320)	.	(0.417)	.
"211" institution	.	.	.	.
	.	.	.	.
Independent college	.	1.783*	.	0.235
	.	(0.887)	.	(1.176)
Institution located in municipalities	1.043+	-0.250	0.733	-0.716
	(0.579)	(0.899)	(0.686)	(1.137)
Institution located in central or west area	0.648	0.794	0.000932	-0.158
	(0.542)	(0.610)	(0.721)	(0.884)
Campus located in suburban	-0.814*	-0.0402	-1.051*	0.182
	(0.373)	(0.385)	(0.445)	(0.515)
% of low-SES students in the institution	-7.431***	-5.009+	-8.565***	-3.539
	(1.630)	(2.732)	(2.082)	(3.524)
Constant	71.03***	66.80***	73.87***	75.06***
	(4.023)	(5.361)	(5.040)	(6.738)
N	2,460	2,593	2,460	2,593
R-square	0.371	0.310	0.075	.
Adj. R-square	0.360	0.298	0.059	.

Notes: 1. Sampling weights are applied, and robust standard errors in parentheses;
2. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
3. Missing dummies are included in the model.

Table A4.2 The OLS & IV estimates of the impact of term-time working on initial employment status by elite and non-elite institutions
(Dependent variable: whether being offered a job before graduation)

	OLS estimate		IV estimate	
	(1)	**(2)**	**(3)**	**(4)**
	Elite	**Non-Elite**	**Elite**	**Non-Elite**
Ever worked in term-time	0.107***	0.0679*	0.403**	0.504***
	(0.0303)	(0.0345)	(0.146)	(0.118)
Ever worked in vacations	0.0441+	0.138***	0.0272	0.0558
	(0.0257)	(0.0282)	(0.0208)	(0.0346)
Age	-0.00155	0.000741	-0.00262	-0.0054
	(0.0129)	(0.0147)	(0.00926)	(0.0101)
Female	-0.0443	-0.0580+	-0.0644*	-0.0677**
	(0.0319)	(0.0338)	(0.0250)	(0.0218)
Minority	-0.0515	-0.0431	-0.0503+	0.0319
	(0.0411)	(0.0617)	(0.0266)	(0.0478)
Single child	-0.0553+	-0.0499	-0.0356	0.0262
	(0.0319)	(0.0368)	(0.0241)	(0.0336)
From rural area	0.0682*	-0.00766	0.0184	-0.00721
	(0.0323)	(0.0388)	(0.0365)	(0.0251)
SES score	-0.0206	-0.000500	-0.00784	0.00645
	(0.0170)	(0.0218)	(0.0141)	(0.0149)
Student leader in senior high school	0.0148	0.0691*	-0.0116	0.0164
	(0.0262)	(0.0290)	(0.0229)	(0.0260)
Humanity track in high school	-0.0547	-0.000866	-0.0371	0.0110
	(0.0453)	(0.0478)	(0.0307)	(0.0319)
Arts or athlete student in high school	-0.00829	-0.0110	-0.0435	0.0403
	(0.0728)	(0.0687)	(0.0552)	(0.0468)
NCEE score (rescaled to 1~100)	-0.000442	0.00428+	0.000603	0.00564**
	(0.00206)	(0.00242)	(0.00168)	(0.00164)
Average course score	0.00372	-0.00667*	0.00198	-0.00280
	(0.00269)	(0.00261)	(0.00209)	(0.00231)
Science or Engineering major	0.0976*	0.0968+	0.103**	0.0843*
	(0.0487)	(0.0499)	(0.0324)	(0.0335)
Economics or Management major	0.0881*	-0.00509	0.0824**	0.0133
	(0.0364)	(0.0478)	(0.0299)	(0.0311)
Have a minor	0.0924*	0.0158	0.0799*	-0.0248
	(0.0374)	(0.0577)	(0.0355)	(0.0399)
Preference degree of one's major	0.0117	0.0580**	0.0234+	0.0340*
	(0.0146)	(0.0187)	(0.0122)	(0.0154
Pass CET-6	0.129***	0.0487	0.0633	0.0378
	(0.0375)	(0.0429)	(0.0463)	(0.0295)
Pass CET-4	0.0925**	0.0550	0.0564+	0.0524*

	(0.0339)	(0.0359)	(0.0341)	(0.0242)
Student leader	0.0590*	-0.0341	0.0286	-0.0193
	(0.0294)	(0.0379)	(0.0277)	(0.0253)
CCP member	-0.0119	0.0615+	0.00430	0.0566*
	(0.0280)	(0.0343)	(0.0215)	(0.0231)
Have professional certificates	0.00707	0.0472+	-0.000584	0.0131
	(0.0263)	(0.0284)	(0.0201)	(0.0215)
Have merit-based aid	-0.0436	0.0148	-0.0422+	-0.0277
	(0.0332)	(0.0349)	(0.0226)	(0.0254)
Have need-based aid	-0.0143	0.0829*	-0.0510+	0.0312
	(0.0311)	(0.0366)	(0.0278)	(0.0307)
Have loan	-0.0337	0.0786*	-0.0321	0.0127
	(0.0291)	(0.0344)	(0.0206)	(0.0309)
No. of job applications	0.000686	0.00192**	0.000251	0.000609
	(0.000633)	(0.000662)	(0.000484)	(0.000613)
% of low-SES students in the institution	0.330+	0.326+	0.229+	0.076
	(0.174)	(0.187)	(0.135)	(0.145)
Comprehensive institutions	-0.0694	-0.00192	-0.0705*	0.0200
	(0.0489)	(0.0439)	(0.0345)	(0.0299)
Engineering-concentrated institutions	0.0407	0.148***	0.00104	0.164***
	(0.0402)	(0.0381)	(0.0370)	(0.0260)
"985" institution	0.107***		0.0772**	
	(0.0265)		(0.0274)	
"211" institution				
Independent college		-0.110+		0.00850
		(0.0606)		(0.0529)
Institution located in central or west area	-0.0201	-0.0554	-0.0122	-0.0123
	(0.0380)	(0.0418)	(0.0273)	(0.0306)
Institution locates in small city	-0.0590	-0.130***	-0.0454	-0.0550
	(0.0511)	(0.0347)	(0.0340)	(0.0374)
N	1,906	2,585	1,906	2,585
Pseudo R_sq	0.260	0.220	.	.
Weak-IV F-stat	.	.	9.778	11.368

Notes: 1. Marginal effects are reported;
2. Sampling weights are applied, and robust standard errors in parentheses;
3. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001;
4.Missing dummies are included in the model.