Overeducation in the Chinese Labour Market

By:

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Abstract

The match between education and job is an important indicator of the functioning of the labour market. Overeducation can be described as when an individual's educational level is higher than the schooling required for his job. Since the college expansion in 1999 in China, more graduates are reported to be found in jobs for which they are overeducated. This thesis focuses on the exploration of the phenomenon of overeducation and its impact on the Chinese labour market.

Using longitudinal data from the China Health and Nutrition Survey (CHNS) from 1989 to 2009, the extent and determinants of overeducation are investigated in Chapter 2. A variety of techniques are employed to study the wage effect of overeducation in the Chinese labour market. Based on the empirical results of this chapter, the extent of overeducation and undereducation in China, using two indexes to define required education, are found to be different. In addition, it is found that males and workers who have urban registration are more likely to be overeducated in both indexes. Furthermore, workers who have less experience tend to be overeducated, which is only found in the mean index. In terms of wage returns to overeducation, time effects indeed play an important role in China. The wage penalty to overeducation becomes smaller and even disappears between overeducated people and correctly educated people after taking unobserved heterogeneity into consideration. Additionally, this chapter attempts to ascertain if there are distinct wage effects of overeducation for different age groups and explores the patterns of wage effects of overeducation over time. The results indicate that different patterns of wage effects of overeducation by age groups and over time can be explained by the education and labour market reform in China since 1978.

Chapter 3 explores detailed links between educational mismatch, skill mismatch and job satisfaction in China. Results in this chapter suggest that overeducated people are more satisfied with their workload, working conditions and facilities, their relationship with colleagues and their housing benefits than correctly educated individuals in similar jobs. When educational mismatch and skill mismatch are included simultaneously into the analysis of job satisfaction, skill mismatch demonstrates stronger negative effects on overall job satisfaction and many facets of job satisfaction except for job satisfaction with welfare, workload and commuting distance to job location than educational

mismatch, which suggests that firms and policy makers should put more emphasis on improving the match between the labour market's needs and individuals' skill levels.

Given the important role played by rural-to-urban migrant workers in contemporary China, Chapter 4 provides a picture of education and educational mismatch issues associated with rural-to-urban migrant workers. This chapter contributes to the existing literature on the education of migrant workers by taking the generation of migrant workers into consideration, i.e. we distinguish between an old generation of migrant workers and a new generation of migrant workers. Based on OLS regression, the new generation of migrant workers has higher wage returns to schooling than the old generation of migrant workers. Quantile regression results indicate that the new generation of migrant workers have higher wage returns to schooling in the lower half of the wage distribution (i.e. 10^{th}, 25^{th} and 50^{th} percentiles). Wage effects of undereducation between old and new generation migrant workers exist at the 25^{th} percentile and 75^{th} percentile of the wage distribution. However, distinct wage effects of overeducation between old and new generation migrant workers can only be found in the high end of the wage distribution (90^{th} percentile). In addition, a comparative study of the issue of educational mismatch between rural-to-urban migrant workers and urban residents is made in this chapter. Negative effects of overeducation appear across the wage distribution of urban residents except for the 90^{th} percentile. Positive impact of undereducation on wages can be seen from 25^{th} percentile to 90^{th} percentile. However, for migrant workers, overeducation doesn't exhibit negative effects on migrant workers on the conditional wage distribution. Wage premiums enjoyed by undereducated migrant workers are only present in the lower and middle part of the wage distribution except for the 90^{th} percentile.

This thesis concludes that empirical patterns of overeducation in the literature in terms of the incidence, determinants and wage effects are present in the Chinese labour market. Empirical results in this thesis indicate that overeducation may not result in negative effects on job satisfaction as a priori expectations and skill mismatch is a better indicator to explain job dissatisfaction than educational mismatch. Although there are no significant wage effects of overeducation for migrant workers, the new generation of migrant workers enjoys higher wage returns to education than their older counterparts. This thesis provides strong evidence that enhancing skills to commensurate with the market needs should be the main concern of policy makers if China desires to sustain its economic growth in the future.

JEL code: I20; I21; I24; I26; I28; J28; O15.
Keywords: Overeducation; Undereducation; Wage Returns; Unobserved Heterogeneity; Job Satisfaction; Skill Mismatch; Rural-to-Urban Migration.

Chapter 1 Introduction

1.1 Research background

1.1.1 Problem statement

In 1998, the Chinese Ministry of Education (MoE) issued the *Action Plan of Education Promotion for the 21st Century* to begin the journey of a nation-wide higher education expansion aiming to transform from an "elite higher education system" to "mass higher education". Trow (1973) argues that an enrollment rate of higher education that is above 15% can be called "Mass higher education", which is also the goal set by Chinese government to achieve by 2010. However, China has expanded its higher education more rapidly than expected since 1999 and it just achieved this goal in 2002, which is eight years earlier than planned (Bai, 2006)[1]. Many scholars and the media describe this radical higher education expansion in China as the "Great Leap Forward of Higher Education" (Shi and Xing, 2010). According to the China statistical database, the number of college enrollments increased gradually from 0.66 to 1.08 million from 1989 to 1998. However, the number of college enrollments in 1999 increased dramatically to 1.55 million and the number of new students enrolling in higher education in China was 4.47 million in 2004, 5.04 million in 2005 and 6.08 million in 2008. Up to 2011, the number had already climbed to 6.82 million, four times greater than that in 1999. The latest figure of college enrollment is 7.21 million in 2014. Figure 1 describes explicitly the process of the higher education expansion in China.

Although the average growth rate of real GDP in China has been over 10 per cent annually since 1999, it still cannot keep pace with the fast growth rate of the education expansion[2]. Therefore, massive college unemployment and underemployment has followed thereafter. Although there is no official figure to confirm the exact graduate unemployment rate, researchers state that the college graduate unemployment rate was over 30 per cent in China (Li and Zhang, 2010). College unemployment is an important challenge for policy makers who advocate for college expansion (Wan, 2006).

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[1] From year 1998 to 2002, the net college enrolment rate in China increased from 9.8 per cent to 15 per cent (Bai, 2006).

[2] See section 2.1.

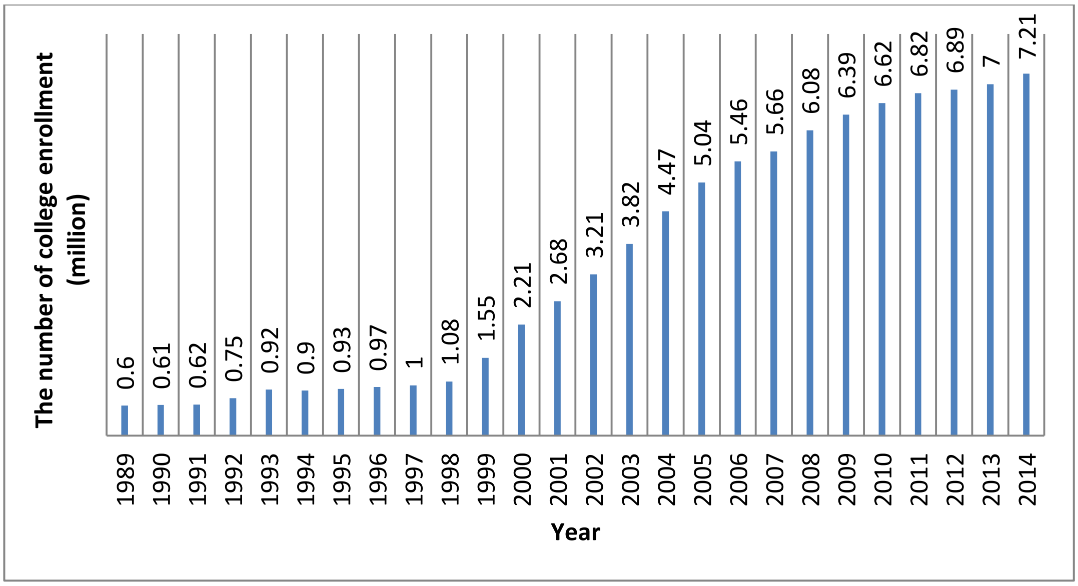

Figure 1: The number of college enrollments (million) (Year 1989-2014)

Source: Chinese statistical database

In addition to the issue of college unemployment, there are another three features in the labour market that needs to be paid attention:

Feature 1: Many new college entrants in the labour market find it difficult to secure their expected level job compared to graduates who entered the labour market in the 1990s who held the same qualification and additionally, the starting salary of new graduates fails to meet their expectations (Bai, 2006); (Zhang et al., 2012).

Feature 2: Many college graduates accept jobs that require less schooling than their actual educational levels or accept non-graduate jobs that are not matched with their education and expectations in order to make a living or to avoid being unemployed. For example, for those graduates who are employed in unskilled jobs with low pay are labeled as “Ant tribe”[3]. He and Mai (2015) argue that this “Ant tribe” group has two characteristics: (1) most of them work in low-skilled jobs and their average monthly wages are less than 2000 Yuan (£200 equivalent)[4]; (2) Their housing conditions are miserable and mainly accumulated in the fringes of the big cities. The total number of this group of college graduates was estimated to be more than 1 million in 2010 (He and Mai, 2015).

[3] http://www.bbc.co.uk/news/business-28062071

Feature 3: Although the supply of graduates has increased, skills owned by college graduates do not meet the requirement of the labour market. Many employers find it hard to hire qualified workers (Molnar et al., 2015). This feature can also be reflected by the fact that some graduates work in a job that is not matched with their subject of study. According to Molnar et al. (2015), about 31 per cent of university graduates and 38 per cent of vocational college graduates work in jobs that are not relevant to their majors.

The above three features can be described as the phenomenon of overeducation. Higher education expansion increases the average level of human capital of the labour force, which is beneficial for China's economic development and can raise its competitiveness. However, the negative effects of overeducation on the labour market cause deep concern from policy-makers about the ability of the labour market to absorb such a highly educated labour force. Although extraordinary economic development since the economic reform and after entering the WTO has been made in China, the growth rate of GDP has begun to decrease gradually from 2010 (See Figure 2). Therefore, exploring the phenomenon of overeducation has important implications for the Chinese labour market. Overeducation is not a new topic in western countries, however, relevant studies in China are limited.

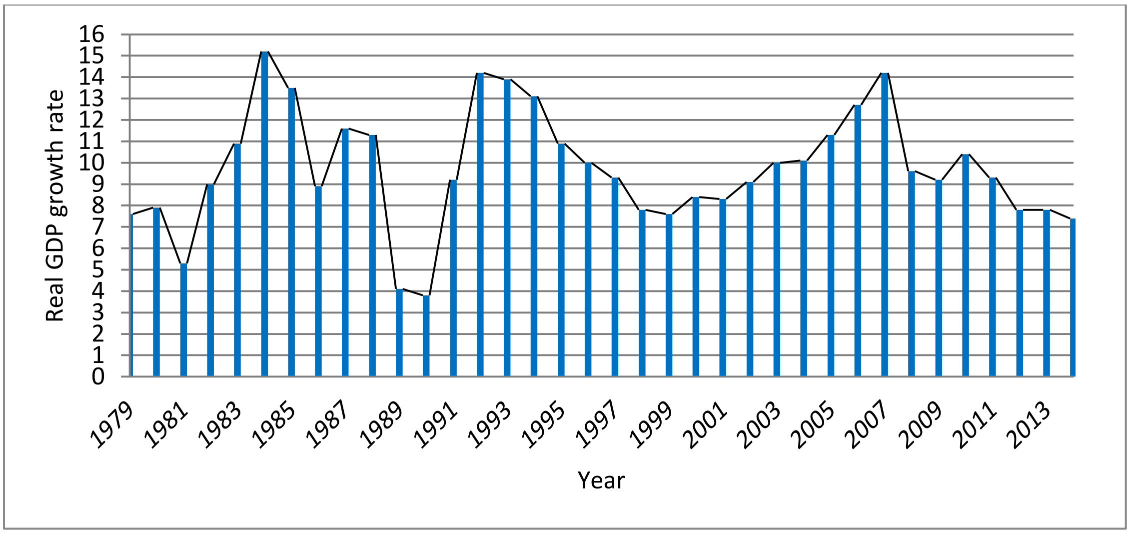

Figure 2: Growth rate of real GDP in China (1979-2014)

Source: International Monetary Fund (IMF)

[4] In 2010, the average monthly wage in China is 3045 Yuan (£300 equivalent). 2000 Yuan in China can only cover basic needs for living. Source: National Bureau of Statistics in China.

1.1.2 Overeducation and its impact on the labour market

Overeducation is an economic concept, which was first put forward by Freeman (1976) in his book *The overeducated American* to explain decreased wage returns to university graduates in the 1960s and 1970s. Overeducation can also be called *overqualification or overschooling*. As the name suggests, when an individual's educational attainment exceeds the normal requirement of his job, he or she is classified as overeducated (Duncan and Hoffman, 1981). Conversely, undereducation can be defined when an individual's educational attainment is less than the average requirement of his job. Overeducation can also be described as follows: firstly, that there is a decline in one's economic status to certain education level relative to people who have same education qualification in the past (Tsang and Levin, 1985). Second, that one's actual job condition is not consistent with his expectations (Tsang and Levin, 1985). Thirdly, that educational skills owned by workers are greater than the requirement of their jobs (Rumberger, 1981). By taking heterogeneity into consideration, some scholars explicitly define overeducation into "apparent overeducation" and "genuine overeducation" according to the degree of job satisfaction of the overeducated individuals (Chevalier, 2003). It also can be defined as "real overeducation" and "formal overeducation" depending on skills-utilisation (Green and Zhu, 2010).

In recent years in the overeducation literature, some scholars have differentiated between educational mismatch (overeducation and undereducation) and skill mismatch (over-skilled, under-skilled and domain mismatch). Most of the literature uses years of schooling or qualifications to describe mismatches between individuals and jobs because of the convenience of information in their data. Workers would report their educational levels as indicators of their skill levels. However, Green and McIntosh (2007) suggest that these two concepts are weakly correlated. Even if two workers have the same educational qualifications, their skills and abilities are heterogeneous. Sánchez-Sánchez and McGuinness (2013) argue that when the job entry requirement is not equal to the actual skills needed in the job, educational attainment is not a good proxy of human capital and therefore educational overeducation is not appropriate to represent skill mismatch status. According to Allen and Van der Velden (2001), skill mismatch has a negative impact on job satisfaction, while there is no evidence showing that educational overeducation can affect job satisfaction. However, the measurement of skill mismatch is more complicated than educational mismatch. In empirical analysis, the decision of whether to distinguish skill mismatch and educational mismatch depends largely on data availability.

Overeducation is found to be related to many labour market outcomes, such as wages and job satisfaction. Empirical evidence has indicated that overeducated individuals have lower wages than people who have similar educational levels but who are correctly educated for their jobs. However, overeducated people have higher wages compared to those who work in the same job but are estimated as adequately matched. In the Overeducation-Required education-Undereducation (ORU) methodology (Duncan and Hoffman, 1981), both wage returns to required education and wage returns to surplus education are positive, but wage returns to required education are higher than returns to surplus education (Hartog, 1985); (Rumberger, 1987); (Alba-Ramirez, 1993). Low wage returns to one additional year of surplus schooling to some extent means an inefficient investment in education, which is potentially harmful to the economy (Iriondo and Pérez-Amaral, 2013). The inefficient allocation of educational resources will constrain the development of the economy in the future and thus the economic value of education will be questioned. In addition, some tax-revenue is wasted as it is used for investing in non-productive education (McGuinness, 2006).

In terms of individuals who are overeducated, this suggests that their private investment on education is less productive than that of people who are correctly educated and they will incur an opportunity cost for non-productive investment in education. Overeducation can also bring negative impacts on individuals' health status and work expectations (Tsang and Levin, 1985); (Johnson and Johnson, 2000).

In addition, overeducation is a serious concern for organisations, because overeducation is found to be linked with low job satisfaction (Tsang and Levin, 1985), a high rate of absenteeism and high turnover rates (Sheppard and Herrick, 1972). As a result, production costs of companies may increase due to the reduced work effort of overeducated employees, which implies that there should be a negative relationship between overeducation and productivity. That is to say, overeducated people may behave in counterproductive ways. Considering the potential costs of overeducation, firms may avoid employing overeducated candidates (Tsang and Levin, 1985).

Within the literature, it is found that immigrants are more likely to be overeducated than their native counterparts, which has been confirmed in the United States (Chiswick and Miller, 2009a), UK (Lindley, 2009), Denmark (Nielsen, 2007), New Zealand (Poot and Stillman, 2010) and some European countries (Tijdens and van Klaveren, 2011). Less-than-perfect international transferable human capital and labour market discrimination are two important reasons to explain the phenomenon of overeducation between immigrants and natives (Chiswick and Miller, 2009a). The exploration of over-education of international immigrants is an important branch in the overeducation literature, which is discussed in more detail in Chapter 4.

1.2 Aims and structure of the Thesis

Overeducation is an important topic in the education and labour economics area. According to the literature, the appearance of overeducation is related to higher education expansion, especially in the USA, UK and some European countries (see Chapter 2). China has also experienced a large scaled higher education expansion and similar graduate employment situations. However, due to different education systems, labour market structure and distinct levels of economic development, overeducation in China may exhibit different patterns from those foreign countries in the west and have implications for China, which we wish to explore in detail. This thesis aims to explore whether empirical patterns of overeducation can be demonstrated in the Chinese labour market and to investigate what lessons can be learnt from the empirical analysis to shed some light on the further development of the labour market and education system in China. The following three chapters focus on three unique perspectives to explore overeducation in the Chinese labour market.

Chapter 2 examines the extent, determinants and wage effects of overeducation in the Chinese labour market based on a longitudinal analysis, which enables us to have a general understanding of the phenomenon of overeducation in China. Dramatic changes occurred in the labour market and education system in the past thirty years in China, thus an investigation of wage returns to overeducation by age groups and over time is also conducted. Due to the longitudinal feature of the dataset used, unobserved heterogeneity is taken into consideration to explore the wage effects of overeducation.

Considering possible negative impacts of overeducation on productivity, Chapter 3 investigates relationships between educational mismatch and overall job satisfaction and aspects of job satisfaction as well. This chapter enables us to explore whether overeducated individuals show discontent towards their “whole job” or only some aspects of their jobs. In addition, we introduce a skill mismatch variable into the analysis to differentiate between corresponding impacts of educational mismatch and skill mismatch on job satisfaction and aspects of job satisfaction.

Motivated by “Hukou” system and the increasingly important role of rural-to-urban migrant workers in the urban labour market[5], Chapter 4 investigates wage effects of overeducation for rural-to-urban migrant workers. Considering the generational heterogeneity between the rural-to-urban migrant groups, wage returns to education and wage effects of educational mismatch of the old and new generation of migrant workers are first examined. A comparative study of wage effects of educational mismatch between rural-to-urban migrant workers and urban residents in China is conducted thereafter.

At the end of this thesis, Chapter 5 presents a summary of findings obtained from this thesis, followed by concluding policy implications and research limitations.

1.3 Research questions

Building on the existing literature and relevant background of China, this thesis will examine three questions with sub-questions in each question as follows:

Chapter 2 (Research question 1): What are the empirical patterns of overeducation in the Chinese labour market based on a longitudinal analysis?

(1) What extent of overeducation exists in China?

(2) What are the determinants of overeducation in the Chinese labour market?

(3) What wage effects of overeducation can be observed in the Chinese labour market under the following circumstances?

  a. By age groups (Post-Mao and Mao)
  b. Time effects (over time)

[5] A detailed description of Hukou system in China is provided in section 4.2.

c. Controlling for unobserved heterogeneity

Chapter 3 (Research question 2): What are the relationships between educational mismatch (overeducation and undereducation), skill mismatch and job satisfaction?

(1) Does educational mismatch reduce overall job satisfaction and if so, does the same relationship apply to different aspects of job satisfaction?

(2) Does skill mismatch or educational mismatch play an important role in explaining individuals' job satisfaction?

Chapter 4 (Research question 3): What are the wage returns to education and the wage effects of educational mismatch between the new and old generation of migrant workers, and between rural-to-urban migrant workers and urban residents?

(1) Are there any differences in wage returns to education between the new and old generations of migrant workers?

(2) What is the incidence of educational mismatch among rural-to-urban migrant workers?

(3) What are the wage effects of educational mismatch between the new and old generation of migrant workers?

(4) Are there any differences between rural-to-urban migrant workers and urban residents in terms of the incidence of overeducation and wage returns to overeducation?

1.4 Summary of datasets and methodology

In order to answer the questions above, three large scaled datasets in China are employed in this thesis, which are the China Health and Nutrition Survey (CHNS) 1989-2009, the Chinese General Social Survey (CGSS) 2008 and the Rural-Urban Migration in China (RUMiC) 2009. The China Health and Nutrition Survey (CHNS) 1989-2009, which is a panel data, enables us to conduct a longitudinal analysis of overeducation in the Chinese labour market to answer research question 1 in Chapter 2. The Chinese General Social Survey (CGSS) 2008 is a cross section dataset that can be used to explore question 2 in Chapter 3. The Rural-Urban Migration in China (RUMiC) 2009 is employed to answer question 3 in Chapter 4. In addition, a variety of methodologies are applied to facilitate the empirical analysis in this thesis, which are the Ordered Probit Model, Pooled OLS Regression, Fixed Effects Model, Random effects Model, OLS Regression and Quantile Regression (QR). Table 1-1 presents a summary of all the research questions, datasets and methodology used in this thesis.

Table 1-1 Summary of research questions, datasets and methodology

Research questions	Chapter	Data	Methodology
1. What are the empirical patterns of overeducation in the Chinese labour market based on a longitudinal analysis?	Chapter 2	China Health and Nutrition Survey (CHNS) 1989-2009 (Panel dataset)	(1) Ordered Probit Model (2) Pooled OLS Regression (3) Fixed Effects Model (FE) (4) Random Effects Model (RE)
2. What are the relationships between educational mismatch (overeducation and undereducation), skill mismatch and job satisfaction?	Chapter 3	Chinese General Social Survey (CGSS) 2008 (Cross section)	(1) Ordered Probit Model
3. What are the wage returns to education and the wage effects of educational mismatch between the new and old generation of migrant workers, and between rural-to-urban migrant workers and urban residents?	Chapter 4	Rural-Urban Migration in China (RUMiC) 2009 (Cross section)	(1) OLS Regression (2) Quantile Regression (QR)

1.5 Contribution of the Thesis

There are three significant contributions of this thesis to the overeducation literature in China. Using the China Health and Nutrition Survey (CHNS) 1989-2009, a longitudinal analysis of the overeducation in the Chinese labour market is conducted in Chapter 2. Previous studies of overeducation in China all use cross-sectional data, which do not take time effects and unobserved heterogeneity into consideration. This longitudinal analysis can be used to test whether empirical results obtained from the cross sectional data are robust when taking time effects and unobserved heterogeneity into consideration.

Second, in comparison to other fields of overeducation research, there is currently no study that explores the relationship between educational mismatch and job satisfaction in China. Due to the rich data information in the Chinese General Social Survey (2008), not only the relationship between overall job satisfaction and overeducation can be explored, the impact of overeducation on satisfaction with salary, welfare, workload, working conditions and facilities, the relationship with colleagues, the relationship with the boss, commuting distance to job location and housing benefits also can be examined in Chapter 3. In addition, we first treat educational mismatch and skill mismatch separately to analyse their corresponding effects on overall job satisfaction as well as various specific aspects of job satisfaction, which adds considerably to the overeducation literature in China.

Finally, Chapter 4 contributes to the existing literature on the education of migrant workers by taking the generation of migrant workers into consideration. Moreover, this chapter is the first to extend the overeducation literature to the analysis of educational mismatch between the old and new generation of migrant workers and between rural-to-urban migrant workers and urban residents in China, which is also a contribution to the overeducation literature in China.

Chapter 2 A longitudinal analysis of overeducation in China

2.1 Introduction

Overeducation is an important topic in the education and labour economics area, which has received attentions in many countries. Freeman (1976) first proposed the word "over-education" in his book *The Overeducated American.* Due to the increasing college enrollment rates of the new generation “baby-boomers” in the USA, the wage returns to schooling decreased sharply in the late 1960’s and continued to fall through the 1970’s, which raised the notion of overeducation. This phenomenon had attracted many U.S. economists to investigate it (Duncan and Hoffman, 1981); (Rumberger, 1981); (Tsang and Levin, 1985); (Tsang, 1987); (Sicherman, 1991); (Cohn and Khan, 1995); (Daly et al., 2000). In the UK, the government suggested that they would promote a college expansion policy for all under 30s in order to benefit from a more educated labour force, which gave rise to the emergence of overeducation (McGuinness, 2006). According to Dolton and Vignoles (2000), the number of college enrollments in the UK increased by 42% from 1981 to 1991.

Since the 1980s, the European countries (EU) have made heavy investments on education resulting in a significant higher education expansion (Iriondo and Pérez-Amaral, 2013). According to Eurydice (2012), about one third of the population holds a higher education degree in the EU. The number of students enrolled in higher educational institutions has almost tripled between 1975 and 2009 and it climbed up to 19.5 million in 2009 (Eurydice, 2012). Although the demand for highly educated people increased, there were still about 20% of the population working in low level jobs which didn’t need a higher education degree in 2010 (Iriondo and Pérez-Amaral, 2013).

At the same time, many developing countries, like Pakistan, India and Mexico, have also witnessed the phenomenon of overeducation due to an increase in the average educational attainment (Abbas, 2008); (Quinn and Rubb, 2006). However, overeducation has different implications in developing countries where incomes are low, education expansion is at a rapid speed from a lower base and higher education institutions vary considerably in quality (Mehta et al., 2011).

In 1998, the Chinese Ministry of Education (MoE) issued the *Action Plan of Education Promotion for the 21st Century* to begin the journey of a nation-wide higher education expansion aiming to transform from an "elite higher education system" to "mass higher education" in China. Trow (1973) argues that the enrollment rate of higher education that is above 15% can be called "Mass higher education", which is also the goal set by the Chinese government to achieve by 2010. However, China expanded its higher education more rapidly than expected since 1999 and it had achieved this goal in 2002, which is eight years earlier than planned (Bai, 2006). According to the Chinese statistical database, college enrollment in 1999 was 1.55 million, and the number of new students enrolling in higher education was 4.47 million in 2004, 5.04 million in 2005 and 6.08 million in 2008. Up to 2011, the number had already climbed to 6.82 million, which is four times greater than that in 1999. As a result, a large number of graduates flowed into the labour market. However, was China ready to accept this condition of mass higher education?

Judging from the current economic and social environment, the answer may be "no". Although the average growth rate of GDP in China has been over 10 per cent annually since 1999, it still cannot keep pace with the fast growth rate of the education expansion, which has averaged around 16 per cent[6]. In addition, the labour market is not fully adjusted with the transition of economic structure (Li and Zhang, 2010). Thus, the labour market couldn't offer enough places to absorb and allocate the ever increasing supply of graduates. Considering the severe employment situation in the Chinese labour market and in order to escape from unemployment or hoping to find a better job in the future, more graduates would choose to acquire a higher education degree by continuing their studies, which increases the average level of education. The trend of acquiring a master's and or a doctoral degree has become more popular in recent years (Bai, 2006). In addition, some graduates would accept non-graduate jobs that are not matched with their education and expectations to make a living (He and Mai, 2015). Both these two situations give rise to the appearance of "overeducation" in the Chinese labour market.

In addition, many new college entrants in the labour market find it difficult to secure their expected level job compared to graduates who entered the labour market in the

[6] See Table A1 in the appendix.

1990s holding the same qualification (Bai, 2006). Put differently, the higher education degree may no longer be an important signal of high ability as before. Although more graduates have acquired higher education qualifications, the quality of the higher qualification has been criticized by many researchers (Bai, 2006); (Wan, 2006); (Tan, 2013). On the other hand, due to the college expansion, many universities and colleges have more students than before so that the distribution of ability of students has been expanded. Some unqualified students can have the chance to gain access to higher education, especially in those newly opened three-year colleges (He and Mai, 2015). Low ability is one of the reasons causing people to be overeducated (Hartog, 2000).

Under the above conditions and also undergoing similar large scaled higher education expansion as the UK and European countries, what extent of overeducation exists in China? What are the determinants of overeducation in the Chinese labour market? Will the empirical patterns of wage effects of overeducation in the literature be presented in the Chinese labour market when taking time effects and unobserved heterogeneity into consideration?

In order to answer these questions, the China Health and Nutrition Survey (CHNS) 1989-2009 is used to make a longitudinal analysis of overeducation in the Chinese labour market, which is a contribution to the overeducation literature in China. Previous studies of overeducation in China all use cross-sectional data, which do not take time effects and unobserved heterogeneity into consideration. In this chapter, I employ a variety of techniques to analyse the extent of overeducation, the determinants of overeducation and the wage effects of educational mismatch in various aspects in China.

The remainder of the chapter is arranged as follows. A comprehensive description of labour market reform and the educational system reform in China are presented in Section 2.2. Section 2.3 provides a detailed summary of the literature related to this topic. In Section 2.4, I will explicitly introduce the data and econometric methods. Section 2.5 explores the determinants of overeducation and wage effects of overeducation in the Chinese labour market. The conclusion and implications are presented in Section 2.6.

2.2 Background

2.2.1 The country

China, located in East Asia, is the most populous country in the world. According to the Chinese statistical database, the total population was over 1.37 billion at the end of 2014. China is also the second largest country in the world in terms of land area, covering 9.6 million square kilometres. It has international borders with 15 countries. In addition, the Communist Party is the founding and the only ruling party in China. According to the International Monetary Fund (IMF), the growth rate of real GDP increased on average 10% from 1979 to 2014 (See Figure 2 in section 1.1.1). The World Bank reports that China is now the second largest economy in the world, based on the total amount of the Gross Domestic Product (GDP) and has helped more than 500 million people in its own country out of poverty. At the same time, China is also the world's largest manufacturer and exporter, and holds the maximum amount of foreign exchange reserves in the world (Morrison, 2013).

2.2.2 Labour market reform in China

Before 1978

Before the war fighting against Japan in 1937, China had a domestic-ownership predominated economy with the modest development of communications, transportation, banking and finance sectors, commercialized agriculture and well-functioned labour market with free mobility across regions (Brandt and Rawski, 2008). However, the eight-year full-scale war against Japan and the following civil war between the Communist party and Kuomintang resulted in an economy with inflation and recession. Since 1949 with the establishment of the People's Republic of China, a Soviet economic development model was adopted by the government directly in order to help China recover smoothly from the ravage of continuous war. Under the Soviet model, a planning system controlled by the government was applied. That is to say, the state makes all the economic decisions and production decisions rather than through market forces. For example, the government set the prices of all the input and output and the assignment of labour force and industries distribution are controlled by the state.

Under the centrally-planned economy, assignment of workers to enterprises was in the hand of government, who controlled all the matches between jobs and employees. The allocation of labour force was referred to employment quota assigned by the State Ministry of Labour and Personnel rather than education and other kinds of human capital. The quota was firstly allocated to each province and city. Then jobs were allocated to individuals who needed a job through a particular school and local communal offices. In this case, individuals were not allowed to find jobs by themselves and enterprises were not permitted to recruit freely. To some extent, there was no real 'education and job match'. Moreover, employment was for lifetime and both geographical and occupational mobility were restricted. In addition, the government determined and controlled the wages of all workers through a grade system, which was designed on seniority rather than promoting productivity and innovation (Zhang et al., 2005). In this case, wage differentials between different occupations were compressed to a small extent. Even sometimes, unskilled workers may have equal or higher wages than skilled workers or professionals, which is called wage compression. This wage setting system has been criticised as reducing workers' incentives and leading to low productivity and a large number of redundant labour (Knight and Song, 1995).

After 1978

With the end of the Cultural Revolution (CR) in 1978, in order to alter the low productivity and misallocated resource in the society under the centrally-planned system, the new leadership of Deng Xiaoping began to reform the economy from a centrally-planned system to a market-oriented economy. In terms of the labour market, "*Resolution on Economic Institutional Reform*" was passed by the Communist Party in 1984 to use a floating wage system to replace the previous wage quota system, which allows firms to pay flexible wages and bonus based on worker's real productivity. In 1986, "*Temporary Regulations on the Use of Labour Contract in State-Run Enterprises*" was issued by the State Council firstly to introduce the labour contract system to the Chinese labour market. Since then, the percentage of employees holding a labour contract increased from 13 per cent in 1990 to 30 per cent in 1995. Under the labour contract system, firms have the freedom to choose the most suitable workers by themselves, which increases the mobility of labour and competition for productive workers. In turn, employees can also compete for jobs according to their education and work experience. At the same time, lifetime employment was ended by the application of labour contract in the Chinese labour market (Zhang et al., 2005).

In the early 1990s, losses from the state-owned enterprises (SOEs) had become severe because of the less-incentive wage setting system in the SOEs and the full-employment goals set by the government. Over 40 per cent of SOEs were reported to have a profit loss (Meng, 2012). In 1994, the government issued a policy to allow the privatisation of small and medium SOEs, which is known as the "*seizing the large and letting go of the small*". This policy aimed to protect 1000 large-scale state-owned enterprises and permit those loss-making small and medium SOEs to go bankrupt and dissolve. In response to this privatisation policy, some SOEs began to dismiss workers. However, this process was tightly controlled and limited by the government. In 1997, due to the fact that massive and ever increasing financial losses couldn't be controlled in the SOEs, the state finally decided to break the "iron rice bowl", a lifetime and guaranteed employment of Chinese urban workers, to begin the reconstruction of the SOEs within four years from 1997 to 2000 (Yueh, 2004). As a result, approximately 12 million workers from SOEs had been laid off between 1997 and 1998. Although an increased unemployment rate and decreased labour force participation in the Chinese labour market were observed, this reconstruction led to a significant rise of employment in the private enterprises (Zhao, 2002). In order to relieve the unemployment problem of those laid-off workers from the SOEs (*Xiagang*), the government created reemployment centres to provide job training and job searching assistance to laid-off workers. In addition, reemployment centres also provided laid-off workers up to three years minimum living subsidies, which included pension and health care benefits (Cai et al., 2008). The reconstruction of the SOEs was completed in the March 2005 and all the reemployment centres had been closed. Since then, laid-off workers from SOEs were registered as unemployed workers.

2.2.3 Education reform in China

In order to keep up with the changes in economic development, the education system in China also had experienced a series of changes and reforms. The historical course of educational reform is now outlined.

Mao's education 1949 -1978

After abandoning the civil service examination system at the beginning of the 20th century, China decided to adopt the American model to build its modern school system in 1922 and this model had been used until 1949. The American model refers to a 6-3-3-

4/5 structure, which contains six years of primary school, three years of junior middle school, three years of senior middle school and four or five years of university education (Deng and Treiman, 1997). Since the Chinese Communist Party (CCP) came to power in 1949, the Soviet Union's educational model was adopted by the government, in which the state was in charge of all the issues regarding education. This included constructing all educational institutions, the school system, changing all the private schools to public schools and designing a unified teaching syllabus and textbooks. The education system in the Soviet Union's model has a 5-5-4 structure, which consists of five years of primary school, five years of secondary school, and four years of university (Deng and Treiman, 1997). In 1951, the Ministry of Education decided to accept the Soviet Union's model as the basic Chinese education system. However, it was not widely accepted by the public. Most schools still applied the old 6-3-3-4/5 school system (Deng and Treiman, 1997). From 1958 to 1965, the Chinese leader Mao Zedong decided to discard the Soviet Union's model and build an educational system with Chinese characteristics. This new system in China consisted of five to six years primary school, two or three years of lower middle school, two or three years of upper middle school and four years of university. In addition, all the tuition and fees of boarding and lodging of higher education were entirely covered by the government. The government also provided living stipends to students who came from rural areas and poor families (Zhang et al., 2005); (Sun, 2010).

Another important phase of educational reform before 1978 is the "Cultural Revolution", which lasted from 1966 to 1976. The "Cultural Revolution" was directed by Mao Zedong and his agents to eliminate differences between urban and rural, worker and peasant and mental and manual labour (Sun and Johnson, 1990). During the Cultural Revolution, production became stagnated. All kinds of secondary schools were shut down in 1966-1968 and universities were closed down entirely from 1966 to 1972. Thousands of young urban workers and students were allocated to the countryside to work as peasants. It seems that the "Cultural Revolution" had a huge impact on the Chinese education history (Cai et al., 2008).

After 1978

In order to adapt to a market-oriented socialist economy, China began to restore its education system. The new leader Deng Xiaoping emphasised the importance of education to the nation's development and put forwarded a "three orientations" guidance for education in China that education in China should satisfy the needs of modernisation, the world and the future (Wang, 2002). In 1979, the national university entrance examination was restarted, which was open to all persons less than 30 years old. The authorised education system was regulated into 6-3-3-4 structure, that is, six years of primary school, three years of junior high school, three senior high school and four years of university. In addition, senior high school was divided into an academic part and an vocational part (Hannum and Xie, 1994). In 1985, the government announced the *Decision on Education Reform* that they would give more autonomy to the local government and higher education institutions to build a multi-functional university system, like teaching, research, business and social services (Bai, 2006). In 1986, the government announced the *Compulsory Education Law of the People's Republic of China*, which officially sets the nine-year compulsory education. In 1993, according to the *Guidelines for China's education reform and development*, the "user-pays" system of student tuitions in higher education began to apply in China. That is to say, university or college students now have to pay fees for the higher education and the government would not provide the free higher education to the public. Moreover, the centrally-planned job assignment system was abolished. College graduates had to find jobs after their graduation by themselves. The government would not assign jobs to graduates any more (Li et al., 2014).

In order to relieve the unemployment problem brought by the Asian financial crisis and the reconstruction of the state-owned enterprises (SOEs), the Chinese government put forwarded a proposal "*A consideration of Effective Approaches to stimulate China's Economy*" to put college educational expansion on the calendar initially in 1998. There are mainly three reasons behind the policy of higher education expansion listed on the proposal: (1) Household consumption could be increased by 100 billion, which is approximately equivalent to 0.5 per cent of China's GDP growth rate per year; (2) It can improve the nation's human capital level and its competitiveness to the future development. (3) The unemployment problem can be eased by putting more college graduates into schools rather than the labour market (He and Mai, 2015).

In late 1998, the Chinese Ministry of Education (MoE) issued the *Action Plan of Education Promotion for the 21st Century* to begin the journey of nation-wide higher education expansion. Three priorities are addressed in this official document, which includes increasing the college enrollment rate by 25 to 30 per cent per year, improving the student-teacher ratio, and adding investment on higher education. Therefore, in response to the government policy, the number of college enrollment increased massively from 1.55 million to 5.05 million between 1999 and 2005 and the growth rate of college enrolment before 2006 are all above 10 per cent (See Table A1 in the appendix). After 2006, although the growth rate of college enrollment was lower than 10 per cent, the total number was still climbing. In 2014, the number of college enrollments was 7.21 million, which is almost five times higher than that in 1999 (See Table A1). According to the *National Outline for Medium- and Long-Term Reform and Development (2010-2020)*, the total number of college enrollment is aimed to expand to 33 million (He and Mai, 2015). Based on this official document, it seems that the journey of higher education expansion will last in the future and there is still a long way to go to achieve the mass higher education in China compared to developed countries, like the UK (the enrolment rate of higher education is around 70%)[7].

2.3 Literature Review

2.3.1Definition of overeducation

Overeducation can be defined in various ways. A commonly used definition of overeducation is that if an individual's educational attainment exceeds the normal requirement of his job, he or she is estimated as overeducated (Duncan and Hoffman, 1981). In turn, undereducation can be constructed when an individual's educational attainment is less than the normal requirement of his job. It also can be described into three ways: the first one is that there is a decline in one's economic status to certain education level relative to people who have same education qualification in the past (Tsang and Levin, 1985). The second is that one's actual job condition is not consistent with his expectations (Tsang and Levin, 1985). The third one is that educational skills owned by workers are greater than the requirement of their jobs (Rumberger, 1981). Chevalier (2003) argues that above definitions of overeducation are all based on the assumption that graduates are homogeneous in their skills. He put forwards a unique explanation about overeducation that graduates in non-graduate jobs but are satisfied

[7] Figure is from Blanden and Machin (2004).

with their jobs are treated as *apparently overeducated*, while those who are not satisfied their jobs are called *genuinely overeducated*. This definition makes an explicit classification of overeducated people and we can explore the impact of overeducation among overeducated groups taking unobserved heterogeneity into consideration.

2.3.2 Measurement methods of required education

Within the literature on overeducation, one of the core issues is how to measure the amount of required education. There are three different ways to determine the required education. The first method is known as job analysis (JA): acquiring systematic evaluation about schooling required for a particular job from professional job analysts. The most commonly adopted job evaluation is the Dictionary of Occupational Titles (DOT) issued by the US Employment Service (Battu et al., 2000). The DOT contains detailed information about the required educational qualifications and types of education for particular occupations. Many scholars apply this method for empirical investigation (Rumberger, 1987); (Hartog and Oosterbeek, 1988); (Van der Meer, 2006). The second measure is from a worker's self-assessment (WA): workers make subjective evaluations by themselves to determine the required schooling for their jobs. That is to say, employees can directly point out the required level of education for their occupations. For example, The Panel Study of Income Dynamics (PSID) in USA contains a question "How much formal education is required to get a job like yours?" (Sicherman, 1991). The National Graduates Survey (NGS) in Canada uses the question "What was the level of education needed to get the job you had last week?" (Frenette, 2004). After answering these kinds of questions, workers can compare their actual educational attainment with the required educational level of their occupation to determine whether they are overeducated, exactly educated or undereducated. Alba-Ramirez (1993), Battu et al. (2000), Duncan and Hoffman (1981), Dolton and Vignoles (2000), Dolton and Silles (2008), Green et al. (2002) and Korpi and Tåhlin (2009) all adopt WA method to make empirical analysis. The third method is called Realised Matches (RM), which was proposed by Verdugo and Verdugo (1989) and Kiker et al. (1997). Verdugo and Verdugo (1989) define required education as the mean level of schooling within an occupation. Workers are considered to be adequately educated if their actual education falls within one standard deviation range around the mean level of schooling and overeducated if their actual education is greater than one standard deviation above the mean level of education for a specific occupation or undereducated if their actual education is more than one standard deviation below the mean level of education, which is also called the VV method. Kiker et al. (1997) deem that the modal level of education should be a better measurement instead of the mean level of education to measure required education. They define that workers are considered to be adequately educated if their actual education level is equal to the mode level of education within their specific occupations. Overeducated (undereducated) workers can be expressed as their actual education attainments are higher (lower) than the mode level of education within their occupations. This method was adopted by Bauer (2002), Groot (1996), Hung (2008), Kiker et al. (2000), Rubb (2003) and Voon and Miller (2005). It should be noted that JA analysis and RM method are in objective perspectives while WA is based on a subjective view.

The above three methods all have their advantages and drawbacks. None of these three methods is exempt from criticism. In terms of the JA method, the information about required educational level for specific occupation from the job analysts might not be updated with the society and technological change (Chevalier, 2003). If classifications in JA cannot be adjusted timely, estimated results may be biased (Verhaest and Omey, 2006). Halaby (1994) argues that if the classification of job is defined on a more aggregate level, some jobs in one occupation that might have different required educational levels but are estimated to have the same required years of schooling. However, Hartog (2000) argues that a systematic and comprehensive JA should not make any bias to define required educational levels for specific occupations with regularly updated job classifications. He suggests that JA would be the best option to measure required education.

Compared to the JA method, the worker's self-assessment (WA) method is more cost efficient to conduct in practice and the classification of job in WA is more particularized and in line with the actual conditions of the labour market. However, in the WA method, researchers might not know the process of judgment made by workers. Workers might exaggerate the education requirement of his/her job due to vanity. Moreover, WA may have cohort effects. That is to say, workers may decide the required educational level of their occupations depending on their colleagues' 'educational attainment'. It is sensitive to the observed distribution of education for a given occupation (Chevalier, 2003). In addition, Hartog (2000) argues that the WA method may be influenced by the hiring requirement of newly hired workers, which is prone to make upward biased estimation of required educational levels. Additionally, Dolton and Silles (2008) highlight that we should tell the difference between the requirement of "to get" and "to do" the job in WA methods, as it is an important and serious problem when using education as a screening criterion to identify workers' ability.

The RM method is determined by the actual distribution of educational attainment of employees within specific occupations. The mode index can avoid interference effects, exclude the outliers, and is also less sensitive to the technological change (Kiker et al., 1997). However, RM might make unreliable estimates in some cell size occupations and choosing one standard deviation in VV method has no regulations to follow (Bauer, 2002). In practice, the principal of choosing measurement methods is based on the relevant data availability (Hartog, 2000).

2.3.3 Incidence of overeducation

2.3.3.1 Incidence of overeducation by methods

The incidence of overeducation is influenced by the measurement method we use to define required educational level. Therefore, different methods to measure overeducation may yield different results of incidence of overeducation. Groot et al. (2000) employ the meta-analysis methodology based on 25 studies on overeducation to identify patterns of incidence of overeducation using different measurement methods to define required education. According to Groot et al. (2000), the incidence of overeducation across different studies is in the range between 10% and 40%. The average incidence of overeducation based on the Realised Matches method is 13.1% and the average incidence of overeducation using worker's self-assessment method is about 28.6%. In addition, Groot et al. (2000) suggest that the using realised matches method yields the lowest estimation of the incidence of overeducation, while the highest estimation of the extent of overeducation can be obtained from the worker's self-assessment method. Based on the summary of the existing studies on overeducation, McGuinness (2006), Tsai (2010) and Leuven and Oosterbeek (2011) all find that the realised matches method (the mean index) finds lower incidence of overeducation than the method of self-report or analysis from professional job analysts. Since the range of correct education become larger with extended two standard deviations in the mean index, thus researchers who follow Realised Matches method may get lower estimate of overeducation. Higher incidence of overeducation obtaining from the JA method may due to the obsolete information of required education in each job category.

2.3.3.2 Incidence of overeducation across countries

The exploration of overeducation has been conducted in many countries due to the worldwide higher education expansion. Because of different structures of the labour market and education systems, the incidence of overeducation varies across countries (Allen and De Weert, 2007). Hartog (2000) conducts a summary from existing studies on overeducation in five countries: Netherlands, Spain, Portugal, UK and USA. According to Hartog (2000), the incidence of overeducation is approximately around 25% among the five countries and a proper match is about 60%. USA has the highest incidence of overeducation and Netherlands has the lowest incidence of overeducation. Duncan and Hoffman (1981) estimate that the incidence of overeducation in the USA in 1976 is 42% using the self-assessment method. Cohn and Khan (1995) and Rumberger (1987) report the incidence of overeducation in the USA are 33% and 40% respectively. In the UK, the level of overeducation varies from 11% (Groot, 1996) to 38% (Dolton and Vignoles, 2000). Bauer (2002) suggests that the incidence of overeducation in Germany is 12% and 31% based on the mean and mode index respectively. Kiker et al. (1997) employ three methods to calculate incidence of overeducation in Portugal (VV-9.4%; RM-25.5% and JA-33.1%). Up to date, the latest estimated incidence of overeducation in the OECD area is about 25% and the proportion of undereducated workers is 33% (Quintini, 2011).

Compared with developed countries, the exploration of overeducation is relatively scarce in developing economies[8]. In Mexico, Quinn and Rubb (2006) find that the incidence of overeducation is 17.2% in the mean index, while based on the mode index, the incidence of overeducation increases to 40%. According to Zakariya and Battu (2013), the incidence of overeducation is 32% using the work's self-assessment method in Malaysia. In Hong Kong, about 37% of males are estimated as overeducated and the incidence of overeducation for females is 31% in 1991 in the mode index (Cohn and Ng, 2000).

[8] Lack of data is the main reason (Mehza et al., 2011).

2.3.3.3 Incidence of overeducation in China

With the rapid higher education expansion in China after 1999, the phenonmenon of overeducation has attracted attention from scholars. Yang and Yue (2005) estimate the incidence of overeducation (21%) based on the self-report method using survey data funded by the Ministry of Education of China collecting from 45 universities in China in 2003. Mayston and Yang (2008) examine overeducation for graduates. They use the self-assessment method to define required education using the data from the Research Center for the Economics of Education at Peking University in June 2003. According to their results, 20.5% of graduates across China consider themselves as overeducated. This figure is close to the result of Yang and Yue (2005), which uses data in the same year. Ren and Miller (2012) suggest that the percentage of correctly matched worker is 45.7% and the incidence of overeducation is 27.3% in rural China. In addition, the percentage of overeducated males is 37.5% and the incidence of overeducated females is 24.9%.

Wu (2008) argues that in governments, monopolised industries and developed areas, the incidence of overeducation is higher than others (enterprises, competitive industries and less developed areas). Mayston and Yang (2008) also investigate the incidence of overeducation across academic programs and subjects. According to their results, PhD graduates are reported to have the highest rate of overeducation (42%), and are followed by the master level (35.8%). College Diploma graduates are estimated to have the lowest incidence of overeducation (12.9%). In terms of subjects, Mayston and Yang (2008) point out that Agriculture graduates have the highest incidence of overeducation (28.1%) and Art graduates have the lowest overeducation rate in China (17.1%).

2.3.4 Wage effects of overeducation

In the empirical analysis of the relationship between education and wages, Mincer (1974) firstly proposes the Mincer wage equation, which is widely used as a tool to estimate the wage return to education and is described as follows:

$$\ln W_{it} = \beta X_{it} + \alpha_1 S_{it} + \alpha_2 E_{it} + \alpha_3 E_{it}^2 + \mu_{it} \qquad (1)$$

where E_{it} is years of working experience at time t and E_{it}^2 is experience squared. α_2 and

α_3 should be positive and negative respectively. S_{it} is the actual years of schooling at time t. α_1 is the estimation of the return rate to schooling and is assumed to be constant in different educational levels. μ_{it} is a residual with zero mean and a normal distribution. X_{it} contains a vector of individual and socio-economic characteristics.

However, Duncan and Hoffman (1981) argue that economic effects of surplus education and deficit years of schooling are different. They decompose an individual's educational attainment into the number of years of required education, years of surplus education and years of deficit education to form a new model, which is called ORU specification (Overeducation-Required Education-Undereducation). This model is defined as follows:

$$\ln W_{it} = \rho X_{it} + \theta_1 S_{it}^{r} + \theta_2 S_{it}^{o} + \theta_3 S_{it}^{u} + \mu_{it} \qquad (2)$$

Where $\ln W_{it}$ is the natural logarithm of average monthly wages at time t and the actual completed education S_{it} in equation (1) is classified into S_{it}^{r} (required years of schooling in the job), S_{it}^{o} (years of surplus education) and S_{it}^{u} (years of deficit education), where:

$S_{it} = S_{it}^{r} + S_{it}^{o} - S_{it}^{u}$
$S_{it}^{o} = S_{it} - S_{it}^{r}$ if $S_{it} > S_{it}^{r}$
=0, otherwise
$S_{it}^{u} = S_{it}^{r} - S_{it}$ if $S_{it} < S_{it}^{r}$
=0, otherwise

and μ_{it} is an error term and has a normal distribution. X_{it} is a vector of individual and socio-economic characteristics. In this model, the bench mark group consists of individuals who are in the same occupation with overeducated people and undereducated people but are correctly educated.

According to a strand of findings using equation (2), an additional year of schooling beyond the required education has positive economic value, i.e $\theta_2>0$. In addition, the return to one year of required education is higher than the wage return to one year of surplus schooling ($\theta_1>\theta_2>0$). However, the wage return to one year of deficit schooling is negative ($\theta_3<0$). Although the wage return to undereducation is negative, its absolute value is smaller than wage returns to required education and wage returns to overeducation. This model is used to compare wage effects of overeducated / undereducated workers with individuals who have the required education working in the same job. Rumberger (1987), Sicherman (1991) and Daly et al. (2000) deploy this model to explore wage effects of overeducation in the United States. Results are also available in other countries, such as the United Kingdom (Dolton and Vignoles, 2000); (Groot and Maassen Van Den Brink, 2000); (Lenton, 2012), Portugal (Kiker and Santos, 1991), Spain (Alba-Ramirez, 1993), Sweden (Korpi and Tåhlin, 2009), Netherlands (Hartog and Oosterbeek, 1988), China (Ren and Miller, 2012). Hartog (2000) argues that the wage return to overeducation is about half and two-thirds of the return to required education. The estimated return to overeducation is always apparently significant while the returns to undereducation are not always statistically significant.

Verdugo and Verdugo (1989) propose a different model (VV model) from the ORU specification to explore the wage effects of overeducation and undereducation. They replace the required education by the actual education attainment in the ORU specification. In addition, they introduce two dummy variables instead of the exact years of surplus and deficit education into the equation to represent for overeducation and undereducation, which can be described as follows:

$$\ln W_{it} = \delta X_{it} + \gamma_1 CEDU_{it} + \gamma_2 OE_{it} + \gamma_3 UE_{it} + \varepsilon_{it} \tag{3}$$

Where $CEDU_{it}$ is the actual years of education and OE_{it} and UE_{it} are two dummy variables to represent overeducation and undereducation. OE_{it}=1 if people have surplus schooling than job requirements and UE_{it}=1 if they are estimated as undereducated. Overeducated and undereducated workers are compared with individuals who have the same years of schooling but are correctly educated. Based on empirical analysis, overeducated people have significant wage penalties for not fully utilising their education (γ_2<0) and undereducated workers have wage premiums, i.e (γ_3>0). Note that the values of γ_2 and γ_3 in this model are contrary to the coefficients of overeducation and undereducation in the ORU specification. Moreover, they have different implications to explain the wage effects of overeducation and undereductaion compared to the ORU specification (Cohn and Khan, 1995). Hartog (2000) argues that the coefficients of two dummy variables in the VV model cannot be compared to the wage return to actual education and the coefficient on the overeducation dummy variable simply indicates that overeducated people work in a lower level of job. Therefore, Hartog (2000) deemed that VV model would be less used in the empirical analysis in the future.

Among the existing literature on the wage effects of overeducation, two issues have been of frequent concern. One is unobserved heterogeneity and the other is measurement error. If some omitted variables are related to overeducation (undereducation) variables, such as ability, motivation and family background, which means that people are not assigned to educational mismatch randomly, OLS will have biased and inconsistent estimates. The other one is that due to the difference between two measurements of required education, there maybe someone who is estimated to be overeducated using the mean level method but not in the mode index method, which indicates possible measurement error.

2.3.5 Theoretical background of overeducation

In terms of theoretical explanations of overeducation, two aspects have been investigated by researchers, which are: 1. why overeducated people would accept jobs that require lower than their educational attainments? 2. Why employers would employ overeducated individuals? According to the existing literature, seven theories can be used to answer these two questions: (1) Human capital theory; (2) Search and match theory; (3) Career mobility theory; (4) Signaling; (5) Job competition theory; (6) Technological change theory; (7) Assignment theory. Among them, Human capital theory, Search and match theory and Career mobility theory can provide explanations to answer the first question. Signaling theory, Job competition theory and Technological change theory can be used to explain the second question. Assignment theory answers those two questions in an integrated perspective.

2.3.5.1 Human Capital Theory

According to the human capital theory, human capital, as a form of investment, consists of many components, such as formal schooling, on-the-job training and working experience (Becker, 1962). Sicherman (1991) suggests that there is a potential trade-off between education and other elements of human capital. These components can be substituted or compensated mutually in a given level of human capital. In this case, overeducated people may have less work experience or on-the-job training but they can use surplus formal education to substitute in order to gain a similar level of total human capital as workers who are matched in this job. While insufficiently educated people may take working experience or on-the-job training to compensate inadequate educational level. Alba-Ramirez (1993) and Kiker et al. (1997) all confirm this theory in empirical analysis.

2.3.5.2 Search and Match Theory

According to search and match theory, overeducation is attributed to imperfect information in the labour market. Workers who are new to the labour market may choose a job for which they are overeducated at the beginning of their career due to the lack of information about the labour market. With accumulated information and work experience in the labour market, they may shift to jobs that are matched with their educational levels. In this case, overeducation is a just temporary phenomenon. In terms of undereductaion, according to Hartog (2000), people will change jobs only when new jobs have higher ranked level (higher required educational levels). Therefore, the incidence of undereducation will increase with labour market experience.

2.3.5.3 Career Mobility Theory

Career mobility theory states that an individual may choose a job with a lower wage return to education but with a higher probability of promotion in the future than other available jobs with high wage effects of schooling (Sicherman and Galor, 1990). Sicherman (1991) further applied this theory to explain overeducation. Overeducated people are willing to choose a job for which their educational levels are higher than the educational level needed in the job in order to acquire skills or better opportunities to make a career upgrade in the future. However, this theory only takes effect if overeducated individuals indeed move to a higher level of job to fully utilise their educational qualifications (Nielsen, 2007). Based on the literature, this theory is unrealistic due to two reasons. One is the lack of empirical evidence. Sicherman (1991) finds that both overeducated people and undereducated people have a positive probability of promotion. Büchel and Mertens (2004) argue that overeducated people remain mismatched status within five years. The other reason is that this theory fails to provide a rational explanation in terms of undereducation.

2.3.5.4 Signaling

Spence (1973) argues that the labour market has asymmetric information. Employers are not completely sure about true productivity of employees when they make the employment decisions and even after hiring. There is a signal transfer mechanism passing the information about employees to employers in order to identify the most productive and motivated workers for firms. Education acts as one of important signals in this mechanism. Education is a screening device representing some unobserved personal characteristics, such as problem solving skills, communication skills and motivation. High educational levels signal high productivities. Therefore, in order to distinguish themselves from others, individuals will keep on investing in education. This theory can not only help firms reduce the cost of hiring, but also is beneficial for the final occupational distribution and placement in the labour market. If high returns of investment in education remain, incentives for investment in education will last long (Tsang and Levin, 1985). Based on this theory, overeducation may be a persistent phenomenon.

2.3.5.5 Job Competition Theory

Thurow (1975) postulates that the allocation of job is not determined by the educational level but is decided by job characteristics. For employers, they mainly focus on the minimum training cost of hiring a staff. The person who has the lowest training cost has the most possibility to stand at the head of the job queue. Training cost is judged by a set of individual characteristics, like educational attainment, working experience, work-related training and so on. Firms can take the level of education and other features as signals to rank people's position in the queue. Among these characteristics, education is a better evaluation criterion and brings more accurate expectations than others. The higher the educational attainment is, the lower the training cost. Thus, people will increase investment on education in order to get a higher rank in the job queue and increase the possibility to acquire the job comparing with other competitors. Therefore, the overall level of education in the job seeker queue will continuously climb. However, it is difficult for job structures to make quick reactions and adaptions to the ever changing supply of different skill groups. Thus in this model, overeducation is persistent as long as skill requirements of every job remain unchanged. Hartog and Oosterbeek (1988) and Sloane et al. (1999) employ econometric methods to verify this hypothesis.

2.3.5.6 Technological Change Theory

Kiker et al. (2000) argue that skills gained from school should be improved paralleling with the technological change. Labour market new entrants should have higher skills than those who engaged in the labour market earlier. Due to the positive adjustment costs, the replacement of recent better-educated labour couldn't be made in the short run. In the long run, firms may change their hiring standards and hire those better-educated individuals. Compared with their colleagues, those new entrants are more likely to be overeducated. In consideration of the rapid technological change and possible adjustment costs, it is better to retain overeducated people.

2.3.5.7 Assignment theory

Assignment theory states that the assignment of jobs considers both the demand side and supply side in the labour market. That is to say, job placement is allocated depending on the match between different characteristics of employees and heterogeneous requirement of jobs (Sattinger, 1993). Based on assignment theory, maximum productivity can be achieved when the most skilled workers are allocated to the most complex jobs and the least skilled workers work in the simplest jobs (Quintini, 2011). Overeducation can be explained by the imbalance between the supply of highly educated workers and the availability of current jobs in the labour market.

Several scholars have made efforts to confirm which theory can be better used to explain the existence of overeducation (Duncan and Hoffman, 1981); (Rumberger, 1987); (Dolton and Vignoles, 2000); (McGuinness, 2006); (Leuven and Oosterbeek, 2011). Based on the findings from above studies, the Assignment theory is a better candidate to explain the existing phenomenon of overeducation and its wage effects than other theories (McGuinness, 2006).

2.3.6 Determinants of overeducation

Most of studies focus on gender, experience and schooling to investigate the determinants of overeducation. Some studies implies that females are more prone to be overeducated than males (Frank, 1978); (Groot and Maassen Van Den Brink, 2000). The main explanation of this finding is that females are always restricted in the location of their spouses when searching for a job, which may make them more prone to be overeducated. However, according to Alba-Ramirez (1993), there is no significant result that indicates that overeducated workers are more likely to be females. Additionally, several findings confirm that males are more likely to be overeducated than females (Kiker et al., 1997); (Sloane et al., 1999); (Hung, 2008). Sloane et al. (1999) argues that men bear more financial burden than females to support family life and thus they have more need to accept a job that is lower than their educational level. In terms of experience, consistent findings imply that overeducated workers tend to be less experienced (Alba-Ramirez, 1993); (Kiker et al., 1997); (Sloane et al., 1999); (Hung, 2008), which confirms the human capital theory that overeducation is a compensation for other insufficient human capital to perform a job.

In terms of other determinants of overeducation, Sloane et al. (1999) find that individuals working in part-time jobs are more likely to be estimated as overeducated than workers in full-time jobs. Battu et al. (1999) argue that large employers are more likely to hire the most highly educated graduates, which may increase the possibility of making a good job-education match. In addition, Hung (2008) argues that workers in public sector are more prone to be overeducated than those in the private sector.

2.3.7 Longitudinal analysis of overeducation

According to the existing literature, most of the empirical analysis about wage effects of over-and undereducation are based on cross-sectional data and all individuals with a given educational qualification are treated as homogeneous. A potential problem using cross sectional data is the unobserved heterogeneity. An overqualified individual working in a job that requires less than his educational level might have lower ability. In this case, less able workers may find it hard to work in jobs that are commensurate with their educational qualifications. Therefore, controlling for unobserved heterogeneity is very important if the existence of innate ability causes educational mismatch (Bauer, 2002). Longitudinal data can avoid this problem to some extent. However, there are only a few studies conducting longitudinal analysis of the wage effects of overeducation.

Bauer (2002) employs a panel dataset, the German Socioeconomic Panel (GSOEP) to explore the incidence and wage effects of educational mismatch in Germany. Using a fixed effects model and random effects model, he finds that the wage gap between overeducated workers and workers who work in a job matching their actual schooling becomes smaller or in some cases disappears. Using the National Graduates Survey (NGS) in Canada, Frenette (2004) finds that wage penalties of overeducation for college and bachelor's level decline after controlling for unobserved heterogeneity. The wage penalty of overeducation for bachelor's degree decreases from 19% to 11% and the penalty for college graduates declines from 11% to 6%. Tsai (2010) uses data from the Panel Study of Income Dynamics (PSID) 1979-2005 to conduct a longitudinal analysis of the wage effects in the USA. He argues that unobserved heterogeneity is a main reason to explain the phenomenon of overeducation. Employing a fixed-effects model, the magnitude of the wage penalty to one year of surplus schooling decreases and the significance also becomes smaller. Iriondo and Perez-Amaral (2013) also obtain similar results in the longitudinal analysis of overeducation for European countries employing the dataset European Union Statistic on Income and Living Conditions (EUSI-LC). Korpi and Tåhlin (2009) suggest that the educational mismatch might be a real economic phenomenon, not just caused by the omission of variables, such as unobserved productivity. Their empirical analysis is based on the data from the Swedish Level of living surveys (LNU) 1974-2000 in Sweden. After explicitly using health and ability variables to control for unobserved heterogeneity, wage effects of educational mismatch don't change too much compared to the results without controlling for above human capital variables. In the ORU equation using fixed effects model, although coefficients of educational mismatch variables decrease noticeably, patterns of wage returns to overeducation and undereducation are consistent with the literature. Above studies all emphasise the importance of controlling for unobserved heterogeneity in the exploration of educational mismatch.

2.4 Data and Methodology

2.4.1 Data description

The empirical analysis employs data from the China Health and Nutrition Survey (CHNS), which is the largest and latest longitudinal data in China. This dataset is reliable, as it is an ongoing open cohort, administrated by an international collaborative project between the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention. It offers us detailed information on health, nutrition, habit and family planning policies and programs. Also it contains a wide-ranging set of socioeconomic factors like education, income, occupation and ownership.

The survey is conducted in nine provinces: Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong in China. They vary substantially in geography, economic development, public resources, and health indicators. These nine provinces represent four featured parts of China. Guangxi and Guizhou have many Minorities (*Zhuang, Yi and Miao*) and are relatively undeveloped provinces in southwestern China. Heilongjiang and Liaoning are located in the northeastern China with many large-scale industries. Henan, Hubei and Hunan are predominantly agricultural provinces in central China. Shandong and Jiangsu are the second and third of GDP ranking in China respectively, which are the representatives of developed provinces in eastern China.

The data was collected from 1989 with every two to four years and followed by 1991, 1993, 1997, 2000, 2004, 2006 and 2009. I use all 8 waves of the longitudinal dataset in this chapter, which may indicate different stages of the economic reform in China since 1978. Among them, the impact of early stage of labour market reform that started in 1982 can be captured by year 1989 and 1991; the year 1993 represents the middle stage of urban economic transitions after the reform re-started in 1992, and 1997 and 2000 represents the impact of 1997-98 Asian financial crisis. In addition, year 2004, 2006 and 2009 represent the mature stage of the economic transition (Kang and Peng, 2010).

In 1997 survey, Liaoning province was not included and Heilongjiang province was added. The dropped province Liaoning returned to the survey in 2000. Table 2-1 describes all the surveyed provinces and waves.

Table 2-1 Surveyed provinces and waves in CHNS

Region	Province	CHNS dataset
Northeast	Liaoning	1989, 1991, 1993, 2000, 2004, 2006, 2009
	Heilongjiang	1997, 2000, 2004, 2006, 2009
Central	Henan	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009
	Hubei	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009
	Hunan	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009
East	Shandong	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009
	Jiangsu	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009
West	Guangxi	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009
	Guizhou	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009

Only positive average monthly wages are included in the analysis and any subsidies and bonuses are not included; those who are retired, students, and homemakers are removed; owners of small household business and self-employed individuals are excluded because of the difficulty in obtaining reliable income figures from their business. In addition, CHNS collects information on both primary occupations and secondary occupations. In this chapter, only primary occupations are accepted[9]. Observations with any missing value on education, wages and occupations have been dropped. Observations used in this chapter are restricted to the age between 16 and 60. The legal minimum working age in China is 16 and the mandatory retirement age is 60 (Zhang et al., 2005).

Variables needed in this chapter are in separate datasets of CHNS, which are Individual Education File, Individual Jobs Files and Individual Earnings/Wages Files. These three are merged together using uniquely identified variables in each dataset. After merging and deleting observations with missing data, 17766 observations of 7724 individuals remain. Among them, 56 individuals attended all eight waves; 124 individuals attended seven waves; 175 individuals were surveyed in six waves and 442 individuals were surveyed in five waves. The detailed results are listed in Table 2-2.

Table 2-2 The number of waves individuals appearing

Number of waves	Number of individuals
1	3201
2	1817
3	1281
4	628
5	442
6	175
7	124
8	56
Total	**7724**

Table 2-3 Sample size and observation distributions

Survey year	Number	Percent	Deflated average monthly wage in raw wage data set (Yuan)	Average monthly wage (deflated in 1989 price)	Average monthly wage from NBS (deflated in 1989 price)	Government Sector (%)	Private Sector (%)	Average age of working people
1989	2797	15.74	100	100	100	92.2	2.8	35.0
1991	2769	15.59	99.1	101.8	113.4	94.5	2.1	34.5
1993	2363	13.30	124.4	125.9	133.9	93.4	1.3	35.3
1997	2194	12.35	193.5	198.2	158.9	83.9	3.7	36.0
2000	2014	11.34	279.4	301.2	233.2	73.1	5.8	36.5
2004	1757	9.89	369.9	390.2	378.8	53.8	29.9	39.3
2006	1843	10.37	461.2	483.8	480.3	48.2	35.8	40.3
2009	2029	11.42	639.0	682.0	673.8	45.6	41.8	40.8
Total	17766	100.00						

Note: all the results in this table are from writer's own calculations using CHNS dataset and National Bureau of Statistics of China.

As Table 2-3 shows, after deflating to Year 1989 price[10], average monthly wages increased more than six times in twenty years[11]. This trend is in line with the tremendous economic progress China has made since 1978. Zhang et al. (2005) pointed

[9] The reason behind is that secondary occupations are almost part-time or self-employed, which are not centered in this chapter.
[10] See Table A2.
[11] For a simple comparison, I also calculated deflated average monthly wages of the raw wage dataset in CHNS and the average monthly wages announced by National Bureau of Statistics of China, which are also listed in the Table 2-3.

out that the increasing wage returns to education after the transition seems to be an important reason for a large growth of wages. In addition, according to Cai and Du (2011), the changing relationship between demand and supply of labour from a centrally planned economy to the market-oriented one also contributed to the increasing trend of wages after the economic reform. Moreover, the wage system was designed to promote productivity and motivation rather than providing egalitarian incomes for workers also can explain the wage growth in China. Regarding the working age, the mean age increases from 35.0 years old in 1989 to 40.8 years old in 2009.

More than 90% of workers are employed in the government sector from 1989 to 1993, which is shown in Table 2-3. In 1991, this sector achieved the highest point at 94.5%. After 1993, it decreased dramatically from 83.9% to 45.6% in 2009. During this period, reconstruction of the state-owned enterprises (SOEs) and millions of state-owned laid-off workers (*Xiagang*) resulted in the decline of the percentage. On the contrary, the share of workers in the private sector, which includes family contract farming, private, individual enterprise or three-capital enterprise, enjoys an upward trend after 1993. The economic liberalisation and reconstruction of SOEs accelerated the ever-increasing expansion of the private sector and thus the ratio of individuals working in the private sector increased rapidly from 3.7% in 1997 to 41.8% in 2009. The above figures echo the economic transition that happened in China.

The dependent variable in this chapter is the natural logarithm of monthly wages last year, excluding any bonuses, all kinds of subsidies and in-kind benefits from the work unit. In terms of education attainment, education questions asked in this survey have two categories. One is the completed years of formal education in regular school and the other one is the highest level of education attained. Highest level of educational levels can be classified into the following groups: 1-- Primary school or less, 2--Lower middle school, 3--Upper middle school, 4--Technical or vocational, 5--University or college degree, 6--Master's degree or higher.

Table 2-4 Distribution of highest educational level

Highest level of education attained	Number	Percentage
Level=1, Primary school or less	3279	18.46
Level=2, Lower middle school	6545	36.84
Level=3, Upper middle school	4090	23.02
Level=4, Technical or vocational	2106	11.85
Level=5, University or college degree	1720	9.68
Level=6, Master's degree or higher	26	0.15
Total	17766	100.00

As we can see in Table 2-4, only 9.83% of observations own university/college or higher degree. However, compared to developed countries, like UK and USA, in which the proportion of workers with tertiary education degree are 42% and 38%, respectively in 2010 (OECD, 2012), the proportion of individuals with a higher education degree in China is still very low. If China wants to accelerate its economic development and improves its competitiveness in the world markets in the future, higher education expansion should be continued. In addition, the percentage of individuals acquiring a lower middle school qualification is the highest at 36.84%.

Table 2-5 Distribution of highest level of education by wave (1989-2009)

Year	Master's degree or higher	University or college degree	Technical or vocational	Upper middle school	Lower middle school	Primary school or less
1989	5 (0.18%)	112 (4.00%)	183 (6.54%)	526 (18.81%)	1109 (39.65%)	862 (30.82%)
1991	3 (0.11%)	155 (5.60%)	195 (7.04%)	613 (22.14%)	1160 (41.89%)	643 (23.22%)
1993	5 (0.21%)	134 (5.67%)	193 (8.17%)	545 (23.06%)	973 (41.18%)	513 (21.71%)
1997	2 (0.09%)	124 (5.65%)	247 (11.26%)	557 (25.39%)	852 (38.83%)	412 (18.78%)
2000	3 (0.15%)	189 (9.38%)	263 (13.06%)	524 (26.02%)	746 (37.04%)	289 (14.35%)
2004	1 (0.06%)	276 (15.71%)	326 (18.55%)	440 (25.04%)	523 (29.77%)	191 (10.87%)
2006	2 (0.11%)	342 (18.56%)	354 (19.21%)	411 (22.30%)	549 (29.79%)	185 (10.04%)
2009	5 (0.25%)	388 (19.12%)	345 (17.00%)	474 (23.36%)	633 (31.20%)	184 (9.07%)

There are two noticeable changes reported in Table 2-5. The first one is that the percentage of people who have a university or college degree increases nearly six times from 4.00% to 19.12% in twenty years. At the same time, the share of people who have a primary school qualification or less plummets from 30.82% in 1989 to 9.07% in 2009. Two reasons can be used to explain above figures. One is the expansion of higher education in China since the end of 1990s. The second one is the implementation of nine-year compulsory education in China since 1986. Additionally, the number of people owning a technical or vocational qualification doesn't increase as rapidly as people who have university or college degree. The percentage rises from 6.54% to 17.00% in twenty years. The share of upper middle school qualification increased from 18.81% to 26.02% from year 1989 to 2000 and decreased thereafter. Additionally, the percent of master's degree and doctoral degree doesn't change too much, keeping in a level around 0.20% from 1989 to 2009.

The variable experience is measured through age and educational attainment. Because there is no information about work experience in the dataset, the non-educational number of years is used as a proxy of maximum potential years of work experience, which can be defined as: Experience equals= age minus- education-6. Since this measurement method of working experience doesn't count the time period of looking for a job or unemployment or other unexpected situations, years of work experience may be overestimated in this way (Li, 2003). Experience squared is also used in the regression to represent diminishing returns to experience.

Two dummy variables (Female and Urban registration) are set to control for gender and identity (urban registration or rural registration). Another four dummy variables are added to represent type of work unit, which are government sector, collective sector, private sector and unknown work unit. To account for different economic regions involved in this survey, four dummy variables are created, which are Northeast (Liaoning and Heilongjiang), Central (Henan, Hubei and Hunan) and East (Shandong and Jiangsu), West (Guangxi and Guizhou). In addition, there are thirteen occupations classified in this survey, which is shown in Table A3 in the appendix. The aggregate occupation classification made by Ren and Miller (2012) is applied here to control for occupations in the empirical analysis, which are Clerk (office staff, ordinary soldier, and policeman), Junior (junior professional/technical worker, skilled worker and driver), Senior (senior professional/ technical worker), Leader (administrator/executive/manager or an army officer, police officer), Other (athlete, actor, musician or other) and Unskilled (service worker, farmer, fisher man, hunter or non-skilled worker)[12]. Additionally, four dummy variables are created to control for firm size. Eight dummy variables representing eight waves are adopted to control for time effects. The summary statistics are shown in Table 2-6 and the definition of all variables used in this chapter is presented in Table A6 in the appendix.

[12] Details are provided in Table A4 in the appendix.

Table 2-6 Summary statistics

Variables	Mean	SD	Min	Max
Dependent variable				
Log average monthly wages	5.206	0.861	0.354	9.529
Independent variables				
Years of schooling	9.980	2.747	6	18
Highest educational level: reference group (primary school or less)				
Primary school or less	0.185	0.388	0	1
Lower middle school	0.368	0.482	0	1
Upper middle school	0.230	0.421	0	1
Technical or vocational	0.119	0.323	0	1
University or college degree	0.097	0.296	0	1
Master's degree or higher	0.001	0.038	0	1
Required years of schooling	9.980	1.586	7.2	14
Years of overeducation	0.606	1.351	0	8.121
Years of undereducation	0.622	1.290	0	7.732
Female	0.409	0.492	0	1
Urban Registration	0.491	0.500	0	1
Age	36.891	10.656	16.02	60
Experience	20.912	11.134	0	47.99
Experience squared	561.25	507.213	0	2303.04
Ownership: reference group (Government sector)				
Government sector	0.759	0.428	0	1
Private sector	0.135	0.342	0	1
Collective sector	0.088	0.283	0	1
Unknown ownership	0.018	0.134	0	1
Job type: reference group (Permanent)				
Permanent	0.791	0.407	0	1
Contractor	0.096	0.294	0	1
Temporary	0.091	0.287	0	1
Other	0.023	0.149	0	1
Economic Regions: reference group (West)				
Northeast	0.184	0.387	0	1
Central	0.311	0.463	0	1
East	0.314	0.464	0	1
West	0.191	0.393	0	1
Firm size: reference group (Firm size 1)				
Firm size 1 (more than 100 employees)	0.235	0.424	0	1
Firm size 2 (between 20 and 100 employees)	0.177	0.381	0	1
Firm size 3 (Less than 20 employees)	0.110	0.313	0	1
Unknown firm size	0.478	0.500	0	1
Aggregate Occupation: reference group (Unskilled)				
Clerk	0.115	0.319	0	1
Junior	0.290	0.454	0	1
Senior	0.075	0.264	0	1
Leader	0.108	0.311	0	1
Other	0.027	0.162	0	1
Unskilled	0.384	0.486	0	1
Wave: reference group (Wave 1989)				
1989	0.157	0.364	0	1
1991	0.156	0.363	0	1
1993	0.133	0.340	0	1
1997	0.123	0.329	0	1
2000	0.113	0.317	0	1
2004	0.099	0.299	0	1
2006	0.104	0.305	0	1
2009	0.114	0.318	0	1
Total		17766		

2.4.2 Incidence of overeducation

Due to data availability in CHNS, the realised matches (RM) method is adopted to define required education in this chapter, which was proposed by Verdugo and Verdugo (1989) and Kiker et al. (1997). There are two expressions in realised matches: the mean index and the mode index. Both indexes are adopted to explore the extent of overeducation and undereducation in this chapter. In the mean index, required education is defined as the mean of completed years of education within each occupation and each wave. Workers are considered to be overeducated if their actual education is greater than one standard deviation above the mean level of education for the specific occupation in a given wave or undereducated if their actual education is more than one standard deviation below the mean level of education for the specific occupation in a given wave. Required education in the mode index is described as the most frequent level of education within each occupation and each wave. If one's educational level is higher than this modal level, one is treated as overeducated and undereducated if one's educational level is below this modal level.

Table 2-7 presents detailed information about the incidence of overeducation and undereducation for the full sample and by gender. Based on the mean index, about 18.19% of workers are estimated to be overeducated and 20.33% of the labour force is treated as undereducated. The remaining 61.48% have the correct education required for their jobs. In terms of gender, the disparity of overeducation seems very little. 18.35% of male workers are estimated as overeducated and 17.97% of female employees are overeducated. At the same time, 61.75% of female workers and 61.29% of male workers are correctly educated. Based on the summaries in different studies using the mean index technique, the incidence of overeducation is between 10% and 15% (McGuinness, 2006). The incidence of overeducation in the Chinese labour market is slightly higher in comparison.

However, in terms of the mode index, the extent of overeducation seems more serious. Both the incidence of overeducation and undereducation are higher than those using the mean index. 26.10% of workers have surplus education above the required education level of their occupations. 30.16% are undereducated and less than half of workers are correctly educated. In addition, the proportion of overeducation for males is nearly 2 percentage points higher than that for females. The percentage of females who are undereducated is 30.76%, which is 1 percentage point higher than males (29.74%). Because different methods of measuring required education may lead to different results of the incidence of overeducation, it is not surprising that we get different results of the incidence of overeducation in this chapter.

As we can see in Table 2-8, almost 76.15% of observations are classified into the same category in different definitions of required education. The correlation between the mean index and mode index is 0.7580. Additionally, 23.85% of observations have changed mismatch status using different index to define required education. Iriondo and Pérez-Amaral (2013) report that 79.79% of observations are classified into the same category using both mean index and mode index methods, which are very similar with the result in this chapter.

Table 2-7 Incidence of overeducation/undereducation full sample and by gender

Description	Full sample		Female		Male	
	Mean	Mode	Mean	Mode	Mean	Mode
Correctly educated	61.48	43.74	61.75	44.34	61.29	43.33
Overeducated	18.19	26.10	17.97	24.90	18.35	26.93
Undereducated	20.33	30.16	20.28	30.76	20.36	29.74
Total	100	100	100	100	100	100

Table 2-8 Overeducation /Undereducation in the mean index and the mode index

The mean index	The mode index			
	Undereducated	Correctly educated	Overeducated	Total
Undereducated	3567 (20.08%)	45 (0.25%)	0	3612
Correctly educated	1772 (9.97%)	7237 (40.74%)	1913 (10.77%)	10922
Overeducated	19 (0.11%)	489 (2.75%)	2724 (15.33%)	3232
Total	5358	7771	4637	17766

Note: the percentage of people who are classified into same category in both mean index and mode index is 76.15% (20.08%+40.74%+15.33%=76.15%).

2.4.3 Estimation methodology

2.4.3.1 Ordered Probit Model

I first explore the determinants of overeducation in this chapter. Because individuals who are estimated to be undereducated, correctly educated and overeducated are defined as 0, 1 and 2 in the data. Thus, ordered probit model technique will be employed here. We can get threshold coefficients and parameter β through ordered probit model. For each observation, the ordered probit model can be obtained by a latent variable approach[13], which is specified as:

$$Y_i^* = \beta X_i' + \mu_i \tag{4}$$

$$Y_i = \mathrm{m} \text{ if } \alpha_{m-1} < Y_i^* < \alpha_m \tag{5}$$

Y_i is an ordered response representing values $\{0,1,2, \dots \dots . M\}$. α_{m-1}, α_m are a set of unknown threshold coefficients or cutpoints to be estimated. β is a vector of estimated parameters and μ_i is an error term which is normally distributed with mean zero and variance one[14]. Y_i^* is a latent and unobserved variable which can be treated as utility value.

Under the latent variable model, the probability that observation *i* will be treated as m is as follows:

$$Pr\ (Y_i = \mathrm{m}\ |X_i) = Pr\ (\alpha_{m-1} < Y_i^* < \alpha_m) \tag{6}$$

Y_i^* can be written as a cumulative probability model. The whole form of the cumulative probabilities under the latent variable model can be written as follows:

$$\Pr\ (Y_i = \mathrm{m}\ |X_i) = \begin{cases} \Phi(\alpha_1 - \beta X_i') & m = 1 \\ \Phi(\alpha_m - \beta X_i') - \Phi(\alpha_{m-1} - \beta X_i') & 1 < m \leq M - 1 \\ 1 - \Phi(\alpha_{M-1} - \beta X_i') & m = M \end{cases} \tag{7}$$

where $\Phi(*)$ is the cumulative distribution function. That is to say, the possibility of individual *i* making a choice of m depends on the product Y_i^* falling between cutpoints

[13] A latent variable is assumed to represent the ordered response.

(*m-1*) and m (Baum, 2006). A straightforward way to get the parameters of ordered probit model is Maximum Likelihood Estimation (MLE), which aims to find β and α_j that make the joint probability of obtaining m maximum (Powers and Xie, 2008).

2.4.3.1.1 Maximum Likelihood Estimation (MLE)

Maximum likelihood estimation (MLE) is a general method for non-linear estimation in statistics and econometrics. Suppose there is an independent and identically distributed distribution $\{Y_1, Y_2, Y_3, \dots\dots\dots\dots\dots Y_n|X_n\}$ and its density function is defined as f($Y_i|X_i$; θ). θ is a vector of unknown parameters. The joint density function of this sample can be written as follows:

$$f(Y_1, Y_2, \dots\dots, Y_n|X_i; \theta) = \prod_{i=1}^{N} f(Y_i|X_i; \theta) \tag{8}$$

and the likelihood function is defined as:

$$L(\theta|Y_i, X_i) = \prod_{i=1}^{N} L_i(\theta|Y_i, X_i) = \prod_{i=1}^{N} f(Y_i|X_i; \theta) \tag{9}$$

In order to calculate conveniently, a natural logarithm of likelihood function is applied in practice:

$$lnL(\theta|Y_i, X_i) = \sum_{i=1}^{N} lnf(Y_i|X_i; \theta) \tag{10}$$

where $lnL(\theta)$ is the log-likelihood function. Maximum likelihood estimation is to find a $\hat{\theta}$ that can get the highest probability of choosing the observed sample. Therefore, the solution is given by:

$$\underset{\theta}{MAX}\, lnL(\theta; Y) = \underset{\theta}{MAX} \sum_{i=1}^{N} lnL_i(\theta; Y) \tag{11}$$

$$\frac{\partial lnL(\theta)}{\partial \theta}| = \sum_{n=1}^{N} \frac{\partial lnL_i(\theta)}{\partial \theta}| = 0 \tag{12}$$

Based on the above, we can see that the likelihood function is equal to the joint density function. If the joint density function is known, we can get maximum likelihood

[14] β represents for the similar effect of X_i on Y_i and X_i on Y_i^*.

estimator.

In the ordered probit model, for each observed m, we write the log-likelihood function as:

$$L = \prod_{i=1}^{N} \prod_{m=1}^{M} Pr(Y_i = m|X_i)^{Z_{im}} \tag{13}$$

$$\ln L = \sum_{i=1}^{N} \sum_{m=1}^{M} Z_{im} \ln[\Phi(\alpha_m - \beta X_i') - \Phi(\alpha_{m-1} - \beta X_i')] \tag{14}$$

where Z^{im}=1 if $Y_i = m$.

2.4.3.1.2 Marginal effects

In the latent variable approach, the effect of one independent variable on the dependent variable is expressed as changes in Y_i^* when there is one unit change in X_i. However, Y_i^* is a latent and unobserved variable, so the alternative choice is to calculate the marginal effects of the independent variables in the conditional distributions (Baum, 2006). Thus, the marginal effects of X_i can be calculated in the following way (Powers and Xie, 2008):

$$\frac{\partial Pr\,(Y_i=\text{m}\,|X)}{\partial X_i} = \begin{cases} -\Phi((\alpha_1 - \beta X_i')\beta_i & m = 1 \\ [\Phi(\alpha_{m-1} - \beta X_i') - \Phi(\alpha_m - \beta X_i')]\beta_i & 1 < m \leq M-1 \\ \Phi(\alpha_{M-1} - \beta X_i')\beta_i & m = M \end{cases} \tag{15}$$

2.4.3.2 Panel data

The expression form of a panel data is different from a regular cross-sectional data and time-series data, which has a double subscript on its variables. Considering there is one explanatory variable X for each *i*, the following equation shows features of panel data in detail:

$$Y_{it} = \alpha_{it} + \beta X_{it} + \mu_i + \varepsilon_{it}, \quad t=1, 2, \ldots\ldots T \tag{16}$$

The subscript *i* indicates cross-section scale and *t* shows time dimension. α_{it} is an intercept and X_{it} contains information on both time-varying variables and time-invariant variables. β is the coefficient of X_{it} . μ_i only has one subscript, which denotes the unobserved individual-specific effect. It is assumed to be time-invariant random variable and distributed independently across individuals. ε_{it} can be called idiosyncratic errors as it varies with individuals and time t as well.

If we suppose that every observation in the panel data has the same regression equation as equation (16), we can put observations together to make OLS regression, which can be called "Pooled OLS Regression". Error terms in different times within individuals may be correlated with each other, so cluster-robust standard errors should be used in the Pooled OLS Regression. In equation (16), $\mu_{i+} \varepsilon_{it}$ can be treated as the composite error term v_{it}, e.g. $v_{it} = \mu_{i+} \varepsilon_{it}$. However, there is potential problem in the pooled OLS regression that unobserved heterogeneity is not taken into consideration, i.e. no μ_i in equation (16). In order to control for unobserved individual-specific effects, two models are widely used in the panel data. The first one is the fixed effects model by estimating the deviation from the mean of each observation. The second model is the random effects model. In the fixed effects model, μ_i is permitted to be correlated with the independent variables, while in the random effects model, μ_i is assumed to be unrelated with the regression variables.

2.4.3.3 Fixed Effects model (FE)

If there are potential correlations between μ_i and X_i variables in panel data, Ordinary Least Squares (OLS) is not efficient anymore and can yield biased estimation of the parameters. In order to overcome this problem, fixed effects model is widely used to eliminate the individual specific effects, which is described as follows:

If we average equation (16) over time for each individual *i*, then we can get

$$\overline{Y_\iota} = \overline{\alpha_\iota} + \beta \overline{X_\iota} + \mu_i + \overline{\varepsilon_\iota} \qquad (17)$$

where $\overline{Y_\iota} = T^{-1} \sum_{t=1}^{T} Y_{it}$ and similar for $\overline{X_\iota}$ and $\overline{\varepsilon_\iota}$.

Then we subtract equation (17) from equation (16)

$$Y_{it} - \overline{Y_i} = \beta(X_{it} - \overline{X_i}) + (\varepsilon_{it} - \overline{\varepsilon_i}) \tag{18}$$

or

$$\ddot{Y_{it}} = \beta \ddot{X_{it}} + \ddot{e_{it}} \tag{19}$$

Where $\ddot{Y_{it}}$ is equal to Y_{it} - $\overline{Y_i}$ and similarly for $\ddot{X_{it}}$ and $\ddot{e_{it}}$. This process is also called fixed effects transformation. β is called fixed effects estimator or within-group estimator. μ_i is deleted in the transformation process, which is the advantage of this model. However, any time-invariant variables will also be deleted, such as gender, country and so on.

2.4.3.4 Random Effects model (RE)

Suppose we think μ_i is uncorrelated with each explanatory variable in all times, that is to say,

$$\mathrm{Cov}\,(X_{it}, \mu_i) = 0, \qquad t = 1, 2, \ldots\ldots, T \tag{20}$$

Then, equation (16) can be used to make random effects model transformation. If we define μ_i as one part of the composite error term v_{it}, e.g. $v_{it} = \mu_i + \varepsilon_{it}$, which means v_{it} are serially correlated across time. That is to say,

$$Cov\,(\mu_i + \varepsilon_{it}, \mu_i + \varepsilon_{is}) = \begin{cases} \sigma_\mu^2, & t \neq s \\ \sigma_\mu^2 + \sigma_\varepsilon^2, & t = s \end{cases} \tag{21}$$

σ_μ^2 is the variance of μ_i and σ_ε^2 is the variance of ε_i. The coefficient of autocorrelation is ρ:

$$\rho \equiv Corr(\mu_i + \varepsilon_{it}, \mu_i + \varepsilon_{is}) = \sigma_\mu^2 / \sigma_\mu^2 + \sigma_\varepsilon^2 \tag{22}$$

One solution to solve the autocorrelation problem is FGLS (Feasible Generalized Least-Squares) method. Detailed FGLS transformation procedures can be seen from Wooldridge (2013). If we define:

$$\theta \equiv 1 - \sigma_\varepsilon / (\sigma_\varepsilon^2 + T\sigma_\mu^2)^{1/2} \tag{23}$$

Then take θ into equation (17), which turns out to be

$$Y_{it} - \hat{\theta}\overline{Y_i} = \alpha\ (1-\hat{\theta}) + \beta\ (X_{it} - \hat{\theta}\overline{X_i}) + (1-\hat{\theta})\ \mu_i + (\varepsilon_{it} - \hat{\theta}\overline{\varepsilon_i}) \quad (24)$$

where the overbar is the time average. $\hat{\theta}$ is the estimator of θ. The above is called Random effects model (RE). As is shown in equation (24), error term is not autorrelated. Compared with fixed effects model, random effects model can explore all the variables effects in the equation, which is an advantage over the fixed effects model.

2.4.3.5 Empirical Models

Since the dataset used in this chapter is longitudinal, first, pooled OLS method is employed to explore the ORU equation in both indexes. The model is described as follows:

$$\ln w_{it} = \beta X_{it} + \alpha_1 REDU_{it} + \alpha_2 OEDU_{it} + \alpha_3 UEDU_{it} + \varepsilon_{it} \quad (25)$$

where $REDU_{it}$ is the years of required education. $OEDU_{it}$ and $UEDU_{it}$ are the years of overeducation and years of deficit education respectively. ε_{it} are clustered error terms. X_{it} is a vector of control variables, which contains potential working experience, experience squared, gender, registration status, ownership, job type, firm size, aggregate occupation and economic regions.

The data in CHNS covers 20 years, from 1989 to 2009. As we all know, the society and economy has changed dramatically in China in these twenty years, which may influence wage effects of education to a large extent. Thus any time effects should be taken into account. The great majority of previous studies employ cross-sectional data to explore the wage return to overeducation, thus they don't consider time effect. If we take time effects into consideration, wage effects of overeducation may be different compared with existing findings. Therefore, time dummies are added into equation (25), which is described as follows:

$$\ln w_{it}= \beta X_{it} + \lambda_1 REDU_{it} + \lambda_2 OEDU_{it}+ \lambda_3 UEDU_{it}+ T+\varepsilon_{it} \tag{26}$$

where T represents for time effects. Time effects are seven dummy variables representing wave 1991, 1993, 1997, 2000, 2004, 2006 and 2009. Wave 1989 is the benchmark year.

In order to control for unobserved heterogeneity, I employ fixed effects model and random effects model to revisit the ORU model (Equation (2) in section 2.3.4). However, the equation is slightly different from equation (26), which is described as follows:

$$\ln w_{it}= \beta X_{it} +\sigma_1 REDU_{it}+ \sigma_2 OEDU_{it}+ \sigma_3 UEDU_{it}+\mu_i+T+ \varepsilon_{it} \tag{27}$$

Where μ_i is unobserved individual effects.

In addition, the VV model (Equation (3) in section 2.3.4) is also applied in this chapter using the same econometric techniques as ORU equation: pooled OLS, pooled OLS with time effects, fixed effects and random effects model, which are shown in below:

$$\ln w_{it} = \delta X_{it} +\gamma_1 CEDU_{it}+ \gamma_2 OE_{it}+ \gamma_3 UE_{it}+ \varepsilon_{it} \tag{28}$$

$$\ln w_{it} = \delta X_{it} + \theta_1 CEDU_{it}+ \theta_2 OE_{it}+ \theta_3 UE_{it}+T+ \varepsilon_{it} \tag{29}$$

$$\ln w_{it} = \delta X_{it} +\varphi_1 CEDU_{it}+ \varphi_2 OE_{it} + \varphi_3 UE_{it} +\mu_i+ T+ \varepsilon_{it} \tag{30}$$

Where $CEDU_{it}$ is the years of actual completed years of education, OE_{it} and UE_{it} are two dummy variables representing for people who are overeducated and undereducated respectively. T represents for time effects and μ_i is unobserved individual effects. X_{it} is the set of control variables used in the ORU equation.

If we assume that μ_i is individuals' unobserved productivity or ability, ability has a negative relationship with $OEDU_{it}$ (years of overeducation) and positive relationship with $REDU_{it}$ (required education) and $UEDU_{it}$ (deficit years of schooling) (Korpi and Tåhlin, 2009). Omission of ability in the ORU equation would have overestimated the wage return to required education and underestimated the absolute value of coefficients of $OEDU_{it}$ and $UEDU_{it}$. In the VV equation, under the same assumption with the ORU equation, without controlling for unobserved ability would yield upward bias of coefficients of years of schooling ($CEDU_{it}$), dummy variables OE_{it} (overeducation) and UE_{it} (undereducation).

2.5 Empirical analysis

2.5.1 Determinants of overeducation

Table 2-9 reports the marginal effects of the probability of being overeducated among the selected variables using the ordered probit model. Since this dataset is longitudinal and observations maybe observed in consecutive years, the standard errors are clustered by individuals, allowing errors to be correlated across different years within the same individual. Here, I choose both the mean index and the mode index method to define required education in the ordered probit estimation.

Gender

In terms of gender, both indexes show that males are more prone to be overeducated than females, which is also reported in Kiker et al. (1997), Sloane et al. (1999) and Hung (2008). Reasons behind this are maybe that males have more responsibility to support family life than females, thus they are more likely to accept jobs that require lower educational level than their own. In addition, males are the main labour force in the Chinese labour market regardless of the job and are more likely to be estimated as overeducated, which is also similar with Taiwan's labour market (Hung, 2008).

Registration area

As can be seen from Table 2-9, the marginal effects of urban registration in both indexes reveal that workers who have urban registration run a higher risk of being overeducated than rural people. On one hand, urban workers have a higher average educational level and better quality of education than rural workers (Rong and Shi, 2001). On the other hand, although job vacancies in urban labour market are more abundant than in rural areas, competition is sharper in urban areas than in rural areas. Under the fierce competition in the urban labour market, urban workers may work in a job that is lower than their educational level in order to make a living and thus they have higher probability of being overeducated than rural workers.

Educational level

Based on the results from Table 2-9 (column 3 and column 6), individuals who have master's degree or higher and university or college degree are more prone to be estimated as overeducated than people with primary school degree or less, which is confirmed in both two index where both estimations are highly significant. In addition, people who have lower middle school, higher middle school and vocational degree all have higher probabilities of being overeducated in comparison with people who have primary school degree or less. Frenette (2004) and Mayston and Yang (2008) all find similar results.

Work experience

As can be seen in Table 2-9 (column 3), experience has a negative relationship with the probability of being overeducated using the mean index. Workers with more working experience are less likely to be estimated as overeducated. In this case, overeducation is a compensation of insufficient working experience to perform a job. This result supports human capital theory that only the total human capital can determine whether a worker is able to do a specific job (Sicherman, 1991). Hartog and Oosterbeek (1988), Kiker at el. (1997) and Hung (2008) all support this point of view through empirical analysis. However, in the mode index (column 6), those people with more experience have higher possibility of being overeducated, which is in contrast to the existing literature.

Ownership

According to Table 2-9, consistent results have been found using both indexes that people working in the private sector and collective sector are more likely to be overeducated than individuals in the government sector. Two reasons may be used to explain. On one hand, the government sector has high wages, stable working environment and attractive welfare, which make it more easily to hire matched workers. On the other hand, individuals may find jobs in the private sector temporarily to gain experiences in order to find matched and stable jobs in government sector in the future. Patrinos (1997) argues that the public sector is a good place to solve the problem of overeducation in Greece.

Firm size

As can be seen from Table 2-9, people who work in firms with between 20 and 100 employees and in firms with less than 20 employees are less likely of being overeducated than workers in firms with more than 100 employees in both indexes, which is contrast to Battu et al. (1999). The reason behind it may be that employees in large firm have more opportunities to be promoted, have better career prospects and receive more fringe benefits compared to people who work in a small company (Kalleberg and Van Buren, 1996). Therefore, overqualified workers may voluntarily choose to stay in large firms due to the consideration of the above reasons.

Year

The marginal effects of seven waves are negative in both indexes, which may indicate that years after 1989 are less likely to be estimated as overeducated than year 1989. This result is not consistent with our expectations. It may due to the following reasons. First, with the accelerated pace of education expansion, the average educational level of labour force is increasing[15]. The incidence of overeducation may decline with the increased average level of years of schooling. Second, since the economic reform in 1978, the Chinese economy has been growing at a rapid pace, especially after China's accession into WTO. The ever increasing degree of economic openness and the accelerated growth of the private sector may provide more opportunities for workers to choose. Thus, people can have more chance to find a matched job, which will reduce the possibility of being overeducated to some degree. Third, millions of state-owned workers had been laid-off (Xiagang) due to the reform of state-owned enterprises in the 1990s. However, majority of the "laid-off" workers are people who are older than 40 with low level of education, which may make the mean education level increase among current workers. Last but not least, the financial crisis in 2008 forced many firms to employ and retain the most qualified and skilled workers to improve work efficiency and keep profit, which may be expected that the average level of education will rise (Lenton, 2012).

[15] The average years of education in each wave is as follows: 8.91 years in 1989; 9.38 years in 1991; 9.50 years in 1993; 9.71 years in 1997; 10.19 years in 2000; 10.84 years in 2004; 11.08 years in 2006; 11.18 years in 2009.

Apart from above analysis, Table 2-9 also implies that temporary workers are more likely to be overeducated than permanent workers in both indexes. Contractor workers are more likely of being overeducated than permanent workers that can only be found in the mode index. The temporary or short-term feature of these two job types may make workers choose to stay in an overeducated status and then change to a matched job later on. In terms of regional distribution, we can see from Table 2-9 that only east region in the mean index is more likely to be estimated as overeducated than the west region.

In ordered probit model, only results of gender, household registration, highest educational level, ownership, firm size, aggregate occupation and year are consistent in both two indexes. According to Verhaest and Omey (2010), different overeducation measurements may influence the outcome. Neither of measurements can capture the whole overeducation. Therefore, it is not surprising that results are different. In addition, we only focus on the exploration of the determinants of overeducation here. The analysis of the determinants of undereducation and corrected education is beyond our scope.

2.5.2 Wage effects of over-and undereducation in the ORU specification

2.5.2.1 Wage effects of overeducation and undereducation by full sample

Table 2-10 reports estimated results of the ORU specification in full sample using both the mean index and the mode index. Columns (1) to (4) are results based on the mean index and columns (5) to (8) are estimated using the mode index. Among them, columns (1) and (5) report results of the pooled OLS regression method without controlling for time effects, columns (2) and (6) present results of the pooled OLS analysis taking time effects into consideration, columns (3) and (7) display coefficients from the Fixed effects model and results from the Random effects model are shown in columns (4) and (8). Note that, standard errors in the pooled OLS are clustered by individuals.

As can be seen from Table 2-10 column (1) in the mean index, the wage return to an additional year of required education is around 23%. The wage return to one year of surplus education is around 3% and the coefficient of deficit education suggests that undereducated workers suffer from wage penalties of around 4%. The above results are in line with previous findings using the ORU equation that educational mismatch of workers causes wage differentials (Tsai, 2010). However, the wage return to required education is much higher than wage returns to surplus education. This is expected as not having time effects included in the regression. In terms of the mode measure, as indicated in column (5) in Table 2-10, the wage return to required education level is 26.20%. The wage return to overeducation is 9.68% and the negative wage return to each additional level of deficit education is about 13.19%. However, the mode index measures the wage return to educational level, which should be higher than the wage return to years of schooling.

Seven dummy variables to control for time effects are added into both columns (2) and (6). After adding time dummies, the wage return to required education decreases a lot to 2.80% in the mean index, which is shown in column (2) in Table 2-10[16]. It seems that controlling for time effects has a big impact on the wage effects of required education and it also provides answers why the wage return to required education in column (1) is so high. In addition, the wage return to an extra year of surplus education is about 2.6%, as indicated in column (2). We can also see that wage penalty of deficit education decreases from 4% in column (1) to 2% in column (2). Apart from the above analysis, the R squared in column (2) (0.6510) is higher than in column (1) (0.5588), which means that column (2) explains wage effects of overeducation better than column (1). In terms of the mode measure, as can be seen from Table 2-10 column (6), the wage return to required educational level is 7.73%. The wage return to overeducated workers declines substantially from 9.68% in column (5) to 3.94% in column (6). In addition, the magnitude of the wage effects of undereducation also decreases from 13.19% in column (5) to 8.08% in column (6).

Note that coefficients of the seven year dummies in columns (2) and (6) can be treated as indicators of the deepening of economic reform and market improvement since 1978. The wage variable has been deflated to 1989 prices, therefore the ever increasing coefficients from Year 1989 to 2009 indicate that wage returns increased year-on-year along with the strong economic growth in China from 1989 to 2009.

Based on the above pooled OLS analysis, similar patterns of wage effects of overeducation from the mean index and mode index in Table 2-10 echo Hartog (2000)'s point of view that different definition of required education conduct similar results of wage effects of overeducation. In addition, time effects indeed have a big impact on the wage return to overeducation and undereducation in this chapter. Although time effects change the magnitude of wage effects, the patterns of estimation results are still consistent with previous findings that overeducated workers have higher wages and undereducated workers suffer from wage penalties compared to correctly educated workers who are in the same occupation.

However, pooled OLS estimation has been criticised for not taking unobserved heterogeneity into consideration. In columns (3), (4), (7) and (8) in Table 2-10, a Fixed effects model and a Random effects model are used to deal with the unobserved heterogeneity problem. However, based on a Hausman test, the random effects model is rejected in favour of the Fixed effects in both indexes. Next, I will explicitly explain results from fixed effects model. Regarding the mean index, results in column (3) suggest that after using fixed effects model, the wage return to required education decreases and is only significant at 10% level. The wage return to undereducation becomes small and insignificant. At the same time, the magnitude of wage effects of overeducation drops from 2.57% to 1.83%. In terms of the mode index in column (7), the magnitude of wage effects of required education becomes smaller than column (6). The wage return to overeducation increases slightly from 3.94% to 4.52% and the wage penalty to overeducation becomes smaller[17], which are consistent with our expectations if we assume the unobserved heterogeneity as unobserved ability. However, wage returns to deficit education become small and insignificant. Noticeable changes of coefficients of educational variables indicate that unobserved heterogeneity indeed plays an important role in the analysis of wage effects of overeducation. However, if we assume unobserved heterogeneity as ability, the mode index yields feasible results in the fixed effects model except for the wage return to undereducation.

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[16] Comparing with results of the wage return to overeducation in each wave in Table 2-13, this figure is rational.

[17] The wage penalty to overeducation is the gap between the wage return to required education and the wage return to overeducation, i.e. wage penalty of overeducation, compared to correctly educated workers with similar educational attainment.

Comparing with the results in the mean index, using the mode index to explore wage effects of overeducation in both pooled OLS estimation and panel estimation methods are found to be more consistent with the major findings of the existing literature (Groot and Maassen van den Brink, 2000); (Hartog, 2000); (Bauer, 2002); (Frenette, 2004); (Tsai, 2010).

2.5.2.2 Wage effects of overeducation by age groups

One point couldn't be neglected is that due to significant changes within the education system overtime in China, people who have schooling in 1960s and 1970s (Mao education system) experienced different education systems compared to people who have schooling in 1980s and after (Post-Mao education system). People who experienced Post-Mao education system are more likely to be estimated as overeducated. In order to alleviate and differentiate the impact of different education systems on the wage effects of overeducation, we try to explore by age groups. People are classed according to their received education systems. The new Chinese education system began to build since 1978. Thus, the first group is people who were born in 1972 (and afterward), went to school around 1978 (and afterward) receiving Post-Mao education (the starting age of schooling is six). The other group is the people who were born before 1972 having Mao education[18]. The distribution of highest educational level of these two groups is in Table A5 in the appendix. After splitting groups, 3368 observations are in the first group and the remaining 14398 observations are in the second group.

The results of wage effects of educational mismatch by age groups are reported in Table 2-11 using the mean index and Table 2-12 in the mode measure. Firstly, patterns of coefficients of the pooled OLS estimation without considering time effects of two groups using both indexes are consistent with the full sample (column (1) and (5) in both Table 2-11 and Table 2-12). Then, comparing column (2) with column (6) in both Table 2-11 and Table 2-12, wage returns to required education for people who have received Post-Mao education are higher than those who have received Mao education

[18] The mean birth year of the second group is in 1957 and the average schooling of this group is 9.82 years. Thus we can assume that this group represents people who received Mao education. The mean birth year of the first group is in 1977 and the average schooling of the first group is 10.67 years.

using both indexes. People in the first group (i.e. individuals with Post-Mao education) generally start to work in the labour market around 1990 and afterward. Therefore, they earn wages from a labour market with more flexibility and market-oriented decision-making mechanism than the second group. This excess of wage returns to required education between two groups indicates that the labour market reform indeed takes effect. Apart from this, new educational agenda in Post Mao education system paid more attention to the importance of education to facilitate economic construction, which led to improved school quality (Qian and Smyth, 2008). Thus, the higher school quality in post Mao education system may play a role to explain higher wage returns to required education of the first group. In addition, the increasing education cost in the Post Mao education system can also result in such an excess wage return to required education between these two groups (Li, 2003).

Comparing column (2) with column (6) in Table 2-11, the wage return to overeducation in the mean index of the first group is higher than the second group. While in Table 2-12 column (2) and column (6), we can see that the wage return to overeducation in the mode index is lower in the first group than the second group. Generally speaking, the gap between wage returns to required education and wage returns to overeducation is the wage penalty to overeducation. Overeducated people may incur wage penalty and thus this gap should be positive. However, in the mean index, the gap in the second group is negative (Table 2-11 column (6)), which is very unusual. While in the mode index, gaps in both groups are positive (Table 2-12 column (2) and column (6)), which is consistent with existing literature (Rumberger, 1987); (Sicherman, 1991); (Hung, 2008). Therefore, the wage return to overeducation using mean index for Mao education group should be interpreted with caution. According to Table 2-12 column (2) and column (6), we can see that wage penalty to overeducation (6.72%) is much larger in the first group than that in the second group (2.07%). Education expansion since 1978 may make people who received education from the new education system more likely to be overeducated (Li et al., 2008)[19]. Moreover, with more attention from the whole country on the importance of education in the new education system, investment in education and education cost have been growing (Qian and Smyth, 2008), which may

[19] In this chapter, the incidence of overeducation of the first group is 30.91% and the incidence of overeducation of the second group is 24.98%. Both calculations are based on the mode index.

result in large wage penalty of people who have surplus education than job required[20]. In addition, high wage penalty to overeducation of the first group also indicates that education-matching problem is an important feature among people who experience Post Mao education system. Lower wage penalty to overeducation of the second group indicates that the education-job matching is not valued that much among people who have education from Mao education system, which can be explained by the wage compression and centrally planned job assignment system before 1978 to some extent.

In terms of wage returns to undereducation using pooled OLS with time effects model, the wage penalty of undereducated workers are higher in the first group (Post-Mao education) than the second group (Mao education), which are reported in both indexes. This result indicates that undereducated people in the second group may possess some other skills or human capital to compensate insufficient formal education compared to undereducated people in the first group. We can see that people in the second group (Mao education system) are relatively older workers, less-well educated and entered labour market earlier. They are more familiar with the labour market and may have more skills related to work or working experiences to compensate deficit education than undereducated people in the first group. The smaller wage penalty associated with undereducation among people who acquire Mao education is consistent with the motivation/ability hypothesis proposed by Chiswick (1978). In all, results of wage effects of overeducation from pooled OLS estimation using the mode index not only confirm the main conclusions of the existing literature, but also show different pictures of wage effects of overeducation between Post Mao and Mao education systems.

Then, we take unobserved heterogeneity into account[21]. In terms of individuals who have experienced Mao education system, controlling for unobserved heterogeneity into consideration using the mode index (Table 2-12 Column (7))[22], there is a slight increase in the wage return to overeducation compared to Table 2-12 Column (6). The wage return to required education is close to the wage return to overeducation in Column (7). In addition, the wage return to undereducation decreases. It seems that the unobserved

[20] Large wage penalty to overeducation in the first group may indicates that investment in education is insufficient and a waste of resources.
[21] Based on Hausman test, random effects model are rejected in Table 2-11and Table 2-12.

heterogeneity (ability) can be responsible to explain the wage effects of educational mismatch of people in the second group to some extent. All the coefficients of educational mismatch variables become smaller and insignificant using the mode index in the first group, which are not reasonable results. This may be explained by low within-group standard deviation of required educational level, level of overeducation and deficit schooling in the first group using the mode index[23]. That is to say, there are relative few individuals experiencing the changes of jobs or years of schooling as birth years of people in the first group are close to the current time (younger group), which may not able to identify the wage effects of overeducation in the fixed effects model. Bauer (2002) and Tsai (2010) all mention this issue in their studies.

2.5.2.3 Wage returns to schooling and wage effects of overeducation over time

In order to support the idea in this chapter that time effects have a big impact on the wage return to required education, overeducation and undereducation, which is shown in Table 2-10 Columns (2) and (6), I also explore the wage return to schooling in each wave and the wage effects of educational mismatch by wave. Table 2-13 reports detailed estimation results. The upper half of Table 2-13 is in the mean index and the lower half is in the mode index. As can be seen from Table 2-13 in the mean index, the wage return to education is very low in the 1990s, almost between 1% and 2% (2% to 5% in the mode index), and even sometimes insignificant. However, from 2000, the wage return to years of schooling began to increase to about 6%. Wage returns to schooling in the 1990s are lower than in the 2000s in both indexes, which is in line with Kang and Peng (2010). Most existing studies find the return to years of schooling before 2000s in China is less than 4% (Li, 2003). Since we only count the single monthly wages excluding any bonus and benefit, the wage return to education is lower in this chapter than others. In addition, the wage return to qualification is higher than the wage return to years of schooling. In terms of wage effects of educational mismatch, there is also a significant difference between the 1990s and the 2000s in both indexes[24]. In the

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[22] In the mean index, controlling for unobserved heterogeneity, wage returns to required education and wage returns to undereducation become insignificant and wage returns to overeducation become smaller for people who experienced Mao education system.

[23] The within-standard deviations of required educational level, overeducated level and undereducated level are 0.43, 0.34 and 0.24 respectively in the first group, while within-standard deviations of required educational level, overeducated level and undereducated level are 0.52, 0.37 and 0.37 in the second group.

[24] Since there is a significant difference of wage effects between 1990s and 2000s and results in each wave are only an approximation, so I mainly focus on my analysis by decade.

1990s, most of the three kinds of education variables in the ORU equation are insignificant. However, in the 2000s, coefficients of three education variables become significant and are in line with the existing literature except for higher wage returns to overeducation than wage returns to required education in 2006 in the mean index. Using the mode index still provides more precise results than the mean index in this case.

The most feasible explanation for the significant difference in the wage return to education and wage effects of education mismatch between the 1990s and 2000s is the deepening of economic reform and market improvement. Economic reform is a continuous process and it always needs time to take effects. Zhang et al. (2005) argue that the economic reform in China permeate very slowly and began to take effects until the middle and late 1990s. Thus, before 2000, the influence of old labour market system still existed and education attainment is still not an important role in the wage determination regime, which may result in low wage returns to education in 1990s. In addition, most insignificant education variables in the ORU equation using both indexes in 1990s in Table 2-13 indicate that educational mismatch was not valued importantly in the society in the 1990s because of the still existing centrally-allocated employment system. Secondly, with the increasing education costs and full application of the user-pay system of higher education in the late 1990s (Qian and Smyth, 2008), increased individuals' investment on education may result in larger wage returns to educational mismatch in the 2000s than in the 1990s. Additionally, higher education expansion since 1999, which makes the phenomenon of overeducation become more serious, is another important reason to explain significant and increased wage returns to overeducation in the 2000s than the 1990s. Based on above analysis, the economic transition and its following changes in the labour market and education system that can be reflected through time effects indeed has a big impact on wage returns to education and wage returns to educational mismatch.

Another point that needs to be highlighted in Table 2-13 is that wage returns to required education are higher than wage returns to actual education using both indexes in the 2000s. The excess of the wage return to required education over the wage return to actual schooling by itself suggests that there is a big advantage to correct education and the years of surplus education are not fully rewarded.

2.5.2.4 Wage effects of overeducation in hourly wage

According to the literature, using hourly wages rather than monthly or annual wages may provide more precise estimation of the wage return to education (Li, 2003). Li and Zax (2003) argue that people who own lower level of education tend to work more hours than the people who have higher educational level. That is to say, working hours have a negative relationship with educational level, which will underestimate the wage return to education without controlling for working hours. In the CHNS, information is contained about working hours in a day and working days per week. Therefore, hourly wages can be created to re-run the Mincer equation and ORU equation in this chapter to see if there is any improvement of wage returns to education and wage effects of overeducation. Table 2-14 reports the wage return to years of schooling using both monthly wages and hourly wages. Consistent with our expectation, the wage return to years of schooling using hourly wages in each wave all become significant and are slightly larger than those using monthly wages. In terms of educational mismatch in Table 2-15, patterns of three education variables are consistent with those using monthly wages, but wage returns are larger than results in Table 2-10, which is consistent with Li (2003). If the data of individual working hours is available, using hourly wage rate may be a better choice to explore the wage effects of educational mismatch in the empirical analysis.

2.5.3 Wage effects of overeducation and undereducation in the VV model

Table 2-16 shows the wage effects of overedeucation in the VV equation using the mean index and the mode index. We can see that results from pooled OLS estimation using the mode index (Table 2-16 columns (5) and (6)) are consistent with the existing literature (Sicherman, 1991); (Alba-Ramirez, 1993); (Kiker et al, 1997). Moreover, after controlling for the unobserved heterogeneity shown in Table 2-16 column (7), the return to required education decreases and the wage penalty of overeducated workers disappears, which are very similar to the results in Tsai (2010). However, wage premiums to undereducation increases. In terms of results from the mean index in the VV equation as indicated in Table 2-16 column (2), the wage penalties of overeducation disappears after taking time effects into consideration. After using fixed effects model to control for unobserved heterogeneity, which is shown in Table 2-16 column (3), the wage return to actual years of schooling increases a lot and wage penalties of overeducation even becomes positive compared to the results in column (2). In addition, the wage premium of undereducation disappears. According to the existing literature, results using the mean index in the VV model are not very justifiable.

As indicated in the signaling theory, education is a screening device to help employers assess potential candidates' productivity, which can be measured either by years of schooling or qualifications. Kominski and Siegel (1993) argue that degrees can reflect the reality of the criterion of employment. In addition, professional job analysts usually define required education in educational levels not in years. For example, the Dictionary of Occupational Title (DOT) in the USA regulates required education within each occupation using qualifications (Rumberger, 1987). Based on the results using the mode index in this chapter, we can infer that employers in the Chinese labour market value much more the credential or qualification to judge employees' productivity than years of schooling. Therefore, exploring wage effects of educational mismatch using qualifications can provide more relevant and useful results for the current and future analysis.

Some odd results from the mean index in this chapter may be explained by the fact that in real life, not everyone finishes a given educational level in the same years[25]. For example in the survey, 'the third year upper middle school', people may take thirteen or fourteen years to achieve, not the standard 12 years. Measurement error from years of schooling may bias the results in the mean index to some extent.

[25] The survey asks respondents to answer completed years of formal education in regular school, which is categorised by educational grade.

Table 2-9 Marginal effects of the possibility of being overeducated in both indexes

Variables	In the mean index: Undereducation	In the mean index: Correct education	In the mean index: Overeducation	In the mode index: Undereducation	In the mode index: Correct education	In the mode index: Overeducation
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.0192***	0.0073***	-0.0265***	0.0451***	0.0122***	-0.0572***
	(0.0023)	(0.0010)	(0.0032)	(0.0039)	(0.0011)	(0.0049)
Urban Registration	-0.0096***	-0.0036***	0.0132***	-0.0146***	-0.0039***	0.0186***
	(0.0023)	(0.0009)	(0.0032)	(0.0038)	(0.0010)	(0.0048)
Lower middle school	-0.2733***	-0.1038***	0.3771***	-0.4354***	-0.1175***	0.5530***
	(0.0037)	(0.0083)	(0.0066)	(0.0053)	(0.0067)	(0.0089)
Upper middle school	-0.5181***	-0.1968***	0.7150***	-0.7107***	-0.1918***	0.9025***
	(0.0090)	(0.0145)	(0.0085)	(0.0063)	(0.0103)	(0.0099)
Technical or Vocational	-0.4418***	-0.1678***	0.6096***	-0.7546***	-0.2037***	0.9583***
	(0.0076)	(0.0130)	(0.0105)	(0.0082)	(0.0109)	(0.0118)
University or college degree	-0.6915***	-0.2627***	0.9541***	-0.9478***	-0.2559***	1.2036***
	(0.0129)	(0.0188)	(0.0086)	(0.0103)	(0.0130)	(0.0116)
Master’s degree or higher	-1.0393***	-0.3948***	1.4341***	-1.7666***	-0.4769***	2.2435***
	(0.0229)	(0.0283)	(0.0200)	(0.0272)	(0.0234)	(0.0276)
Experience	0.0009**	0.0003**	-0.0012**	-0.0018***	-0.0005***	0.0022***
	(0.0004)	(0.0001)	(0.0005)	(0.0006)	(0.0002)	(0.0008)
Experience squared	0.0000	0.0000	-0.0000	0.0000***	0.0000***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Private sector	-0.0299***	-0.0113***	0.0412***	-0.1106***	-0.0299***	0.1405***
	(0.0039)	(0.0016)	(0.0053)	(0.0068)	(0.0022)	(0.0084)
Collective sector	-0.0241***	-0.0091***	0.0332***	-0.0601***	-0.0162***	0.0763***
	(0.0039)	(0.0016)	(0.0053)	(0.0059)	(0.0017)	(0.0073)
Unknown ownership	-0.0143*	-0.0054*	0.0197*	-0.0160	-0.0043	0.0204
	(0.0077)	(0.0029)	(0.0107)	(0.0129)	(0.0035)	(0.0163)
Firm size 2 (between 20 and 100 employees)	0.0219***	0.0083***	-0.0302***	0.0518***	0.0140***	-0.0658***
	(0.0033)	(0.0013)	(0.0045)	(0.0056)	(0.0016)	(0.0070)
Firm size 3 (Less than 20 employees)	0.0348***	0.0132***	-0.0480***	0.0706***	0.0191***	-0.0897***
	(0.0038)	(0.0017)	(0.0051)	(0.0067)	(0.0019)	(0.0083)
Unknown firm size	0.0124**	0.0047**	-0.0172**	0.0384***	0.0104***	-0.0488***
	(0.0056)	(0.0022)	(0.0078)	(0.0092)	(0.0025)	(0.0117)
Contractor	-0.0013	-0.0005	0.0018	-0.0348***	-0.0094***	0.0442***
	(0.0036)	(0.0014)	(0.0049)	(0.0059)	(0.0016)	(0.0075)
Temporary	-0.0074*	-0.0028*	0.0102*	-0.0572***	-0.0154***	0.0726***
	(0.0040)	(0.0015)	(0.0055)	(0.0057)	(0.0017)	(0.0072)
Other job type	-0.0029	-0.0011	0.0039	-0.0050	-0.0013	0.0063
	(0.0074)	(0.0028)	(0.0102)	(0.0114)	(0.0031)	(0.0145)

Clerk	0.1411***	0.0536***	-0.1947***	0.2385***	0.0644***	-0.3028***
	(0.0043)	(0.0039)	(0.0044)	(0.0057)	(0.0032)	(0.0064)
Junior	0.0999***	0.0379***	-0.1378***	0.1344***	0.0363***	-0.1707***
	(0.0037)	(0.0028)	(0.0041)	(0.0048)	(0.0017)	(0.0052)
Senior	0.2226***	0.0846***	-0.3072***	0.4182***	0.1129***	-0.5311***
	(0.0070)	(0.0061)	(0.0074)	(0.0099)	(0.0053)	(0.0101)
Leader	0.1418***	0.0539***	-0.1957***	0.2395***	0.0646***	-0.3041***
	(0.0046)	(0.0040)	(0.0052)	(0.0063)	(0.0034)	(0.0072)
Other	0.0188**	0.0071**	-0.0259**	-0.0173	-0.0047	0.0219
	(0.0087)	(0.0034)	(0.0121)	(0.0128)	(0.0035)	(0.0163)
Northeast	-0.0052	-0.0020	0.0072	0.0005	0.0001	-0.0006
	(0.0038)	(0.0014)	(0.0052)	(0.0059)	(0.0016)	(0.0075)
Central	0.0016	0.0006	-0.0022	-0.0017	-0.0005	0.0022
	(0.0033)	(0.0012)	(0.0045)	(0.0051)	(0.0014)	(0.0065)
East	-0.0064**	-0.0024**	0.0089**	-0.0071	-0.0019	0.0090
	(0.0032)	(0.0012)	(0.0045)	(0.0050)	(0.0013)	(0.0063)
1991	0.0156***	0.0059***	-0.0216***	0.0080**	0.0022**	-0.0102**
	(0.0027)	(0.0011)	(0.0037)	(0.0036)	(0.0010)	(0.0046)
1993	0.0364***	0.0138***	-0.0502***	0.0871***	0.0235***	-0.1107***
	(0.0033)	(0.0015)	(0.0044)	(0.0046)	(0.0017)	(0.0058)
1997	0.0353***	0.0134***	-0.0487***	0.1032***	0.0279***	-0.1310***
	(0.0061)	(0.0025)	(0.0083)	(0.0098)	(0.0029)	(0.0123)
2000	0.0522***	0.0198***	-0.0721***	0.1000***	0.0270***	-0.1270***
	(0.0063)	(0.0028)	(0.0086)	(0.0101)	(0.0030)	(0.0127)
2004	0.1162***	0.0441***	-0.1603***	0.1268***	0.0342***	-0.1610***
	(0.0069)	(0.0040)	(0.0092)	(0.0110)	(0.0033)	(0.0138)
2006	0.1273***	0.0483***	-0.1756***	0.2531***	0.0683***	-0.3214***
	(0.0072)	(0.0043)	(0.0096)	(0.0119)	(0.0043)	(0.0145)
2009	0.1184***	0.0450***	-0.1634***	0.2661***	0.0718***	-0.3379***
	(0.0069)	(0.0041)	(0.0092)	(0.0112)	(0.0044)	(0.0137)
Observations	17766	17766	17766	17766	17766	17766
LR chi2		5483.05			11256.21	
Prob > chi2		0.0000			0.0000	
Pseudo R^2		0.7079			0.4901	

*** p<0.10, ** p<0.05, *** p<0.010**

Notes: [1]. The government sector is the benchmark ownership. [2]. Primary school or less is the bench mark education level. [3]. West (province Guangxi, Guizhou) is the bench mark region. [4]. Firms with more than 100 employees is the bench mark firm size. [5]. Permanent is the comparison job type. [6]. Unskilled worker is the bench mark occupation. [7]. 1989 is the base wave.

Table 2-10 Wage effects of overeducation (ORU) ----- mean index VS mode index

	The mean index				The mode index			
Description	Pooled OLS (1)	Pooled OLS with time effects (2)	Fixed effects (3)	Random effects (4)	Pooled OLS (5)	Pooled OLS with time effects (6)	Fixed effects (7)	Random effects (8)
Wage return to required education	0.2324***	0.0280***	0.0175*	0.0271***	0.2620***	0.0773***	0.0555***	0.0787***
	(0.0062)	(0.0060)	(0.0097)	(0.0060)	(0.0079)	(0.0070)	(0.0183)	(0.0071)
Wage return to overeducation	0.0298***	0.0257***	0.0183***	0.0260***	0.0968***	0.0394***	0.0452**	0.0457***
	(0.0040)	(0.0034)	(0.0067)	(0.0033)	(0.0083)	(0.0073)	(0.0179)	(0.0072)
Wage return to undereducation	-0.0382***	-0.0209***	-0.0076	-0.0223***	-0.1319***	-0.0808***	-0.0268	-0.0741***
	(0.0045)	(0.0041)	(0.0082)	(0.0039)	(0.0100)	(0.0087)	(0.0188)	(0.0079)
Year 1991		0.1063***	0.1524***	0.1119***		0.1107***	0.1509***	0.1154***
		(0.0114)	(0.0178)	(0.0118)		(0.0112)	(0.0185)	(0.0116)
Year 1993		0.2461***	0.3140***	0.2500***		0.2446***	0.3018***	0.2472***
		(0.0139)	(0.0293)	(0.0128)		(0.0137)	(0.0319)	(0.0125)
Year 1997		0.7291***	0.8948***	0.7376***		0.7290***	0.8772***	0.7368***
		(0.0306)	(0.0647)	(0.0257)		(0.0303)	(0.0693)	(0.0255)
Year 2000		1.0704***	1.2792***	1.0798***		1.0725***	1.2571***	1.0813***
		(0.0311)	(0.0828)	(0.0265)		(0.0306)	(0.0895)	(0.0257)
Year 2004		1.3285***	1.6654***	1.3564***		1.3215***	1.6292***	1.3477***
		(0.0332)	(0.1074)	(0.0292)		(0.0321)	(0.1185)	(0.0277)
Year 2006		1.4958***	1.8652***	1.5219***		1.4821***	1.8135***	1.5053***
		(0.0343)	(0.1197)	(0.0301)		(0.0330)	(0.1322)	(0.0285)
Year 2009		1.8133***	2.2521***	1.8443***		1.8024***	2.1918***	1.8291***
		(0.0347)	(0.1389)	(0.0303)		(0.0331)	(0.1539)	(0.0283)
R^2	0.5588	0.6510	0.5964		0.5440	0.6525	0.5966	
Observations	17766	17766	17766	17766	17766	17766	17766	17766

*** p<0.10, ** p<0.05, *** p<0.010**

Notes: 1. The government sector is the benchmark ownership. 2. West (province Guangxi, Guizhou) is the bench mark region. 3. Firms with more than 100 employees is the bench mark firm size. 4. Permanent is the comparison job type. 5. Unskilled worker is the bench mark occupation. 6. 1989 is the base wave.

Table 2-11 Wage effects of overeducation (ORU) by age groups -----The mean index

	Post-Mao education				Mao education			
Description	**Pooled OLS (1)**	**Pooled OLS with time effects (2)**	**Fixed effects (3)**	**Random effects (4)**	**Pooled OLS (5)**	**Pooled OLS with time effects (6)**	**Fixed effects (7)**	**Random effects (8)**
Wage return to required education	0.2550***	0.0509***	0.0472	0.0455***	0.2038***	0.0211***	0.0138	0.0214***
	(0.0127)	(0.0144)	(0.0296)	(0.0141)	(0.0070)	(0.0066)	(0.0104)	(0.0067)
Wage return to overeducation	0.0683***	0.0328***	0.0251	0.0364***	0.0319***	0.0287***	0.0185**	0.0283***
	(0.0083)	(0.0075)	(0.0182)	(0.0071)	(0.0045)	(0.0039)	(0.0072)	(0.0038)
Wage return to undereducation	-0.0802***	-0.0413***	-0.0110	-0.0448***	-0.0396***	-0.0192***	-0.0074	-0.0203***
	(0.0120)	(0.0112)	(0.0299)	(0.0107)	(0.0048)	(0.0045)	(0.0086)	(0.0042)
Year 1991		-0.0089	0.1377	0.0284		0.1109***	0.1475***	0.1127***
		(0.1034)	(0.0937)	(0.0703)		(0.0113)	(0.0186)	(0.0121)
Year 1993		0.1791*	0.3374***	0.2013***		0.2371***	0.3008***	0.2371***
		(0.1006)	(0.1166)	(0.0690)		(0.0141)	(0.0311)	(0.0134)
Year 1997		0.7011***	0.9536***	0.7216***		0.6413***	0.8600***	0.6572***
		(0.1055)	(0.1916)	(0.0771)		(0.0404)	(0.0713)	(0.0322)
Year 2000		1.0068***	1.3603***	1.0271***		0.9748***	1.2377***	0.9910***
		(0.1064)	(0.2413)	(0.0789)		(0.0411)	(0.0904)	(0.0333)
Year 2004		1.1946***	1.7088***	1.2268***		1.2594***	1.6299***	1.2903***
		(0.1102)	(0.3070)	(0.0849)		(0.0435)	(0.1167)	(0.0362)
Year 2006		1.3525***	1.9401***	1.3892***		1.4318***	1.8206***	1.4544***
		(0.1116)	(0.3407)	(0.0877)		(0.0445)	(0.1297)	(0.0370)
Year 2009		1.6933***	2.3243***	1.7166***		1.7460***	2.2199***	1.7796***
		(0.1132)	(0.3923)	(0.0888)		(0.0450)	(0.1503)	(0.0376)
R^2	0.5084	0.6019	0.5496		0.5695	0.6500	0.6032	
Observations	3368	3368	3368	3368	14398	14398	14398	14398

*** p<0.10, ** p<0.05, *** p<0.010**

Table 2-12 Wage effects of overeducation (ORU) by age groups -----The mode index

	Post-Mao education				Mao education			
Description	**Pooled OLS (1)**	**Pooled OLS with time effects (2)**	**Fixed effects (3)**	**Random effects (4)**	**Pooled OLS (5)**	**Pooled OLS with time effects (6)**	**Fixed effects (7)**	**Random effects (8)**
Wage return to required education	0.3117***	0.1030***	0.0208	0.0977***	0.2405***	0.0694***	0.0632***	0.0739***
	(0.0154)	(0.0158)	(0.0443)	(0.0159)	(0.0091)	(0.0081)	(0.0202)	(0.0082)
Wage return to overeducation	0.1709***	0.0358**	0.0092	0.0431***	0.0975***	0.0487***	0.0550***	0.0549***
	(0.0164)	(0.0153)	(0.0404)	(0.0145)	(0.0095)	(0.0085)	(0.0200)	(0.0084)
Wage return to undereducation	-0.2124***	-0.1108***	0.0203	-0.1052***	-0.1304***	-0.0761***	-0.0371*	-0.0704***
	(0.0247)	(0.0217)	(0.0483)	(0.0196)	(0.0109)	(0.0095)	(0.0205)	(0.0088)
Year 1991		0.0102	0.1842**	0.0441		0.1124***	0.1374***	0.1137***
		(0.1033)	(0.0916)	(0.0702)		(0.0111)	(0.0197)	(0.0118)
Year 1993		0.2026**	0.4201***	0.2220***		0.2344***	0.2725***	0.2327***
		(0.1005)	(0.1120)	(0.0687)		(0.0139)	(0.0347)	(0.0131)
Year 1997		0.7290***	1.1228***	0.7480***		0.6425***	0.8109***	0.6569***
		(0.1054)	(0.1809)	(0.0764)		(0.0400)	(0.0775)	(0.0320)
Year 2000		1.0463***	1.5959***	1.0637***		0.9757***	1.1716***	0.9907***
		(0.1060)	(0.2272)	(0.0774)		(0.0406)	(0.0995)	(0.0325)
Year 2004		1.2381***	2.0226***	1.2645***		1.2473***	1.5337***	1.2768***
		(0.1089)	(0.2922)	(0.0822)		(0.0426)	(0.1312)	(0.0348)
Year 2006		1.3881***	2.2862***	1.4220***		1.4154***	1.7009***	1.4342***
		(0.1100)	(0.3229)	(0.0841)		(0.0433)	(0.1464)	(0.0355)
Year 2009		1.7351***	2.7281***	1.7555***		1.7306***	2.0789***	1.7587***
		(0.1110)	(0.3730)	(0.0845)		(0.0437)	(0.1702)	(0.0358)
R^2	0.4897	0.6026	0.5489		0.5596	0.6512	0.6035	
Observations	3368	3368	3368	3368	14398	14398	14398	14398

*** p<0.10, ** p<0.05, *** p<0.010**

Table 2-13 Wage returns to education and wage returns to overeducation (ORU) by wave

	1989	1991	1993	1997	2000	2004	2006	2009
			In the mean index					
Wage return to actual years of schooling	0.0097*	0.0119***	0.0074	0.0169***	0.0342***	0.0455***	0.0570***	0.0482***
	(0.0053)	(0.0036)	(0.0050)	(0.0054)	(0.0060)	(0.0056)	(0.0058)	(0.0058)
Wage return to required education	-0.0211	0.0022	-0.0914***	0.0034	0.1140***	0.0723***	0.0591***	0.0776***
	(0.0169)	(0.0116)	(0.0189)	(0.0230)	(0.0211)	(0.0210)	(0.0164)	(0.0154)
Wage return to overeducation	0.0061	0.0133**	0.0198**	0.0235***	0.0200**	0.0508***	0.0741***	0.0475***
	(0.0079)	(0.0055)	(0.0077)	(0.0081)	(0.0091)	(0.0093)	(0.0101)	(0.0102)
Wage return to undereducation	-0.0188*	-0.0113*	-0.0171*	-0.0057	-0.0223**	-0.0433***	-0.0439***	-0.0365***
	(0.0100)	(0.0067)	(0.0090)	(0.0097)	(0.0108)	(0.0093)	(0.0099)	(0.0099)
			In the mode index					
Wage return to actual educational level	0.0257**	0.0273***	0.0132	0.0451***	0.0781***	0.0984***	0.1159***	0.1098***
	(0.0124)	(0.0085)	(0.0119)	(0.0124)	(0.0137)	(0.0123)	(0.0130)	(0.0129)
Wage return to required education	-0.0284	-0.0048	-0.0794***	0.0278	0.1604***	0.1381***	0.1263***	0.1483***
	(0.0362)	(0.0257)	(0.0219)	(0.0225)	(0.0247)	(0.0234)	(0.0189)	(0.0185)
Wage return to overeducation	0.0286	0.0268**	0.0343*	0.0442**	0.0550***	0.0871***	0.1018***	0.0416**
	(0.0188)	(0.0121)	(0.0199)	(0.0204)	(0.0202)	(0.0175)	(0.0207)	(0.0196)
Wage return to undereducation	-0.0354	-0.0386**	-0.0319*	-0.0543**	-0.0710***	-0.1004***	-0.1210***	-0.1448***
	(0.0222)	(0.0165)	(0.0189)	(0.0214)	(0.0259)	(0.0244)	(0.0182)	(0.0182)

*** p<0.10, ** p<0.05, *** p<0.010**

Table 2-14 Wage returns to years of schooling using average monthly wages and hourly wages

	1989	1991	1993	1997	2000	2004	2006	2009
Log monthly wages								
Wage return to years of schooling	0.0097*	0.0119***	0.0074	0.0169***	0.0342***	0.0455***	0.0570***	0.0482***
	(0.0053)	(0.0036)	(0.0050)	(0.0054)	(0.0060)	(0.0056)	(0.0058)	(0.0058)
R^2	0.0877	0.2218	0.1615	0.1504	0.1083	0.2666	0.2642	0.2698
Observations	2797	2769	2363	2194	2014	1757	1843	2029
Log hourly wages								
Wage return to years of schooling	0.0147***	0.0147***	0.0126**	0.0243***	0.0410***	0.0542***	0.0612***	0.0583***
	(0.0055)	(0.0037)	(0.0051)	(0.0058)	(0.0067)	(0.0064)	(0.0063)	(0.0064)
R^2	0.1251	0.2054	0.1504	0.1309	0.1152	0.2940	0.3175	0.3172
Observations	2770	2750	2304	2146	1955	1737	1827	2012

*** p<0.10, ** p<0.05, *** p<0.010**

Table 2-15 Wage returns to overeducation using hourly wages --- ORU equation

Description	Pooled OLS	Pooled OLS with time effects	Fixed effects	Random effects
		The mean index		
Wage return to required education	0.2525***	0.0539***	0.0248**	0.0505***
	(0.0064)	(0.0064)	(0.0106)	(0.0064)
Wage return to overeducation	0.0341***	0.0300***	0.0222***	0.0324***
	(0.0041)	(0.0035)	(0.0073)	(0.0036)
Wage return to undereducation	-0.0433***	-0.0265***	-0.0130	-0.0293***
	(0.0046)	(0.0042)	(0.0089)	(0.0042)
R^2	0.5732	0.6536	0.5913	
Observations	17501	17501	17501	17501
		The mode index		
Wage return to required education	0.2908***	0.1099***	0.0628***	0.1104***
	(0.0083)	(0.0075)	(0.0199)	(0.0076)
Wage return to overeducation	0.1083***	0.0510***	0.0441**	0.0607***
	(0.0085)	(0.0076)	(0.0195)	(0.0077)
Wage return to undereducation	-0.1402***	-0.0901***	-0.0287	-0.0875***
	(0.0102)	(0.0089)	(0.0204)	(0.0085)
R^2	0.5590	0.6552	0.5915	
Observations	17501	17501	17501	17501

*** p<0.10, ** p<0.05, *** p<0.010**

Table 2-16 Wage effects of overeducation (VV) -----The mean index and the mode index

	The mean index				The mode index			
Description	**Pooled OLS (1)**	**Pooled OLS with time effects (2)**	**Fixed effects effects (3)**	**Random effects (4)**	**Pooled OLS (5)**	**Pooled OLS with time effects (6)**	**Fixed effects (7)**	**Random effects (8)**
Wage return to education	0.1141***	0.0300***	0.2767***	0.0286***	0.2393***	0.0831***	0.0509***	0.0826***
	(0.0040)	(0.0035)	(0.0590)	(0.0035)	(0.0076)	(0.0068)	(0.0176)	(0.0066)
Overeducated	-0.2400***	0.0004	0.0399**	0.0126	-0.2033***	-0.0513***	-0.0064	-0.0445***
	(0.0177)	(0.0156)	(0.0190)	(0.0147)	(0.0140)	(0.0122)	(0.0158)	(0.0118)
Undereducated	0.2257***	0.0483***	0.0199	0.0388**	0.1486***	0.0285**	0.0427***	0.0331***
	(0.0185)	(0.0166)	(0.0235)	(0.0154)	(0.0138)	(0.0124)	(0.0158)	(0.0114)
Year 1991		0.1089***	-0.3552***	0.1138***		0.1112***	0.1526***	0.1160***
		(0.0113)	(0.1131)	(0.0116)		(0.0112)	(0.0185)	(0.0116)
Year 1993		0.2469***	-0.7273***	0.2503***		0.2429***	0.3069***	0.2466***
		(0.0136)	(0.2305)	(0.0125)		(0.0136)	(0.0318)	(0.0124)
Year 1997		0.7328***	-1.2205***	0.7405***		0.7271***	0.8844***	0.7362***
		(0.0304)	(0.4681)	(0.0254)		(0.0302)	(0.0692)	(0.0254)
Year 2000		1.0754***	-1.6294**	1.0839***		1.0707***	1.2668***	1.0809***
		(0.0307)	(0.6431)	(0.0257)		(0.0306)	(0.0894)	(0.0257)
Year 2004		1.3255***	-2.3024***	1.3532***		1.3177***	1.6427***	1.3464***
		(0.0324)	(0.8765)	(0.0279)		(0.0321)	(0.1184)	(0.0277)
Year 2006		1.4927***	-2.6264***	1.5186***		1.4735***	1.8329***	1.5009***
		(0.0329)	(0.9922)	(0.0283)		(0.0328)	(0.1318)	(0.0282)
Year 2009		1.8121***	-3.0427***	1.8420***		1.7932***	2.2136***	1.8241***
		(0.0330)	(1.1691)	(0.0282)		(0.0330)	(0.1535)	(0.0281)
R^2	0.5390	0.6518	0.5972		0.5417	0.6526	0.5966	
Observations	17766	17766	17766	17766	17766	17766	17766	17766

*** p<0.10, ** p<0.05, *** p<0.010**

2.6 Conclusion and implications

This chapter explores the phenomenon of overeducation in the Chinese labour market using CHNS data from 1989 to 2009. Specifically, the three research questions presented in the first chapter (page 7) are answered. Firstly, the extent of overeducation and undereducation in China in two indexes of defining required education is different. In the mean index, about 18.19% of workers in our sample are treated as overeducated and 20.33% employees have deficit education. While in the mode index, the incidence of overeducation is 26.10% and 30.16% of workers are estimated as undereducated. Males have higher incidence of overeducation than females in both indexes. However, in the mean index, males have higher incidence of undereducation than females.

Second, the results from the ordered probit model in both indexes reveal the determinants of overeducation in China. The results indicate that males and workers who have urban Hukou are more likely to be estimated as overeducated in the Chinese labour market. People who work in firms with between 20 and 100 employees and in firms with less than 20 employees are less likely to be estimated as overeducated than those individuals who work in firms with more than 100 employees, which is confirmed in both indexes. Consistent results that people who work in the private sector are more likely to be overeducated than individuals in the government sector can be found in both indexes. In addition, only results in the mean index confirm that workers who have less experience tend to be overeducated. Individuals in the East region are more likely to be estimated as overeducated than the west region only in the mean index.

Previous studies employ cross-sectional data to explore wage effects of overeducation in China, which has been criticised for ignoring time effects and unobserved heterogeneity. The answer to the third question of the wage effects of overeducation in China is addressed in this chapter by making a longitudinal analysis of the wage effects of overeducation, taking time effects and unobserved heterogeneity into consideration. In this chapter, four models (pooled OLS regression, pooled OLS regression with time effects, fixed effects model and random effects model), two measurement methods of required education (the mean index and mode index) and two equations (VV equation and ORU equation) are employed to explore wage effects of overeducation in China.

Based on pooled OLS analysis, similar patterns of wage effects of overeducation from the mean index and mode index in two equations echo the point of view that different definitions of required education conduct similar results of wage effects of overeducation. In addition, time effects indeed have a big impact on the wage return to overeducation and undereducation. Although time effects change the magnitude of wage effects, the patterns of estimation results are still consistent with previous findings that educational mismatch causes wage differentials. The exploration of wage effects of overeducation by wave is also conducted in this chapter and empirical results suggest that economic transition and its following changes in the labour market and education system in China can be reflected through time effects. In addition, this chapter also investigates wage effects of overeducation by age groups. Results of wage effects of overeducation from pooled OLS estimation using the mode index not only confirm the main conclusions of the existing literature, but also show different pictures of wage effects of overeducation between Post Mao and Mao education systems.

As expected, taking unobserved heterogeneity into account, empirical results in this chapter indicate that wage penalty of overeducation becomes smaller or even disappears, which can be confirmed by the mode index in the VV equation. It seems that individual heterogeneity plays a very important role in the analysis of wage effects of overeducation in the Chinese labour market. We can say that wage penalty of overeducated population may attribute to low ability to some extent. The following recommendations regarding improving ability should be taken into consideration:

First, higher education institutions should provide students more opportunities to gain relevant work experience or work placements during their studies. Through those occupational experiences, students can know the actual working process and accordingly, they will supplement and adjust their personal skills related to the market needs, which can improve their employability and reduce the possibility of finding a mismatched job. Good examples are from “Apprenticeship” in England and the “Dual-system” in Germany. Although there are some apprenticeship programmes in China, they are all applied in vocational education. We can also import workplace training into university or higher level. In addition, higher education institutions should strengthen the relationship and cooperation with enterprises to create more off-campus employment practice bases to supply work placements and internships to students. We can also set educational institutions-owned enterprises by way of joint-stock to fully use the advantages of human capital and technical support in education system. This method can not only provide more funding to higher education institutions, but also offer job positions and working experience to students.

Second, improving the quality of teaching is essential. More funding should be provided to support the on-the-job training of teachers. On-the-job training can equip teachers with the most updated knowledge and techniques in a concordance with the needs of the market to improve their ability to cultivate students. On the other hand, we can recruit experts with working experience outside academia who can bring practical knowledge into teaching as teachers.

Results in section 2.5.1 imply that individuals who have urban registration are more likely to be estimated as overeducated compared to their rural registration counterparts. This motivates us to make a comparison study of overeducation between urban residents and rural migrant workers in the urban labour market, which will be presented in Chapter 4.

Chapter 3 Educational mismatch, skill mismatch and job satisfaction

3.1 Introduction

The match between skills offered by the workforce and skills needed by the labour market has been a particular concern of policy-makers and society in recent years. In the World Economic Forum Annual Meeting 2014 in Davos, the World Economic Forum's Global Agenda Council on Employment presented a report to address the importance of skill mismatch issues across the world after the global economic crisis[26]. The skill mismatch problem also affects China. In the current Chinese labour market, three salient features regarding employment need to be examined: (1) the supply of graduates exceeds the labour market's needs. Since the higher education expansion in China in 1999, the number of graduates has increased from 1.55 million in 1999 to 6.82 million in 2011[27]. According to the *China Statistical Yearbook 2014*, there are 7.27 million graduates surging into the labour market, which is the highest number in history. This feature is often recognised as one of the causes of overeducation, which is also mentioned in Chapter 2. (2) Some firms and factories have reported that it is hard for them to hire suitable workers, especially in expanding service industries, like banking and telecommunication (OECD, 2015). (3) Skills processed by employees fail to satisfy the employers' needs (Molnar et al., 2015).

Skill mismatch occurs when an individual's skills are not consistent with the skills required by the job. Skill mismatch can bring significant a cost to employers (firms), employees and the whole country. For employers, skill mismatch can reduce productivity and lead to high turnover rate of employees. For employees, skill mismatch may entail low wages, low job satisfaction and unfulfilled career expectations. For a given country, skill mismatch may result in reduced productivity efficiency and a decreased growth rate of GDP (Desjardins and Rubenson, 2011).

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[26] Matching Skills and Labour Market Needs: Building Social Partnerships for Better Skills and Better Jobs. http://www3.weforum.org/docs/GAC/2014/WEF_GAC_Employment_MatchingSkillsLabourMarket_Report_2014.pdf.

[27] Detailed figures of college enrollment rate in China from 1999 to 2011 can be seen in Chapter 2 Table A1.

Most literature on mismatch uses educational mismatch (overeducation and undereducation) to represent skill mismatch because it is convenient to collect data of years of schooling and qualifications (Hartog, 2000); (Dolton and Vignoles, 2000); (Groot and Maassen Van Den Brink, 2000). If the acquired years of schooling are higher than the required educational level of his job, a person is estimated as “overeducated”. In contrast, workers are considered to be undereducated if their actual educational years are lower than the required education for their jobs. The possible reasons for the existence of overeducation in the literature are the increased supply of graduates (Freeman, 1976), imperfect information and career mobility (Hartog, 2000), and compensation for other skills and abilities (Dolton and Vignoles, 2000).

The relationship between overeducation and wages is widely investigated in the existing literature. Empirical evidence has indicated that overeducated individuals incur wage penalties when compared to people who have a similar educational level but are correctly matched. However, employees who have a higher educational level than the required educational level for their jobs have higher wage compared to those who work in the same job but are estimated as matched. Both returns to required education and surplus education are positive, but returns to required education are higher than returns to surplus education (Duncan and Hoffman, 1981); (Hartog, 1985); (Rumberger, 1987); (Alba-Ramirez, 1993). In addition, overeducation is a serious concern for organisations. Many researchers have found that overeducated people show more job dissatisfaction (Tsang and Levin, 1985), experience higher rates of absenteeism and are more likely to switch jobs (Sheppard and Herrick, 1972). As a result, production costs of companies may increase due to the reduced work effort of overeducated employees, which implies that there should be a negative relationship between overeducation and productivity. That is to say, overeducated people may behave in counterproductive ways. Considering the potential costs of overeducation, firms may avoid employing overeducated candidates (Tsang and Levin, 1985).

Although education or qualification data is easy to acquire and can measure generic skills to some extent, it doesn’t measure detailed skill categories needed for jobs, like literacy skills, numeric skills and management skills, and it doesn’t take the development of skills over the life cycle into consideration (Desjardins and Rubenson, 2011). Recent studies suggest that educational mismatch and skill mismatch are two distinct concepts (Green and McIntosh, 2007). Some researchers have begun to shift their research interests towards employing skill mismatch (skill surplus and skill deficit) to investigate mismatch issues in the labour market (Allen and De Weert, 2007); (Mavromaras et al., 2013). If taking skill mismatch into consideration, many existing links between educational mismatch and labour market outcomes, such as wages and job satisfaction, need to be revisited (Allen and Van der Velden, 2001); (Badillo-Amador and Vila, 2013).

Throughout the literature, the overall analysis of job satisfaction in China is very limited due to the absence of data on job satisfaction. Moreover, in comparison to other fields of overeducation research, there is no study that explores the relationship between educational mismatch and job satisfaction in China currently. However, a new dataset, the Chinese General Social Survey (2008), provides a range of job satisfaction measures, which enables us to explore the determinants of overall and specific aspects of job satisfaction and investigate detailed links between overeducation and undereducation and job satisfaction. For example, not only do we focus upon overall job satisfaction, we also investigate satisfaction with: salary, welfare, workload, working conditions and facilities, the relationship with colleagues, the relationship with the boss, commuting distance to job location and housing benefits [28]. This analysis is a contribution to the overeducation literature in China. In addition, the existing literature regarding overeducation states that overeducated individuals have wage penalties compared to matched workers but they fail to control for skill mismatch. To our knowledge, only Molnar et al. (2015) present detailed analysis of skill mismatch in China[29]. In this chapter, the availability of data on skill mismatch allows us to take both educational mismatch and skill mismatch into consideration simultaneously to explore the corresponding effects on job satisfaction.

This chapter seeks to answer the following questions: first, what are the determinants of overall job satisfaction? Second, whether or not overeducation reduces overall job satisfaction and if so whether a negative relationship can be applied to different aspects

[28] Housing benefits include monetarisation of housing subsidies and rent subsidies. The subsidy level is varied among provinces and cities in China (Lee, 2000).

[29] Five broad skill categories are analysed in Molnar et al. (2015), which includes practical skills, analytical skills, managing skills, critical thinking and communication skills.

of job satisfaction. Third, does skill mismatch or educational mismatch play an important role in explaining individuals' job satisfaction?

Empirical results in this chapter indicate that educational overeducation may not result in negative effects on job satisfaction as a priori expectations and skill mismatch is a better indicator to explain job dissatisfaction in the Chinese labour market. This chapter provides strong evidence that improving skill match efficiency should be the main concern of policy makers if China desires sustainable economic growth in the future. It is good to see that the Chinese government has realised the negative effects of skill mismatch to some extent. A series of policies have been issued to tackle skill mismatch problems in recent years, for example, The *Outline of China's National Plan for Medium and Long-term Education Reform and Development 2010-2020 and* the *Opinion on Piloting a Modern Apprenticeship System in August 2014* (Molnar et al., 2015). This chapter also echoes the ambition of the Chinese government to strengthen the development of vocational education and training in China in the future.

The remainder of the chapter is constructed as follows. Section 3.2 provides a detailed summary of the literature related to this topic. In section 3.3 and section 3.4, I will explicitly introduce the data and econometric methods used in the analysis. Section 3.5 explores the determinants of overall job satisfaction in the Chinese labour market and also investigates the relationship among overall job satisfaction and eight aspects of job satisfaction, educational mismatch and skill mismatch. Finally, the section 3.6 presents a discussion and conclusion.

3.2 Literature review

3.2.1 The concept of job satisfaction

One of the most interesting notions in social science is job satisfaction. Locke (1976) offers a comprehensive and systematic review of the literature on job satisfaction regarding the concept, causes and effects of job satisfaction from the aspect of psychology. Argyle (1987) treats job satisfaction as one of the three most important predictors of overall well-being, the remaining two being marriage and family satisfaction. Lévy-Garboua and Montmarquette (2004) argue that job satisfaction shows people's attitudes toward their job experience and also can be treated as an indicator to examine whether employees would choose the same job again if opportunity available. Hamermesh (1999) argues that job satisfaction reflects employees judgment about job characteristics and can be used as an index to make comparisons with other potential job market opportunities. Job satisfaction also reflects the extent people favour their work (Millan et al., 2013). Moreover, job satisfaction allows economists to have a better understanding of the fundamental concept of aggregate well-being than job earnings, which is a one-sided criterion to judge well-being (Heywood et al., 2009). However, job satisfaction is a concept that has been rarely considered in economics. Although job satisfaction data is easy to collect in surveys, the process of classifying job satisfaction varies with individuals. That is to say, people may have different interpretations of scales of job satisfaction answers. Many economists argue that job satisfaction reflects people's subjective judgment, which may generate a meaningless figure in economic analysis. Nevertheless, psychologists and sociologists have used job satisfaction data for many years and the validity of survey questions has been tested thoroughly, which indicates that useful information is indeed contained in the questions on job satisfaction (Blanchflower and Oswald, 1999). Freeman (1978) argues that subjective variables like job satisfaction indeed convey useful and important information for us to understand and predict people's occupational choice and behaviours.

Recently, economists have treated self-reported job satisfaction as a useful tool to explore labour market behaviours, such as productivity, quits and absenteeism (Hulin et al., 1985); (Johns and Xie, 1998); (Gazioglu and Tansel, 2006). Clark et al. (1998) find that people who are not satisfied with their work are more likely to have higher absenteeism and a higher possibility of quitting than individuals who have high level of job satisfaction. It is easy to understand that dissatisfied workers try to change jobs or workplaces in order to get job satisfaction (Kickul et al., 2004). High job satisfaction is related to positive performance within a firm (Ostroff, 1992); (Freeman et al., 2008). Seo et al. (2004) find that job satisfaction has a positive link with employees' perception of their quality of life. The above evidence provides feasible reasons why job satisfaction should not be ignored by economists.

3.2.2 The measurement of job satisfaction

There are two ways to explore job satisfaction data. The first is the One-dimension method, which can also be called the global measure of job satisfaction, which is commonly used in studies by economists. It requires respondents to take a whole assessment of their job (Nielsen and Smyth, 2008). Most researchers adopt direct self-reporting methods to measure overall job satisfaction. There are generally two kinds of questions asked in the surveys to respondents. The format of answers is measured in ordered scales rather than cardinal scales in the first category. For example, in the British Household Panel Survey (BHPS), individuals are asked "All things considered, how satisfied or dissatisfied are you with your present job satisfaction using the same 1-7 scale? The answers are given a number from 1 to 7, where a value 1 representing "not satisfied at all" and a value 7 corresponding to "completely satisfied"[30]. In addition, the data on job satisfaction in the German Socioeconomic Panel (GSOEP) are scaled broader than those in BHPS, where respondents are given answers ranging from 0 (very dissatisfied) to 10 (very satisfied)[31]. Another kind of question asks respondents to reply to the job satisfaction question with *yes, no or unknown*. For example, Johnson and Johnson (2000) employ job satisfaction questions from a two-wave panel study of members of a Midwestern American Postal Workers Union local, where individuals were asked to reply with *yes, no or cannot decide.*

A job consists of complex tasks, roles, responsibilities and rewards (Locke, 1976). If we want to get a thorough understanding of the job itself, we need to analyse its constituent elements. The other method is called the multidimensional method, which asks respondents to report job satisfaction for some particular aspect of their job. For example, Clark (1996) employs the British Household Panel Survey (BHPS) to explore job satisfaction data from seven aspects: promotion prospects, total pay, relations with supervisors, job security, ability to work on their own initiative, the actual work itself, and hours of work. In addition, the Triple Audit Opinion Survey (TAOS) in United States asks respondents to rate their degree of satisfaction from 25 aspects of the job (Lee and Wilbur, 1985).

Both methods have advantages and drawbacks. The global measure enables respondents to judge job satisfaction on all kinds of job characteristics. Clark (1998) argues that overall job satisfaction data indeed make a good summary of the information respondents want to convey from their jobs. However, the one-dimension job

[30] The detailed job satisfaction question of BHPS comes from Clark (1996).
[31] The detailed job satisfaction question of GSOEP comes from Hamermesh (1999).

satisfaction approach is often criticised in that it does not provide detailed information regarding satisfaction from different job dimensions. Moreover, empirical analysis indicates that the whole job satisfaction approach is not equivalent to the multidimensional job satisfaction measurement (Scarpello and Campbell, 1983). It is widely recognised that employees may have different attitudes towards different aspects of the job, for example, employees may be satisfied with the salary of their jobs, but dissatisfied with the relationship with colleagues. Therefore, the multidimensional method can give us a clear picture of job satisfaction and provides useful information to managers to identify advantages and weakness to improve performance. However, the job owns a number of aspects and due to the design limitation, some useful information will be missed when transforming facet-specific job satisfaction to overall job satisfaction (Kalleberg and Vaisey, 2005).

Generally, the principal to choose the measurement approach is based upon the application and also data availability. In terms of application, policy makers may be interested in overall job satisfaction data because they may be interested in observing changes of job satisfaction over time (Scarpello and Campbell, 1983). However, for enterprises, they place more attention on multidimensional job satisfaction data, which can be used to explore why employees quit their jobs or to improve job satisfaction of employees. Some researchers employ factor analysis to reduce the number of job satisfaction variables (Schwochau, 1987); (Brown and McIntosh, 1998).

3.2.3 Determinants of job satisfaction

Employers always expect their employees to have high satisfaction with their job, because job satisfaction is a very important index to indicate employees' labour market behaviour, such as productivity, quits and absenteeism. Thus, it is very important to explore the determinants of job satisfaction. According to Clark and Oswald (1996), an individual's life utility function is defined as follows:

$$V=v(\mu, \ddot{u}) \tag{1}$$

where v represents a function of an individual's life utility and consists of μ, utility from work and ü, utility from other aspects of life. The utility from working is measured in the following form:

$$\mu=\mu(y, i, j,) \quad (2)$$

where y is an individual's wage, i and j are individual and job characteristics. Equation (2) is a standard economic model to explore determinants of job satisfaction. According to the economic literature, the determinants of job satisfaction have revealed many consistent and robust findings. However, the above empirical analysis of job satisfaction is based on the hypothesis that wages are exogenous in the regression.

Pay (Salary)

Most individuals spend a quarter of their life time in paid work. When you ask people reasons why they choose to work, the majority of them would prefer money as their answers (Jurgensen, 1978). Therefore, pay is a very important factor for people to measure their current job itself and related characteristics, such as quit, absenteeism and job satisfaction. It is easy to understand that those who are paid more should report higher job satisfaction. However, theoretically, pay can have either a positive or negative relationship with job satisfaction. On one hand, high pay has a positive impact on satisfaction with pay[32]. According to a meta-analysis of the relationship between pay and job satisfaction conducted by Judge et al. (2010), higher pay leads to higher job satisfaction. However, self-determination theory states that extrinsic rewards, such as pay, will sometimes undermine employees' autonomy when employees have different viewpoints with employers and thus reduce people's motivation and degree of satisfaction (Deci and Ryan, 2000).

In addition, there is an argument whether absolute or relative earnings are relevant in the relationship between pay and job satisfaction. According to Rees (1993), a worker's utility is decided by his or her own wage and working hours without comparing with others based on neo-classical wage theory. Gazioglu and Tansel (2006) find that the relationship between absolute pay and job satisfaction is significantly positive. However, many scholars suggest that relative earnings play an important role to determine job satisfaction (Clark and Oswald, 1996); (Meng, 1990); (Sloane and Williams, 2000). Ngoc et al. (2003) conclude four ways to measure relative earnings or income: (1) the earnings gap between individuals and those people who made the same

[32] Satisfaction with pay is one of the most important determinants of overall job satisfaction.

investment at the same time as them; (2) employees may compare themselves with an internal reference group to create expectations[33]; (3) individuals in a given job at time *T* may make a comparison with people who have same job at time *T-1*; (4) the difference between expected income made by the individual and the actual outcome earnings.

Gender

According to the literature, the most persistent finding is the relationship between gender and job satisfaction (Brown and McIntosh, 1998). After controlling for a large set of individual and job characteristics, women are found to be happier with their jobs overall than men (Clark, 1996); (Clark, 1997); (Sloane and Williams, 2000). This finding is not only examined in Europe and the USA, but also explored in other countries, for example, Canada (Murray and Atkinson, 1981), China (Loscocco and Bose, 1998), Singapore (Goh et al., 1991). There are mainly three plausible explanations. The first one is that men and women do different types of work according to their personal characteristics and qualifications (Clark, 1996). The second reason is that men and women value different aspects of their job when they evaluate job satisfaction. For example, men treat earnings and responsibility as the most important factors while women consider their relationship with co-workers and supervisors more important than men do (Konrad et al., 2000). However, Clark (1997) argues that those individuals who treat earnings as the most important determinant of job satisfaction report lower job satisfaction. The third reason is called the participation effect (Clark, 1996). Dissatisfied women workers may find it easier to leave the labour market than men and more satisfied women stay in the labour market, which may create a selection problem (Clark, 1996). Despite the above reasons, Clark (1997) uses wave 1 of the British Household Panel Survey (BHPS) to explore the relationship between gender and job satisfaction, and finds that women report higher job satisfaction than men after controlling for a large number of individual and job characteristics. Through empirical analysis, he claims that the main reason to explain higher job satisfaction amongst women is that they have lower expectations. Not because men and women do different jobs or by sample selection, but rather that, women's jobs were worse in the past and thus they expect less from their current job (Clark, 1997). In addition, Bender et al. (2005) argue that some unmeasured characteristics that women value may exist in the

[33] McBride (2001) suggests that parents and other relatives can be employed as internal reference groups.

given job if women report higher job satisfaction.

Age

According to life cycle and career stage models, employees in different stages of their career may have different attitudes towards their jobs and thus have different levels of job satisfaction (Lee and Wilbur, 1985). Therefore, age is a very important determinant of job satisfaction. There are basically three kinds of views in the literature regarding the relationship between age and job satisfaction. The first one is that the relationship between age and job satisfaction is U-shaped (Clark et al., 1996); (Clark, 1996); (Clark and Oswald, 1996). Gazioglu and Tansel (2006) find that job satisfaction is higher for the youngest and oldest workers than those middle aged groups. The second finding is that job satisfaction increases with age, namely a positive relationship (Hulin and Smith, 1965); (Lee and Wilbur, 1985); (Martin and Shehan, 1989). The third one is that there is a negative relationship between age and job satisfaction (Mora et al., 2007).

Education

Education plays a very important role in the study of labour market behaviour. Sufficient evidence indicates that individuals with higher levels of education earn more, are less likely to experience unemployment and can find better jobs than less-educated people (Card, 1999). The most important motivation for acquiring high educational attainment is to a do satisfying job (Glenn and Weaver, 1982). Better educated people may have an advantage to find jobs with more intrinsic and extrinsic rewards and at the same time, both rewards may result in higher job satisfaction. Based on above, the predicted relationship between education and job satisfaction should be positive. Martin and Shehan (1989) and Cheng et al. (2014b) all find a positive relationship between education and job satisfaction. Blanchflower and Oswald (1999) also find that education has a positive impact on reporting high job satisfaction. However, when controlling for income, the coefficient on years of education changes from being significantly positive to insignificantly negative, which is similar to the findings from Clark and Oswald (1996). Other studies suggest that the correlation between education and job satisfaction is negative. For example, Clark (1996) argues that the higher the level of education, the lower the reported satisfaction level. The reason behind it is that higher educated people have higher expectations for their jobs than less educated people. Unsatisfied expectations may lead to negative relationship between education and job satisfaction.

Bender et al. (2005), Clark (1997), Brown and McIntosh (1998) and Gazioglu and Tansel (2006) all find a negative relationship exists between education and job satisfaction. Nonetheless, Glenn and Weaver (1982) argue that education can have either a positive or a negative effect on job satisfaction. That is to say, some specific individuals may have a strong positive effect offsetting those who have a negative effect and thus leading to a positive effect in the aggregate data and *vice versa*. Therefore, Glenn and Weaver (1982) suggest that separate analysis for different groups of people is necessary. For instance, those people with college degree who value extrinsic rewards most may report low job satisfaction if their expectations about extrinsic rewards are not fulfilled in the jobs. However, other individuals with college degree prefer to do interesting jobs rather than pursuing high earnings. It is possible that the impact of education on job satisfaction may be positive. In light of above findings, the relationship between education and job satisfaction is a matter of empirical investigation.

Health

It is not surprising that individuals with poor physical health could report low job satisfaction. Clark (1996) argues that workers in poor health status are more likely to find jobs with low job satisfaction level and they also tend to be unsatisfied with every aspect of life. Clark (1997), Bender et al. (2005), Gazioglu and Tansel (2006) and Cheng et al. (2014b) all report that a health problem may be detrimental to levels of job satisfaction.

Marital status

Clark (1996) suggests that married employees report the highest job satisfaction than those single individuals (non-married). The reason behind this is that married people are generally happier than single individuals. Clark (1997) reported that marriage is a significant determinant of overall job satisfaction for women but not for men. However, results from Gazioglu and Tansel (2006) indicate that married people are less satisfied than single individuals. Single people can be considered as independent individuals and are easier to make a balance between work and home commitment than married workers (Brown and McIntosh, 1998).

Establishment size

Employees in larger firms are generally found to be less satisfied than those in smaller establishments (Idson, 1990). Clark (1996) and Gazioglu and Tansel (2006) also find similar results. Martin and Shehan (1989) only find a significantly negative relationship between establishment size and job satisfaction for men. Clark (1996) argues that small establishments attract employees by providing attractive intrinsic rewards, which increases job satisfaction for those who value such job attributes.

Job type

According to the existing literature, the relationship between job type and overall job satisfaction is mixed. Shockey and Mueller (1994) argue that full-time workers are more likely to report higher job satisfaction than part-time workers. The reason behind it is that the working conditions of full-time workers allow for more autonomy and task varieties than part-time workers. Thus, they have higher satisfaction and commitment to their employers (Shockey and Mueller, 1994). Eberhardt and Shani (1984) argue that higher job satisfaction in part-time employees is due to the comparison group choosen. Part-time workers with sick pay and job benefits usually compare themselves with other part-time workers without job benefits. Logan et al. (1973) suggest that the overall job satisfaction of full-time workers and part-time employees are alike. However, these two groups have different attitudes towards facets of job satisfaction. For example, part-time workers report higher job satisfaction with their pay and their relationship with co-workers. Full-time workers are more responsive to satisfaction with promotion opportunities (Logan et al., 1973).

Work unit type

Bogg and Cooper (1995) find that senior civil servants in the public sector in the UK experience higher level of job dissatisfaction and higher mental stress than people in the same job level in the private sector, which may be explained by longer working hours, poorer pay and less job autonomy in the public sector. Steel and Warner (1990) suggest that after controlling for a variety of characteristics, employees in the public sector indicate higher job satisfaction than their counterparts in the private sector. However, their study only focuses on young labour participants, who are not representative of all employees. DeSantis and Durst (1996) argue that the determinants of job satisfaction and the reward system are different in the public and private sector. It is better to explore these two groups separately in terms of job satisfaction. Markovits et al. (2007) state that public sector employees report higher extrinsic job satisfaction (pay and fringe benefits) than their counterparts in the private sector in Greece.

Other significant determinants of job satisfaction have been observed including union membership (Borjas, 1979), working hours (Bartel, 1981); (Clark and Oswald, 1996) and training opportunities (Gazioglu and Tansel, 2006).

3.2.4 Job satisfaction in China

Spector (1997) argues that different countries and cultures may exhibit different extent and patterns of job satisfaction. Most existing studies of job satisfaction in China focus on some particular groups and firms of a particular ownership type (Nielsen and Smyth, 2008), unlike the analysis of job satisfaction in the whole countries (Green and Tsitsianis, 2005), which has tended to focus on representative sample of the underlying population.

In terms of specific groups, for example, Sargent and Hannum (2005) explore the factors influencing teacher satisfaction at the community, school and individual levels. Lu et al.(2007) report that more than half of surveyed nurses were satisfied with their current jobs, which is in contrast to popular beliefs. Wang et al. (2013) mainly focus their attention on migrant workers in China employing a migrant survey from Guiyang city. They find that the new generation of migrants has higher job satisfaction than the old generation, which is in contrast to the expected result. Working conditions play an important role in determining job satisfaction among new generations of migrants rather than personal characteristics, such as income, age and gender. Apart from this, differences in family characteristics also contribute to the job satisfaction differential between the two generations of migrant workers. In addition, Cheng et al. (2014b) explore the determinants of job satisfaction of urban locals, first and new generation migrants in urban China using the Chinese General Social Survey (CGSS) 2008, which includes data across 29 provinces and municipalities in China. Results in this study indicate that the new generation migrant workers show lower job satisfaction than that of the old generation migrant workers and urban locals.

Studies of job satisfaction confined to specific ownership types including Leung et al. (1996) and Scott et al. (2003). Leung et al. (1996) focus on joint venture hotels in China to explore the relationship between justice and job satisfaction[34]. It is interesting to see that Chinese employees working with management groups composed by overseas Chinese and Japanese report lower job satisfaction than their counterparts working with managers from western countries, which can be explained by distributive justice differences. Scott et al. (2003) explore job satisfaction in U.S. invested enterprise in China. The empirical evidence indicates that Chinese employees have higher job satisfaction, a lower possibility to change jobs and are more willing to cooperate with colleagues than their U.S. counterparts.

3.2.5 Educational mismatch, skill mismatch and job satisfaction

It is well recognised that a worker's productivity and skill level is determined by one's abilities, attitudes and knowledge (Badillo-Amador and Vila, 2013). When a worker enters into the labour market, there is a possibility that he may find a job that is not equivalent with the skill requirement of the job, being either lower or higher, which can be called job-worker skill mismatch (Sutherland, 2012). Job-worker skill mismatch has very important implications for both employees and employers as the quality of the job-worker match can determine productivity and wages to some extent. There are three kinds of skill mismatch, namely overskill, underskill and domain mismatch (Badillo-Amador and Vila, 2013)[35]. When the skill level the individual holds is higher than the job requires, this condition is defined as "overskill" and when the skill level is lower than the job requires, this can be described as "underskill". Battu et al. (2000) argue that the measurement and extent of mismatch are decided by the way mismatch is defined.

Most of the literature employs years of schooling or qualifications to identify job-worker mismatch because of the convenience and feasibility to collect data (Chevalier, 2003) and thus educational mismatch is deemed as a good proxy of skill mismatch. Assignment theory implies that educational mismatch and skill mismatch are closely related (Sattinger, 1993). In assignment theory, candidates are allocated from the top to the bottom of job complexity based on their skills. That is to say, the most skilled individuals are assigned to the most difficult and advanced jobs and meanwhile, the

[34] There are three kinds of justice, namely procedural justice, performance-based distributive justice and interactional justice.

[35] Because of the lack of domain information in our dataset, we only focus on the discussion of overskill and underskill here.

least skilled person is allocated to the simplest one. Workers report their educational level as indicators of their skill level (Allen and Van der Velden, 2001). However, in the heterogeneous theory, Green and McIntosh (2007) suggest that these two concepts are weakly correlated. Even if two workers have the same educational qualifications, their skills and abilities are heterogeneous. Those who are overeducated earn less than people who have the same level of qualifications but are correctly educated is because they have a low level of skill (Green and McIntosh, 2007). Sánchez-Sánchez and McGuinness (2013) argue that when the job entry requirement is not equal to the actual skills needed in the job, educational attainment is a poor signal of human capital and therefore overeducation is not appropriate to represent skill mismatch status. In the literature, several researchers have confirmed that educational mismatch does not imply skill mismatch (Halaby, 1994); (Di Pietro and Urwin, 2006); (Allen and De Weert, 2007).

Compared with other aspects of overeducation, the issue of job satisfaction still remains largely unexplored due to the absence of data of job satisfaction (Fleming and Kler, 2008). To date, the overeducation-job satisfaction relationship attracts the interest of economists mainly from three points of view: (1) the impact of job satisfaction on productivity (Tsang and Levin, 1985); (Tsang, 1987); (Büchel, 2002); (Verhaest and Omey, 2006), (2) expectations (Glenn and Weaver, 1982); (Tsang et al., 1991), and (3) relative deprivation (Johnson and Johnson, 2000). Tsang and Levin (1985) construct a two-stage production model for a firm to demonstrate how overeducation can have adverse effects on individual productivity. Tsang (1987) adopts quantitative analysis to explore the impact of overeducation on job satisfaction in 22 U.S. Bell companies in the telephone and telegraph industry from 1981 to 1982, which is based on Tsang and Levin (1985) model. In this study, job satisfaction is considered as an indicator of employee work effort. The application of the Cobb-Douglas production function and job satisfaction index function indicates that overeducated employees show lower job satisfaction.

Based on the literature, education is a very important variable to form people's expectations from the workplace, because it can increase individuals' job expectations and aspirations (Glenn and Weaver, 1982). After a number of years of study, an individual expects to acquire a satisfying job, high earnings and significant social status.

Moreover, more educated people may set higher requirements for their jobs than their less educated counterparts (Tsang and Levin, 1985). However, if this expectation is not fulfilled, individuals will report low job satisfaction in their jobs. When individuals acquire a job below their educational level, they may confront reduced salary, less challenging tasks and restricted autonomy (Peiró et al., 2010). That is to say, their expectations about their jobs are unfulfilled if they are overeducated, which may lead to lower job satisfaction. A bulk of literature has focus on this point of view to explain the negative relationship between job satisfaction and overeducation (Hersch, 1991); (Battu et al., 2000); (Peiró et al., 2010); (Zakariya and Battu, 2013).

Overeducation may give rise to relative deprivation, which could have negative effects on job satisfaction (Johnson and Johnson, 2000). Johnson and Johnson (2000) is the first study to use relative deprivation theory to explain the relationship between overeducation and job satisfaction. There are two sources of relative deprivation that overeducated workers may have. When well-educated individuals acquire a job that is lower than their educational level, they may incur skill mismatch, decreased salary (Alba-Ramirez, 1993); (Verdugo and Verdugo, 1989) and thus relative deprivation may happen. In addition, overeducated individuals may feel deprivation in comparison with those counterparts who are in correctly educated status. Overeducated people have two comparison groups to choose. One is those individuals who have the same educational level as them but in jobs for which are correctly educated. While the other group of people are those who work in the same job with overeducated people but are correctly educated, namely their peers (Peiró et al., 2010).

In the empirical analysis, if controlling for actual years of education, the negative relationship between overall job satisfaction and overeducation is confirmed by many studies (Tsang, 1987); (Battu et al., 2000); (Allen and van der Velden, 2001); (Verhaest and Omey, 2006). However, Green and Zhu (2010) suggest that overeducation itself without considering skill utilization cannot reduce overall job satisfaction. In terms of undereducation, the results are vague. Allen and Van der Velden (2001) find an insignificantly positive relationship between undereducation and overall job satisfaction. Verhofstadt and Omey (2003) find a negative impact of undereducation on job satisfaction for women and a positive effect for men. If taking required education level into consideration, Hersch (1991) and Verhaest and Omey (2006) all suggest that overeducated employees are less satisfied than those who are correctly educated but work at the same job level. However, Büchel (2002) reports that the effect of overeducation on job satisfaction is positive but insignificant. In terms of undereducation, Verhaest and Omey (2006) find significantly negative effects using Job Analysis (JA) method to define educational mismatch. This negative effect is also found in Hersch (1991), but it is only valid for women.

In order to better explore the relationship between overeducation and job satisfaction, some papers exploring the relationship between educational mismatch and job satisfaction in longitudinal analysis[36]. Vieira (2005) uses six waves of the European Community Household Panel (ECHP) for Portugal to explore the effects of overeducation on job satisfaction. After controlling for unobserved heterogeneity, results indicate that overall job satisfaction indeed has a negative relationship with overeducation. Moreover, connections between job satisfaction with pay, job satisfaction with the type of work and overeducation are also negative. Similarly, Johnson and Johnson (2000) suggest that overeducation can adversely affect job satisfaction in a longitudinal analysis.

While many existing papers have already presented a convincing link between overeducation and job satisfaction, the relationship between these two becomes complex when skill mismatch is taken into consideration. Badillo-Amador and Vila (2013) find that skill mismatch and educational mismatch have different influences on different aspects of job satisfaction. Overeducation has negative effects on overall job satisfaction and job satisfaction with the type of job; while skill mismatch can detriment overall job satisfaction, job satisfaction with pay and job satisfaction with the type of job. Skill mismatch plays a more important role to explain the differences of job satisfaction between individuals than educational mismatch. In addition, Allen and De Weert (2007) suggest that both educational mismatch and skill mismatch can influence job satisfaction by an equal weight. Allen and Van der Velden (2001), Green and Zhu (2010) and Mavromaras et al. (2013) and all suggest that the relationship between skill mismatch and job satisfaction is significantly negative while the result of overeducation is insignificant.

[36] Kalleberg (1977) argues that the determinant of job satisfaction may change over time and thus longitudinal data is an ideal choice to explore the determinant of job satisfaction.

Another important issue has been concerned with is whether overeducated people are dissatisfied with every aspect of job. Zakariya and Battu (2013) suggest that overeducation reduces employees' job satisfaction across four dimensions of job (high self-satisfaction, valuable experience, type of work and learning opportunities) using the 2007 Graduate Tracer Study (GTS-07) in Malaysia. Johnson and Johnson (2000) indicate that overeducated people are dissatisfied with pay and promotion. However, in terms of the work and the relationship with supervisor, there is no evidence implying that overeducated people report low job satisfaction.

3.3 Data

This chapter employs the Chinese General Social Survey (CGSS) 2008 to undertake the empirical analysis. The CGSS is the first continuous national social survey project in China, starting from 2003, which is conducted jointly by Renmin University and Hong Kong University of Science and Technology. It adopts the style of face to face interviews and the respondents in households and communities are randomly selected. To maintain the representativeness of registered households, the CGSS uses the fifth population census in sampling (Cheng et al., 2014b).

The data of CGSS 2008 covers 29 provinces and municipalities with 6000 observations altogether in mainland China. In this survey, the response rate, the missing value rate and logic error rate are 54.32%, 3.11% and 5.18% respectively. Based on above figures, the CGSS 2008 is a very high-quality and valuable dataset in China now (Cheng et al., 2014b).

The CGSS 2008 provides a range of questions about job satisfaction, which are of interest in this chapter. Firstly, respondents are asked to rate satisfaction levels with their salary, welfare, workload, working conditions and facilities, the relationship with their colleagues, the relationship with their boss, commuting distances to job location and housing benefits, which are eight specific aspects of the job. The last question is to ask individuals to rate their overall job satisfaction when all things are considered. Satisfaction is an ordinal variable measuring the respondent's perception of job satisfaction in six scales: 1=very satisfied, 2=quite satisfied, 3=indifferent, 4=quite dissatisfied, 5=very dissatisfied, 6=hard to say[37]. Additionally, the CGSS 2008 includes a wide-ranging set of socioeconomic factors. Observations used in this chapter are restricted to individuals aged between 18 and 60. This is because the mandatory retirement age in China is 60. Those who are students and have zero or unknown income are omitted from the analysis. After deleting missing values of all the dimensions of job satisfaction and control variables and dropping observations answering "hard to say" about job satisfaction, 2260 valid observations remain. Table 3-1 presents the summary statistics of all the dependent and independent variables in this chapter. Control variables are spilt into three categories: personal characteristics, employment characteristics and regions.

[37] In empirical analysis in this chapter, job satisfaction scales have been recoded to 1=very dissatisfied, 2=quite dissatisfied, 3=indifferent, 4=quite satisfied, 5=very satisfied and 6=hard to say.

Table 3-1 Summary statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Dependent variables Job satisfaction with					
Salary	2260	3.231	0.944	1	5
Welfare	2260	3.118	0.997	1	5
Workload	2260	3.177	0.918	1	5
Working conditions and facilities	2260	3.313	0.853	1	5
The relationship with colleagues	2260	3.908	0.696	1	5
The relationship with boss	2260	3.619	0.768	1	5
Commuting distance to job location	2260	3.568	0.906	1	5
Housing benefits	2260	2.790	1.048	1	5
Overall job satisfaction	2260	3.386	0.766	1	5
Personal characteristics					
Educational levels	2260	2.771	1.120	1	6
Required educational level	2260	2.985	0.958	2	5
Years of schooling	2260	10.767	3.219	6	24
Overeducated	2260	0.231	0.422	0	1
Undereducated	2260	0.394	0.489	0	1
Skill mismatch	2260	0.097	0.296	0	1
Age	2260	39.227	10.988	18	60
$Age^2/100$	2260	16.594	8.865	3.24	36
Male	2260	0.557	0.497	0	1
Ethnicity----Han	2260	0.927	0.259	0	1
Political affiliation---Communist party member	2260	0.158	0.365	0	1
In a healthy health status	2260	0.934	0.248	0	1
Married	2260	0.806	0.395	0	1
Urban	2260	0.734	0.442	0	1
Lower class	2260	0.462	0.499	0	1
Middle class	2260	0.508	0.500	0	1
Upper class	2260	0.030	0.171	0	1
Employment characteristics					
Hourly wage (Yuan)	2260	9.570	16.569	0.052	520.833
Work unit type: reference group (non-public)					
Public	2260	0.521	0.500	0	1
Job type: reference group (Part-time)					
Full-time	2260	0.860	0.347	0	1
Firm size: reference group (small)					
Small	2260	0.297	0.457	0	1
Medium	2260	0.346	0.476	0	1
Large	2260	0.357	0.479	0	1
Regions: reference group (West)					
East	2260	0.460	0.498	0	1
Central	2260	0.280	0.449	0	1
West	2260	0.260	0.439	0	1
Total	2260				

3.3.1 Personal characteristics

In CGSS 2008, participants are asked to report both their highest educational qualifications and years of schooling. Based on the Chinese education system, educational levels are combined into six levels: 1. Primary school or less, 2. Junior high school, 3. Senior high school, 4. College level, 5. University, 6. Master's or higher[38]. In addition, age is measured in years. According to Clark et al. (1996), it is possible to have a U-shaped relationship between age and job satisfaction, therefore, age squared is

[38] See Table B1.

also included in the analysis. The mean age of respondents in the sample is 39 years old. Male is used as a dummy variable to represent gender, in which female is the base group. From Table 3-1, we can see that 55.7% are male and 44.3% are female. The ethnicity variable is a dummy variable where ethnicity is equal to 1 if individual's ethnicity is Han[39]. The Political variable is also a dummy variable where the respondent's political affiliation is communists party member, Political is equal to 1[40]. In addition, individuals are asked "what do you think about your health status?" Answers are measured on a 5-point scale ranging from 1 (very unhealthy) to 5 (very healthy). In this chapter, health variable (in a healthy health status) is measured as a dummy variable where if respondents report their health status as very healthy, quite healthy and average, health variable is equal to 1. Marital status is spilt into two categories: married and single individuals (i.e. not yet married, cohabit, divorced and widowed). As can be seen from Table 3-1, 80.6% are married. In addition, Urban is a dummy variable indicating people's household registration status and 73.4% of respondents own urban registration (Urban=1). Social status is measured through the question: which social status do you think you are?" Responses are coded into three levels: 1. Lower; 2. Middle and 3. Upper. Individuals who consider themselves as upper class are the base group. In addition, we can see from Table 3-1 that 23.1% of workers in the Chinese labour market are estimated to be overeducated and 39.4% of the labour force is treated as undereducated. The remaining 37.5% of workers have the correct education required for their jobs. According to the literature of overeducation in China, the incidence of overeducation is between 20% and 30%[41].

3.3.2 Employment characteristics

Four employment variables available in the survey are included in the analysis since they are related to the analysis of job satisfaction. The hourly income is used to indicate pay in the analysis. In terms of firm size, there are three categories in this chapter: Small (if participant's firm employees are no more than 25 workers), Medium (if participant's

[39] There are 56 nationalities in China and Han is the largest group accounting for 91.96% of China's population according to 1990 census (Gladney, 1994).

[40] Categories of political affiliation in the survey are as follows: 1. Communist party member; 2. Democratic parties; 3. League member; 4. General public.

[41] Ren and Miller (2012) find that the incidence of overeducation in the rural area is 27.3% and 27% of workers are undereducated. In addition, Mayston and Yang (2008) report that about 20.5% of graduates have surplus education.

firm employees are between 26 and 250 employees) and Large (if respondent's firm employs are more than 250 workers). The 'small group' is the benchmark group. Work unit type is measured as a dichotomous variable whereby "Public" is 1 and "Non-public" is 0[42]. In addition, the CGSS 2008 has two classifications for job type: 1. Full-time, 2. Part-time. One dummy variable is included to indicate if an individual has a full time job or not.

Considering the obvious regional disparity in China that may affect job satisfaction, 29 provinces and municipalities in the data have been classified into East, Central and West regions according to the distinct level of economic development in this chapter. West region is the base group.

3.3.3 The measurement of educational mismatch and skill mismatch

One important issue in this chapter is the measurement of educational mismatch and skill mismatch. Due to data constraints, the mode method proposed by Kiker et al. (1997) is the only available method to choose to measure educational mismatch[43]. The mode method defines that workers are considered to be adequately educated if their actual education level is equal to the mode level of education within their occupations. Overeducated (undereducated) workers can be defined if their actual education attainment is higher (less) than the mode level of education in their occupations[44]. According to the Chinese Dictionary of Occupation Classification, occupations are classified into eight categories, which are shown in Table 3-2.

Unlike educational mismatch, skill mismatch can be measured in a more direct way by asking workers whether they have the required skills to perform job tasks. Based on the literature, there are three measures of skill mismatch, namely skill deficit, skill surplus and required skill (Desjardins and Rubenson, 2011). In this chapter, the skill mismatch variable is constructed from the question in the survey, "did you meet the standard of employer regarding skills and experiences when you acquired this job?" Answers to this

[42] Work unit type in this chapter is classified into two categories: public enterprises (state-owned enterprises and collective-owned enterprises) and non-public (private owned enterprises, foreign owned enterprises, joint-venture and other enterprises), which refers to Démurger et al. (2012).
[43] Job analysis (JA) and worker's self-assessment (WA) are another two methods to measure educational mismatch. Details can be found in Rumberger (1987) and Sicherman (1991).
[44] Details about the highest educational level are in Table B1 in the appendix.

question are as follows: 1. Matched; 2. Over; 3. Under. However, due to few observations in "under" group[45], it is not possible to construct indicators of overskilling and skill deficit as Allen and Van der Velden (2001) and Green and McIntosh (2007). Instead, a 0/1 dummy variable (mismatch=1) is created to indicate skill mismatch (Over and Under), which provides a direct measure of skill mismatch. The cross-tabulated distribution of educational mismatch and skill mismatch are shown in Table 3-3.

Table 3-2 Occupation classifications

Occupation	Required educational level	Freq.	Percent
Principals in governments, Parties, enterprises and institutions	3	181	8.01
Professional and technicians	5	340	15.04
Clerk and administration personnel	3	256	11.33
Commercial personnel	3	78	3.45
Service personnel	3	400	17.70
Production, transport equipment operators and related personnel	2	355	15.71
Police and soldier	3	292	12.92
Other practitioner (difficult to classify)	2	358	15.84
Total		2260	100.00

Table 3-3 The relationship between educational mismatch and a measure of skill mismatch

Educational mismatch	Skill matched	Skill mismatched	Total
Undereducated	819 (92.02%)	71 (7.98%)	890 (39.38%)
Adequately educated	768 (90.57%)	80 (9.43%)	848 (37.52%)
Overeducated	454 (86.97%)	68 (13.03%)	522 (23.10%)
Total	2041 (90.31%)	219 (9.69%)	2260 (100%)

As can be seen from Table 3-3, about 9.69% of employees have the problem of skill mismatch. It seems that skill mismatch is not a very significant problem compared to

[45] There are only 73 observations in the answer "under" in the sample.

educational mismatch in this chapter. When taking educational mismatch into consideration, about 86.97% of respondents who have surplus education have matched skills and experiences. This percentage is quite high compared with results from Di Pietro and Urwin (2006) which focuses on the Italian labour market[46]. Two reasons may explain this. When specifically explore this group of workers (i.e. overeducated workers with matched skills), we find that about 52.86% of those workers are clerk and administration personnel (17.18%), service personnel (12.33%) and production and transportation personnel (23.35%). It seems that skill is more related to perform the job than qualification for these types of job. The second reason may be the "heterogeneous skill within qualification levels" (Green and McIntosh, 2007). That is to say, those overeducated people who have matched skills are at the bottom of skill distribution of people who have similar educational level with overeducated people. If considering skills and abilities, those overeducated individuals are suitable for lower level jobs that have a lower educational requirement, but their skills are matched in this case. A possible explanation for this in China is the higher education expansion which occurred after 1999. The expansion of the enrollment rate, has meant that the distribution of ability of the student body has been expanded, leading to larger tails of the distribution. Low ability is potentially one of reasons causing people to be overeducated (Hartog, 2000).

In addition, we find that 9.43% of employees who have accurate educational level for the job still report that their skills and experiences are not matched with the employment requirement. Furthermore, after using a correlation test, the correlation coefficient between educational mismatch and skill mismatch is 0.0067 (p=0.7497), which confirms that even two workers have the same educational qualifications, their skills and abilities are heterogeneous[47]. Based on above results, adequate evidence for the heterogeneous skill theory is found and the assignment theory seems not appropriate in Chinese labour market.

3.3.4 Satisfaction with various aspects of the job

Table 3-4 presents patterns of eight aspects of job satisfaction and overall job

[46] Di Pietro and Urwin (2006) find that about 22.14% of graduates who are estimated as overeducated reporting that they use "quite a lot" or "a lot" of knowledge and skills in the current jobs.
[47] A dummy variable is generated to indicate educational mismatch.

satisfaction in the full sample. As can be seen, the most frequent response for satisfaction with salary; the relationship with colleagues; the relationship with boss and commuting distances to job location, is all “quite satisfied”. In terms of satisfaction with welfare, workload, working conditions and facilities and housing benefits, the mode responses are all “indifferent”. Chinese workers seem more satisfied with the relationship with colleagues and boss than other aspects of job. Conversely, nearly 40% of respondents report that they are “very dissatisfied” or “quite dissatisfied” with housing benefits, which is the highest figure reporting dissatisfaction among all the aspects of job and overall job satisfaction, which may be related to the ever increasing housing prices in China. Although the percentage of reporting “quite satisfied” or “very satisfied” are more than 40%, more than one fifth of respondents still “very dissatisfied” or “quite dissatisfied” with their salary, welfare and workload. In terms of overall job satisfaction, nearly half of our sample is “quite satisfied” or “very satisfied” with their job. In all, Chinese workers seem quite satisfied with their jobs except for the satisfaction with housing benefits.

Table 3-4 Satisfaction with various aspects of the job

Satisfaction with	Very dissatisfied	Quite dissatisfied	Indifferent	Quite satisfied	Very satisfied	Total
	1	2	3	4	5	
Salary	4.69% (106)	16.86% (381)	33.81% (764)	39.96% (903)	4.69% (106)	100% (2260)
Welfare	7.08% (160)	18.01% (407)	36.19% (818)	33.45% (756)	5.27% (119)	100% (2260)
Workload	4.38% (99)	17.08% (386)	39.69% (897)	34.20% (773)	4.65% (105)	100% (2260)
Working conditions and facilities	2.83% (64)	12.08% (273)	41.06% (928)	39.03% (882)	5.00% (113)	100% (2260)
The relationship with colleagues	0.49% (11)	2.08% (47)	20.13% (455)	60.80% (1374)	16.50% (373)	100% (2260)
The relationship with boss	0.97% (22)	4.47% (101)	36.50% (825)	47.79% (1080)	10.27% (232)	100% (2260)
Commuting distances to job location	2.35% (53)	9.96% (225)	28.01% (633)	47.96% (1084)	11.73% (265)	100% (2260)
Housing benefits	12.96% (293)	25.66% (580)	33.81% (764)	24.51% (554)	3.05% (69)	100% (2260)
Overall job satisfaction	1.59% (36)	9.16% (207)	41.77% (944)	43.98% (994)	3.50% (79)	100% (2260)

3.3.5 Satisfaction in groups

Table 3-5 describes the mean satisfaction level in three different groups: overeducated people, undereducated people and correctly educated people. One point needs to be mentioned here. Contrary to the literature, the mean satisfaction level of all job satisfaction dimensions and overall job satisfaction of overeducated workers are higher than those correctly educated individuals. That is to say, overeducated workers do not appear to treat their "overeducation" as a negative influence on their satisfaction level. In addition, based on the one way ANOVA in this chapter, the three groups show no difference for the mean satisfaction level only in job satisfaction with salary and job satisfaction with commuting distances to job locations. According to the existing literature, overeducated people should report lower satisfaction level than correctly educated workers. Zakariya and Battu (2013) note that well-matched workers have higher mean job satisfaction levels than overeducated workers in Malaysia. However, based on Table 3-5, at least in the Chinese labour market, this is contrary to our expectations.

Table 3-5 Mean satisfaction level among over/under/correctly educated groups

Mean satisfaction with	Overeducated	Undereducated	Correctly educated	One way ANOVA
Salary	3.259	3.197	3.250	0.99
Welfare	3.261	2.985	3.170	14.51***
Workload	3.291	3.093	3.193	7.92***
Working conditions and facilities	3.441	3.234	3.317	9.78***
The relationship with colleagues	3.969	3.894	3.883	2.73*
The relationship with boss	3.684	3.601	3.598	2.43*
Commuting distances to job location	3.632	3.527	3.571	2.23
Housing benefits	2.956	2.737	2.744	8.54***
Overall job satisfaction	3.460	3.338	3.392	4.19**

3.4 Methodology

3.4.1 Estimation methodology

In CGSS 2008, job satisfaction variables are measured on a scale from 1 (very dissatisfied) to 5 (very satisfied). Therefore, an Ordered Probit Model technique will be employed here. Because of the small number of observations in some answer categories, it is necessary to combine them from 5 categories to 3 categories, namely 1. Dissatisfied; 2. Indifferent and 3. Satisfied. The answer categories "very dissatisfied" and "quite dissatisfied" are combined as "dissatisfied". The answer categories "Quite satisfied" and "Very satisfied" are combined as "Satisfied".

For each observation, the ordered probit model can be obtained by a latent variable approach[48], which is specified as:

$$Y_i^* = \beta X_i + \mu_i \tag{3}$$

$$Y_i = \text{m if } \alpha_{m-1} < Y_i^* < \alpha_m \tag{4}$$

$$\begin{aligned} \text{Pr } (Y_i = m|X_i) &= \text{Pr}(\ \alpha_{m-1} < Y_i^* < \alpha_m) \\ &= Pr(\ \alpha_{m-1} < \beta X_i + \mu_i \ < \alpha_m) \\ &= Pr(\alpha_{m-1} - \ \beta X_i < \mu_i < \alpha_m - \ \beta X_i) \\ &= F(\alpha_m - \beta X_i) - F(\alpha_{m-1} - \beta X_i) \end{aligned} \tag{5}$$

Y_i is an ordered response representing values $\{0,1,2, \dots \dots . M\}$. α_{m-1}, α_m are a set of unknown threshold coefficients or cutpoints to be estimated. Y_i^* is a latent and unobserved variable which can be treated as utility value. β is a vector of estimated parameters and μ_i is an error term which is normally distributed with mean zero and variance one[49]. In equation (5), the probability that observation i will be treated as m is determined by the probability that Y_i^* can be observed between α_{m-1} and α_m. $F(*)$ is the cumulative distribution function.

In this chapter, we observe the following:

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48 A latent variable is assumed to represent the ordered response.

49 β represents for the similar effect of X_i on Y_i and X_i on Y_i^*.

Y_i= 1 (dissatisfied) if $Y_i^* \leq \alpha_1$ (6)

Y_i = 2 (indifferent) if $\alpha_1 < Y_i^* \leq \alpha_2$ (7)

Y_i = 3 (satisfied) if $Y_i^* > \alpha_2$ (8)

Y_i refers to the overall job satisfaction and other eight aspects of job satisfaction. α_1, α_2 are unknown threshold coefficients or cutpoints to be estimated. X_i is a sector of control variable that may affect job satisfaction. Cutpoints can be obtained through the Maximum Likelihood Estimation (MLE) for ordered probit model.

3.4.2 Alternative models

First, we use the following specification to explore the determinants of overall job satisfaction of all workers in China.

Y_i=α_0+$\beta_0 X_i$ +μ_i (9)

where Y_i is the overall job satisfaction. X_i is a vector of control variables that may affect job satisfaction, which contains personal characteristics (age, age^2, years of schooling, gender, ethnicity, political affiliation, marriage, household registration, health status and social status), employment characteristics (hourly income, firm size, job type and work unit type) and regions (east, central and west). μ_i is error term with a normal distribution.

In empirical analysis, we have two specifications. Specification 1 is the model controlling for hourly wage and specification 2 is the model without controlling for the wage effects.

The central topic of this chapter is to explore the relationship between overeducation and overall job satisfaction and dimensions of job satisfaction. Models often used in the overeducation literature include detailed educational level and two dummy variables indicating overeducation and undereducation (Verdugo and Verdugo, 1989). In this chapter, we also adopt two dummy variables to indicate overeducation and undereducation. However, we make two explicit comparisons among individuals. The first one is that, by controlling for actual educational attainment, overeducated people are compared with individuals who have the same educational level but are correctly educated. The second one is to make a comparison between overeducated individuals and persons who are correctly educated in similar jobs (i.e. with the same required educational level) with overeducated people. The two models are described as follows:

$$Y_i = \alpha_1 + \beta_1 X_i + \lambda_1 Yedu_i + \rho_1 over_i + \gamma_1 under_i + \varepsilon_i \quad (10)$$

$$Y_i = \alpha_2 + \beta_2 X_i + \lambda_2 Yredu_i + \rho_2 over_i + \gamma_2 under_i + \varepsilon_i \quad (11)$$

Where the dependent variable (Y_i) is overall job satisfaction and alternatively the other eight facets of job satisfaction, $Yedu_i$ = actual years of schooling, $Yredu_i$= the required level of education, $over_i$ is the dummy variable of overeducation, $under_i$ is the dummy variable of undereducation, and X_i is a vector of control variables including personal characteristics (age, age^2, gender, ethnicity, political affiliation, marriage, household registration, health status and social status), employment characteristics (hourly income, firm size, job type and work unit type) and regions (east, central and west). ε_i is an error term with a normal distribution. In equation (10), mismatched people are compared with well-matched workers who have the same years of schooling. In equation (11), mismatched groups are compared to correctly educated people who do jobs with the same required level of education.

Allen and Van der Velden (2001) note that skill mismatch is more suitable to explore job satisfaction than educational mismatch. In order to verify any effects of educational mismatch and skill mismatch on job satisfaction and facets of job satisfaction, skill mismatch is also added into equations (9), (10) and (11), which are specified as follows:

$$Y_i = \alpha_0 + \beta_0 X_i + \mu_0 mismatch_i + \mu_i \quad (12)$$

$$Y_i = \alpha_1 + \beta_1 X_i + \lambda_1 Yedu_i + \rho_1 over_i + \gamma_1 under_i + \mu_1 mismatch_i + \varepsilon_i \quad (13)$$

$$Y_i = \alpha_2 + \beta_2 X_i + \lambda_2 Yredu_i + \rho_2 over_i + \gamma_2 under_i + \mu_2 mismatch_i + \varepsilon_i \quad (14)$$

Where $mismatch_i$ is a dummy variable to indicate skill mismatch and the same independent variables have been used as equation (9), (10) and (11). μ_i and ε_i are error terms with a normal distribution. These three models will provide evidence to show which kind of mismatch is a better indicator of subjective well-being at work. Four specifications are used in this chapter to demonstrate the empirical analysis. Specification 1 is the model without controlling for the skill mismatch variable. Specification 2 is the model without controlling for both skill mismatch and the wage effects. Specification 3 includes all the variables. Specification 4 is the model without controlling for the wage effects.

3.5 Empirical results

3.5.1 Determinants of overall job satisfaction

In this section, the determinants of overall job satisfaction will be discussed. Table 3-6 presents results of marginal effects of reporting each answer category of overall job satisfaction. In Table 3-6, specification 1 is the model controlling for hourly wage and specification 2 is the model without controlling for the wage effects.

Age

We observe from Table 3-6 that the negative and positive marginal effects of age and age-squared indicate that overall job satisfaction drops with age first and rise thereafter. That is to say, there is a U-shaped relationship between age and overall job satisfaction. Young workers are new to the labour market and they don't have a definite judgment about their work, so they may report high job satisfaction. As they gain more work experience in the labour market, they know how to set standard to judge their jobs and working conditions. In addition, boredom from job and some unfulfilled career expectations may rise with age. Therefore, job satisfaction decreases around middle age. There are two explanations to explain higher job satisfaction among older cohorts. One is the "aging effect", which states that higher job satisfaction reported by older people occurs because they have better jobs than young people (Mottaz, 1987). This explanation is similar to the self-selection effect, which is proposed by Gazioglu and Tansel (2006). Older people are experienced workers and they know how to find a suitable, good job for themselves and thus may obtain a higher level of job satisfaction. The second explanation is from expectation theory (Clark, 1997). Older people have lower expectations about their jobs. They face limited choices in the labour market because of their age, which may result in higher job satisfaction among old age cohorts. The U-shaped relationship between age and job satisfaction of Chinese workers in this chapter is consistent with existing literature of Clark et al. (1996), Clark and Oswald (1996) and Brown and McIntosh (1998). However, Nielsen and Smyth (2008) suggest that age has a positive effect on job satisfaction among urban workers in China[50].

Gender

According to Table 3-6, males are less likely to report "satisfied" than females, but this result is insignificant. This result is inconsistent with the existing literature in the USA and UK (Bender et al., 2005). In China, the fact that the labour force participation rate of women has increased making the labour force participation rate of women higher than many other countries (Bauer et al., 1992)[51], women's earnings have become an important part of family income. The increased labour force participation rate may change the structure of women's expectations in judging job satisfaction. According to Crosby (1982), women always compare their circumstances with those women who stay at home or who hold low-paid jobs in western countries and thus they report higher job satisfaction than men. However, according to the insignificant result in this chapter, women may compare themselves with men to judge job satisfaction in China.

Education

The results in Table 3-6 indicate that there is a positive relationship between years of schooling and overall job satisfaction. The positive coefficient on education in specification 2, column 6 in Table 3-6 indicates that individuals who have higher educational levels are more likely to find a job with high contentment than those with lower levels of education. In specification 1, column 3 in Table 3-6, we can see that even after controlling for hourly wage, education still has a positive impact on overall job satisfaction. That is to say, individuals who are better educated are more competitive and so are more likely to find a job with better intrinsic and extrinsic rewards than those with lower levels of education at a given income level (Glenn and Weaver, 1982). Cheng et al. (2014b) also find a positive effect of education on job satisfaction in China using CGSS 2008.

[50] Only age variable is included in the regression in the study of Nielsen and Smyth (2008).
[51] Bauer et al. (1992) point out that the female participation rate in urban China is almost 90% in the 1987 One Percent Population Survey.

Wages

If the hourly wage increases by 1%, the probability of being "satisfied" with the overall job increases by 0.2 percentage points, which can be seen from specification 1 column 3 in Table 3-6. The marginal effects on pay of reporting "satisfied" shown in Table 3-6 is significantly positive, which indicates that higher pay will result in higher job satisfaction. However, this marginal effect is small compared with other variables, for example marriage or social status variables. This small marginal effect is consistent with Cheng et al. (2014b)[52].

Marriage

According to Table 3-6, people who are married are more likely to report "satisfied" than single individuals. A possible reason for this finding is that married families have two incomes potentially, so they may not have an economic burden as large as single individuals. Therefore, they can choose to stay in jobs that provide high job satisfaction or to find a job with high job satisfaction. However, single individuals may have to stay in or take jobs that provide low job satisfaction due to income constraints (Nielsen and Smyth, 2008).

Establishment size

Column 3 in Table 3-6, specification 1 indicates that employees in medium and large sized firms report a lower level of overall job satisfaction than those in small sized firms. Idson (1990) and Clark et al. (2009) all find similar results. Different working environment flexibility leads to different levels of job satisfaction (Idson, 1990). For example, in large firms, the workplace rigidity is strong and work structure is regimented, which may reduce employees' freedom to design the way to carry out their work and their working hours. However, in small firms, working schedules and working styles are potentially more flexible than medium and large firms and thus may lead to higher job satisfaction.

Social status

Individuals in the low social status decrease the possibility to report "satisfied" of job

[52] Cheng et al. (2004b) find that the marginal effect of hourly income on reporting job satisfaction is only 0.003.

by 25.1 percentage points than those in the upper class, which is shown in specification 1 column 3. People judge subjective well-being based on the comparison groups or expectations. If you are in a low social status, which means you may face limited networks, mobility and opportunities, you may be less likely to find a satisfied and high level of job. In the Chinese culture, networks are a good reflection of self-worth (Zhao, 2001). Thus, downward mobility and unsatisfied self-worth will create a feeling of deprivation. Hu (2013) and Liu and Li (2011) all find similar results.

Skill mismatch

Table 3-6 specification 2 column 6 shows that employees who are skill-mismatched are 9.6 percentage points less likely to report "satisfied" of the overall job. Even after controlling for the hourly wage, this effect remains. Skill mismatch indeed can be detrimental to overall job satisfaction[53] and thus it is not a desirable result for both employees and employers. According to Allen and Van der Velden (2001), skill underutilization and skill deficit all have negative effects on job satisfaction, which is similar to the findings in this chapter. Badillo-Amador and Vila (2013) suggest that all kinds of skill mismatch can strongly reduce employees' overall job satisfaction[54].

Results from specifications 1 and 2 shown in columns 3 and 6 of Table 3-6, respectively, indicate that full-time workers are more likely to report higher job satisfaction than part-time workers, which is similar to the result from Shockey and Mueller (1994). In addition, workers in the public sector report higher job satisfaction than those in the non-public sector after controlling for hourly wages, which is shown in column 3 specification 1 in Table 3-6. Higher job satisfaction in the public sector may be explained by the relatively stable employment, higher social status and attractive compensation provided in the public sector. *Han* Chinese are less likely to report "satisfied" than minority Chinese, which is contrary to our expectations. Minority groups are mainly located in the western region and along the west border of China where economic development lags behind the east and central region. We speculate that *Han* Chinese may have higher expectations of their jobs than minority Chinese and that

[53] Due to the data limitations, we can not classify skill mismatch specifically as overskilled and skill deficit in this chapter.

[54] Skill mismatch in this study is derived from self-assessment question from survey if one has inadequate skills to perform current employment (skill deficit) and current personal capacity allows for a more demanding job (overskilled).

their aspirations are not being fulfilled. Therefore, they may report lower job satisfaction. Based on the results reported in Table 3-6, the effects of other factors on job satisfaction, such as political affiliation, household registration and healthy status are insignificant. In terms of region, the east and central region are more likely to report “satisfied” than the west region, which is a similar result to Cheng et al. (2014b). Economic development in Western China is not as advanced as that of central and eastern China. Therefore, job expectations for employees in the west region are less likely to be fulfilled and thus they report lower job satisfaction levels than their counterparts in the central and eastern regions of China.

From section 3.5.2 to section 3.5.9, specification 1 is the model without controlling for skill mismatch variable. Specification 2 is the model without controlling for both skill mismatch and the wage effects. Specification 3 includes all the variables. Specification 4 is the model without controlling for the wage effects.

3.5.2 Overall job satisfaction, educational mismatch and skill mismatch

As can be seen from specification 1, column 3 in Table 3-7, when only educational mismatch variables are included in the model, overeducated workers are more likely to report “satisfied” than correctly educated individuals working in similar jobs, but this effect is not significant. Büchel (2002) also reports that the marginal effect of reporting job satisfaction of overeducated people compared to adequately educated people who are in similar jobs is positive but insignificant. Undereducated workers are 3.5 percentage points less likely to report “satisfied” than individuals who are correctly educated working in similar jobs. However, this negative effect is also insignificant. In addition, each level of required education increases the probability of reporting “satisfied” for overall job satisfaction by 3.3 percentage points, which may indicate that a correct match between education and job is very important to increase job satisfaction. Tsang et al. (1991) also find similar result. When both educational mismatch and skill mismatch are included in the model (specification 3), we can see that people with mismatched skills are less likely to report job satisfaction by 9.2 percentage points and the effects of educational mismatch change little after controlling for skill mismatch (compare specification 1 with specification 3). We can also see from specification 3, column 3, that the impact of skill mismatch on job satisfaction is stronger than the effect of educational mismatch.

It is interesting to see that in the gross effects (specification 4) in Table 3-7, overeducated individuals are 4.4 percentage points more likely to report "satisfied" for the overall job than correctly educated workers in similar jobs. Undereducated workers are 4.2 percentage points less likely to report "satisfied" than adequately educated individuals who work in jobs with the same required educational level. However, after controlling for the hourly wage, both effects of overeducation and undereducation on overall job satisfaction become insignificant (specification 3). Wage differentials between educational mismatched groups and correctly educated groups in similar jobs may provide an explanation to the different results between specification 4 and specification 3. The above results show that skill mismatch seems to be a threat to workers' job satisfaction levels rather than educational overeducation.

3.5.3 Job satisfaction with pay, educational mismatch and skill mismatch

Because overeducated (undereducated) people earn higher (lower) wages than adequately educated worker in the same job (Hartog, 2000), we hypothesise that overeducated (undereducated) people may show higher (lower) job satisfaction with their pay than correctly educated people in similar jobs. Specification 1, reported in column 3 Table 3-8, shows the marginal effects for reporting "satisfied" with pay without taking consideration of skill mismatch. Contrary to our expectations, we find that the relationship between educational overeducation and job satisfaction with pay is negative and insignificant after taking hourly wage into consideration[55]. Such a result indicates that overeducation may have no effect on satisfaction with pay, which is consistent with Badillo-Amador and Vila (2013). In addition, required educational level and deficit education have no impact on job satisfaction with pay as shown in Table 3-8. However, when a skill mismatch dummy variable is added into the analysis, we can see that employees who have mismatched skills are 5.3 percentage points less likely to report "satisfied" in terms of job satisfaction with pay, even after controlling for hourly wages (specification 3, column 3). Although skill mismatched people have a lower wage penalty than overeducated people (McGuinness and Sloane, 2011), it is the skill match itself that is decreasing job satisfaction with respect to pay.

[55] The coefficient on undereducation in Table 3-8 Specification 1 is also insignificant in this chapter.

3.5.4 Job satisfaction with welfare, educational mismatch and skill mismatch[56]

Table 3-9 reports the marginal effects of reporting answer categories of job satisfaction with welfare. As can be seen from column 3 in Table 3-9 Specification 3, the insignificant coefficient of overeducation indicates that overeducation may not influence job satisfaction with welfare. However, individuals who have correct education level with the job requirement are 2.3 percentage points more likely to report "satisfied" with welfare. Undereducated workers are 5.5 percentage points less likely to report "satisfied" of job satisfaction with welfare. Undereducation appears to reduce job satisfaction with welfare. When skill mismatch is brought into consideration as indicated in column 3 in Table 3-9 Specification 3, skill mismatch also has negative effects on job satisfaction with welfare. However, this effect is insignificant. It seems that education-job match is more relevant in explaining job satisfaction with welfare than skill-job match.

3.5.5 Job satisfaction with workload, educational mismatch and skill mismatch

Table 3-10 reports marginal effects for reporting answer categories of job satisfaction with workload. As can be seen from column 3 in Table 3-10 specification 3, overeducated people are more likely to report satisfaction with workload and undereducated people are less likely to report "satisfied" of their workload. Mavromaras et al. (2013) argue that overeducated people are more productive and have better adaptability. When choosing a lower level of job than their own educational level, they will finish quicker and be more efficient than correctly educated colleagues. Thus, they may feel less pressured and relaxed when they are at work and thus they have a higher level of job satisfaction. Undereducated workers take tasks higher than their educational level and need more time to finish than adequately educated workers in the same job, which may make them feel stressed and increase their frustration. Skill mismatched individuals have to learn the skills needed for their job and try their best to finish tasks

[56] Since the economic reform in 1978, although there is a massive increase in workers' wages and non-wage benefits, the structure of workers' fringe benefits is relatively static (Xiao, 1991). Worker's fringe benefits is consisted of five parts in China: unemployment insurance, subsidised housing, medical care, retirement benefits and work injuries insurance (Frijters et al., 2010). According to the above definition, in this chapter, job satisfaction with welfare refers to unemployment insurance, medical care, retirement benefits and work injuries insurance (Because there is a job satisfaction with housing benefits category in this chapter). In terms of retirement benefits, employers would pay employees 70% or more of his wages as a pension in China and this ratio varies with different types of firms and contract type (Xiao, 1991). Moreover, in state-owned firms, children's schooling, transportation are provided by employers as additional welfare.

and thus are less likely to report satisfaction with their workload. However, according to the insignificant coefficient of skill mismatch in specification 3 in Table 3-10, there is no effect of skill mismatch on job satisfaction with workload.

3.5.6 Job satisfaction with working conditions and facilities, educational mismatch and skill mismatch

Table 3-11 specification 2 shows that overeducated workers are 6.8 percentage points more likely to be satisfied with working conditions and facilities and undereducated people are 4.0 percentage points less likely to report “satisfied” of their working conditions and facilities than employees who are correctly educated in similar jobs. However, after controlling for hourly wages, the effect of undereducation on job satisfaction with working conditions and facilities disappears (specification 1). As can be seen in Table 3-11 specification 3, individuals who are skill mismatched are 6.9 percentage points less likely to report “satisfied” with working conditions and facilities, which suggests that skill mismatch has a negative impact on job satisfaction with working conditions and facilities.

3.5.7 Job satisfaction with the relationship with colleagues and the boss, educational mismatch and skill mismatch

Interpersonal relationship (the relationship with colleagues and boss) is described as *Guanxi* in Chinese culture, which stems from Confucianism. *Guanxi* is a very important factor to build personal relationships and business conduct in Chinese society (Xin and Pearce, 1996). In addition, it is well recognised that Guanxi (relationship with boss, colleagues and friends) is a very important determinant when choosing a job in Chinese culture (Huang, 2008). As can be seen from Table 3-12 Specification 3, overeducated people are 4.5 percentage points more likely to be satisfied with the relationship with colleagues. However, the effect of overeducation on job satisfaction with the relationship with the boss is insignificant, which is shown in Table 3-13 Specification 3. In addition, the relationship between undereducation and job satisfaction with the relationship with colleagues and boss are both insignificant. In terms of skill mismatch, it seems that individuals who are skill mismatched are less likely to report “satisfied” with the relationship with both colleagues and the boss.

3.5.8 Job satisfaction with commuting distance to job location, educational mismatch and skill mismatch

Results for satisfaction with commuting distance to job location reported in Table 3-14 indicate that overeducated workers are more likely to report satisfaction with the commuting distance to their job location than matched workers. Undereducated workers are less likely to report satisfied of commuting distance to job location. However, those effects are all insignificant. As a rational decision, individuals may make a trade-off between job and commuting distance from home to job location. Overeducated people may choose a job with a lower educational requirement because of the short commuting distance whereas undereducated people may accept a higher level of job if offered that is coupled with a long commuting distance. Long commuting distance can incur negative effects on people's well-being (Blanchflower and Oswald, 1999). Thus, undereducated people are less likely to report "satisfied" of commuting distance. Until now, there is no literature to explore this issue. This chapter suggests that there may be no relationship between educational mismatch and satisfaction with commuting distance to job location. As can be seen in Table 3-14, the effect of skill mismatch on job satisfaction with commuting distance to job location is also insignificant.

3.5.9 Job satisfaction with housing benefits[57], educational mismatch and skill mismatch

As can be seen from Table 3-15 specification 3, overeducated workers are 5.7 percentage points more likely to report satisfaction with the housing benefits than individuals who are in similar jobs but are correctly educated. The relationship between undereducation and job satisfaction with housing benefits is insignificant. However, skill-mismatched individuals decrease their probability of reporting satisfaction with housing benefits by 6.4 percentage points. The above results indicate that educational mismatch and skill mismatch both have significant impacts on job satisfaction with housing benefits.

In addition, we also make a comparison between overeducated people and individuals with similar level of education but are adequately educated[58]. However, the relationship

[57] Housing benefits include monetarisation of housing subsidies and rent subsidies. The subsidy level is varied among provinces and cities in China (Lee, 2000).
[58] Results are all attached in the Appendix B.

between overeducation and overall job satisfaction and facets of job satisfaction are insignificant except for job satisfaction with the relationship with boss and job satisfaction with housing benefits. Undereducation only has positive effect on job satisfaction on working conditions and facilities and the relationship with the boss. In terms of skill mismatch, skill mismatch has significantly negative effects on overall job satisfaction and facets of job satisfaction except for the job satisfaction with welfare, workload and commuting distance to job location, which yields the same results in the comparison with adequately educated people who have the same required educational level.

3.6 Discussion and conclusion

Throughout the literature on overeducation in China, most studies focus on the relationship between overeducation and wages. In this chapter the issue of job satisfaction in China is examined and the two research questions outlined in chapter 1 (page 8) are addressed. The overall analysis of job satisfaction in China is very limited due to the previous absence of data on job satisfaction. However, the Chinese General Social Survey (2008) provides a range of job satisfaction measures, which enables us to explore the determinants of overall and specific aspects of job satisfaction and especially to investigate detailed links between overeducation and undereducation and job satisfaction in China. For example, not only do we focus upon overall job satisfaction, we also investigate satisfaction with: salary, welfare, workload, working conditions and facilities, the relationship with colleagues, the relationship with the boss, commuting distance to job location and housing benefits. This addresses the first research question for this chapter and is a contribution to the overeducation literature in China.

The answering of the second research question and another advantage of this chapter is the introduction of skill mismatch variable into the analysis. Recent literature indicates that educational mismatch and skill mismatch are heterogeneous. Separate exploration of these two concepts is needed in the analysis of job satisfaction. In this chapter, analysis of the impacts of educational mismatch and skill mismatch on aspects of job satisfaction and overall job satisfaction are presented.

First, investigating the determinants of overall job satisfaction indicates the following results. There is a U-shaped relationship between age and overall job satisfaction, which is consistent with previous empirical results. Males have lower job satisfaction than women, but this result is not significant. In addition, there is a strong positive relationship between years of schooling and overall job satisfaction even after controlling for hourly wages. Higher pay will result in higher job satisfaction. That is to say, wage is an important determinant of overall job satisfaction in China. Married workers and employees in small firm size are more likely to report high level of overall job satisfaction. In addition, job type, work unit, social status and regions all play an important part in determining job satisfaction.

In terms of educational mismatch, as shown in Table 3-5, overeducated people report the highest job satisfaction level among the three groups. Overeducation may not result in negative effects on job satisfaction as a priori expectations. Although overeducated people's pay is higher than correctly educated people who work in the same job, overeducated people are found to be less likely to report "satisfied" of pay satisfaction. However, this effect is insignificant and the relationship between overeducation and welfare is also insignificant. In addition, results indicate that overeducated people are more satisfied with workload, working conditions and facilities, the relationship with colleagues and housing benefits than correctly educated individuals who do jobs with the same required educational level. We can infer that pay may not be the main concern for overeducated people. Instead, there may be some compensating aspects of job offered to overeducated people to achieve maximum utility of employment (McGuinness and Sloane, 2011). That is to say, in this chapter, workload, working conditions and facilities, the relationship with colleagues and housing benefits may be compensating aspects of the job that make overeducated people choose the job lower than their educational attainment to achieve a balanced tradeoff between work and life and thus they report high levels of job satisfaction.

Another inference from this chapter is that overeducated people choose to stay in a job beneath their level of education because of their own preference for some characteristics of their job, which has been referred to in the literature as voluntary overeducation (Sicherman, 1991); (Mavromaras et al., 2013). For example, overeducated people may prefer to have a low workload and low mental pressure so they choose to stay in a job that requires education lower than their educational level. In this chapter, results show that overeducated people may prefer to stay in a job with good working conditions and facilities and good relationship with colleagues, although the job is lower than their educational level. It is well recognised that Guanxi (relationship with boss, colleagues and friends) is a very important determinant when choosing a job in Chinese culture. Sousa-Poza and Sousa-Poza (2000) note that the relationship with colleagues has a positive relationship with job satisfaction. Therefore, overeducated people may report higher job satisfaction.

In addition, when educational mismatch and skill mismatch are included simultaneously into the analysis of job satisfaction, we can see that skill mismatch has a consistently stronger negative effect on job satisfaction and all facets of job satisfaction except job satisfaction with the relationship with welfare, workload and commuting distance to job location than educational mismatch. It seems that skill mismatch may undermine job satisfaction within institutions. This result is also consistent with the recent trend of shifting from education mismatch to skill mismatch in the academic and policy concern. In addition, from the insignificant results of the comparison between overeducated people and adequately educated people who have same years of schooling regarding job satisfaction, we can infer that overeducated and undereducated people in the Chinese labour market may compare themselves with their counterparts working in jobs with the same required education.

Considering the significantly negative effects of skill mismatch on overall job satisfaction and many facets of job satisfaction, the main policy concern should focus on tackling negative effects of skill mismatch rather than overeducation. The government should ensure that the job-worker match mechanism is conducted in a way that can effectively use of employees' skills to increase productivity. A good job-worker match can bring economic benefits and improve workers' well-being.

The following policy suggestions can be considered by the government:
(1) Improve the quality of education and make it more adaptive to the labour market needs.
The government has the responsibility to establish scientific mechanisms to examine

whether the content of current curriculum provided by the education system is appropriate to meet the needs of the labour market in order to ensure that the existing education system can provide sufficient skills required by the labour market and to support economic growth.

(2) Further strengthen the development of vocational education and training.

After the economic reform in 1978 in China, significant changes have been made to the Chinese education system. However, the development of vocational education and training (VET) lags far behind the economic development (Zhong, 2005). On one hand, the government should increase the ratio of investment on vocational education to total expenditure on education. For example, the ratio of investment on vocational college to total expenditure on education was only 5%, while the ratio of universities was 23% in 2013 in China (Molnar and Koen, 2015). The average ratio of education expenditure on vocational education to total education expenditure is 12 percent in OECD countries (Molnar and Koen, 2015). On the other hand, offering a range of apprenticeships can improve the efficiency of matching between skills needed by employers and skills offered by employees, especially for young workers. Recent reports from the G20 commitments and the European Council all address the importance of promoting apprenticeships to tackle young workers' unemployment and underemployment[59]. In addition, providing diversified adult training and work-related training programmes can help employees to adapt to the ever changing job content in the labour market to maintain the link between employees and labour market synchronously.

(3) Information dissemination mechanism and career guidance.

The government needs to build official channels or agencies to provide good-quality information report about job hiring practices and qualifications needed for the labour market so that people can be well-informed in order to make rational education and career choices. For example, the *Mexican Labour Observatory* in Mexico is a free-accessed online system publishing updated and dynamic employment information on the labour market. Job seekers, especially young people, can find the required education

[59] Matching Skills and Labour Market Needs: Building Social Partnerships for Better Skills and Better Jobs. http://www3.weforum.org/docs/GAC/2014/WEF_GAC_Employment_MatchingSkillsLabourMarket_Report_2014.pdf.

level in one occupation or can be informed which skill qualification is highly demand in the labour market. In addition, institutions providing career guidance and counselling services to the public should be established. Although career service centres have been established in some Chinese universities, their function is very weak. The main reason behind it is the lack of specialists and support staff. Good examples are from Jobcentre Plus in the UK and the Career Services (CS) in New Zealand.

Table 3-6 Marginal effects of reporting each answer category of overall job satisfaction

Variables	Specification 1			Specification 2		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Age	0.007**	0.009**	-0.016**	0.007**	0.008**	-0.015**
	(0.0032)	(0.0037)	(0.0069)	(0.0032)	(0.0037)	(0.0069)
Age^2/100	-0.010***	-0.012***	0.022***	-0.009**	-0.011**	0.020**
	(0.0039)	(0.0045)	(0.0083)	(0.0039)	(0.0045)	(0.0083)
Actual years of schooling	-0.007***	-0.008***	0.015***	-0.008***	-0.009***	0.017***
	(0.0018)	(0.0021)	(0.0038)	(0.0018)	(0.0020)	(0.0037)
Hourly wage	-0.001***	-0.001***	0.002***			
	(0.0004)	(0.0004)	(0.0008)			
Male	0.013	0.015	-0.028	0.010	0.012	-0.022
	(0.0088)	(0.0102)	(0.0189)	(0.0088)	(0.0101)	(0.0189)
Ethnicity	0.028*	0.033*	-0.061*	0.029*	0.033*	-0.062*
	(0.0173)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0371)
Political	-0.011	-0.013	0.024	-0.013	-0.015	0.027
	(0.0133)	(0.0154)	(0.0287)	(0.0133)	(0.0154)	(0.0287)
Married	-0.026**	-0.030**	0.057**	-0.025**	-0.029**	0.055**
	(0.0129)	(0.0148)	(0.0276)	(0.0129)	(0.0148)	(0.0276)
Urban registration	-0.007	-0.008	0.016	-0.010	-0.011	0.021
	(0.0113)	(0.0130)	(0.0243)	(0.0113)	(0.0130)	(0.0243)
Full time job	-0.026**	-0.030**	0.056**	-0.026**	-0.030**	0.055**
	(0.0130)	(0.0150)	(0.0279)	(0.0130)	(0.0150)	(0.0279)
Public sector	-0.036***	-0.041***	0.077***	-0.033***	-0.038***	0.072***
	(0.0109)	(0.0124)	(0.0231)	(0.0108)	(0.0124)	(0.0231)
Healthy status	-0.003	-0.003	0.006	-0.004	-0.004	0.008
	(0.0172)	(0.0198)	(0.0370)	(0.0172)	(0.0199)	(0.0371)
Lower social status	0.117***	0.135***	-0.251***	0.131***	0.152***	-0.283***
	(0.0290)	(0.0328)	(0.0609)	(0.0288)	(0.0324)	(0.0602)
Middle social status	0.065**	0.074**	-0.139**	0.076***	0.088***	-0.164***
	(0.0285)	(0.0326)	(0.0608)	(0.0284)	(0.0324)	(0.0605)

Medium-size firm	0.022*	0.026*	-0.048*	0.021*	0.025*	-0.046*
	(0.0115)	(0.0132)	(0.0246)	(0.0115)	(0.0132)	(0.0246)
Large-size firm	0.021*	0.024*	-0.044*	0.018	0.021	-0.039
	(0.0122)	(0.0141)	(0.0262)	(0.0122)	(0.0141)	(0.0262)
Skill mismatch	0.045***	0.052***	-0.097***	0.045***	0.052***	-0.096***
	(0.0144)	(0.0165)	(0.0307)	(0.0144)	(0.0166)	(0.0307)
East	-0.043***	-0.049***	0.092***	-0.047***	-0.054***	0.101***
	(0.0111)	(0.0127)	(0.0235)	(0.0110)	(0.0126)	(0.0233)
Central	-0.069***	-0.080***	0.149***	-0.069***	-0.080***	0.149***
	(0.0122)	(0.0138)	(0.0252)	(0.0122)	(0.0138)	(0.0253)
Number of observations	2260	2260	2260	2260	2260	2260
LR chi2		212.16			202.91	
Prob > chi2		0.0000			0.0000	
Pseudo R^2		0.0490			0.0469	

*** p<0.10, ** p<0.05, *** p<0.010**

Notes: 1. The non-public sector is the benchmark work unit type. 2. West is the bench mark region. 3. Small is the benchmark firm size. 4. Part-time job is the comparison job type. 5. Upper class is the benchmark social class.

Table 3-7 Marginal effects of reporting each answer category of overall job satisfaction (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.043***	0.049***	-0.092***	0.042***	0.049***	-0.091***
							(0.0144)	(0.0165)	(0.0307)	(0.0144)	(0.0166)	(0.0307)
Required educational level	-0.015***	-0.018***	0.033***	-0.019***	-0.022***	0.041***	-0.016***	-0.019***	0.035***	-0.020***	-0.023***	0.042***
	(0.0056)	(0.0064)	(0.0120)	(0.0055)	(0.0063)	(0.0117)	(0.0056)	(0.0064)	(0.0119)	(0.0055)	(0.0063)	(0.0117)
Overeducated	-0.014	-0.016	0.030	-0.018	-0.021	0.040	-0.016	-0.018	0.034	-0.020*	-0.023*	0.044*
	(0.0122)	(0.0140)	(0.0262)	(0.0121)	(0.0140)	(0.0261)	(0.0122)	(0.0140)	(0.0262)	(0.0121)	(0.0140)	(0.0260)
Undereducated	0.016	0.019	-0.035	0.019*	0.022*	-0.040*	0.017	0.020	-0.037	0.020*	0.023*	-0.042*
	(0.0105)	(0.0121)	(0.0226)	(0.0105)	(0.0121)	(0.0226)	(0.0105)	(0.0121)	(0.0226)	(0.0105)	(0.0121)	(0.0225)
Age	0.007**	0.009**	-0.016**	0.007**	0.008**	-0.015**	0.008**	0.009**	-0.016**	0.007**	0.008**	-0.015**
	(0.0032)	(0.0037)	(0.0069)	(0.0032)	(0.0037)	(0.0069)	(0.0032)	(0.0037)	(0.0069)	(0.0032)	(0.0037)	(0.0069)
$Age^2/100$	-0.010**	-0.011**	0.021**	-0.009**	-0.010**	0.019**	-0.010**	-0.011**	0.021**	-0.009**	-0.011**	0.020**
	(0.0039)	(0.0045)	(0.0084)	(0.0039)	(0.0045)	(0.0084)	(0.0039)	(0.0045)	(0.0084)	(0.0039)	(0.0045)	(0.0084)
Hourly wage	-0.001***	-0.001***	0.002***				-0.001***	-0.001***	0.003***			
	(0.0004)	(0.0004)	(0.0008)				(0.0004)	(0.0004)	(0.0008)			
Male	0.011	0.013	-0.024	0.008	0.009	-0.017	0.011	0.013	-0.023	0.008	0.009	-0.016
	(0.0090)	(0.0103)	(0.0192)	(0.0089)	(0.0103)	(0.0191)	(0.0089)	(0.0103)	(0.0192)	(0.0089)	(0.0102)	(0.0191)
Ethnicity	0.031*	0.035*	-0.066*	0.031*	0.035*	-0.066*	0.027	0.031	-0.059	0.027	0.031	-0.059
	(0.0173)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0372)	(0.0173)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0372)
Political	-0.014	-0.016	0.029	-0.015	-0.018	0.033	-0.014	-0.016	0.030	-0.016	-0.018	0.034
	(0.0134)	(0.0154)	(0.0288)	(0.0134)	(0.0154)	(0.0288)	(0.0134)	(0.0154)	(0.0287)	(0.0134)	(0.0154)	(0.0288)
Married	-0.025*	-0.029*	0.054*	-0.024*	-0.028*	0.051*	-0.025*	-0.028*	0.053*	-0.024*	-0.027*	0.051*
	(0.0130)	(0.0149)	(0.0278)	(0.0130)	(0.0149)	(0.0278)	(0.0129)	(0.0149)	(0.0277)	(0.0129)	(0.0149)	(0.0277)
Urban registration	-0.011	-0.012	0.023	-0.013	-0.015	0.029	-0.011	-0.012	0.023	-0.014	-0.016	0.029
	(0.0113)	(0.0130)	(0.0242)	(0.0112)	(0.0129)	(0.0241)	(0.0112)	(0.0129)	(0.0241)	(0.0112)	(0.0129)	(0.0241)

Full time job	-0.027**	-0.032**	0.059**	-0.027**	-0.031**	0.058**	-0.028**	-0.032**	0.060**	-0.027**	-0.032**	0.059**
	(0.0130)	(0.0150)	(0.0279)	(0.0130)	(0.0150)	(0.0279)	(0.0130)	(0.0150)	(0.0279)	(0.0130)	(0.0150)	(0.0279)
Public sector	-0.037***	-0.043***	0.080***	-0.035***	-0.040***	0.074***	-0.036***	-0.042***	0.078***	-0.034***	-0.039***	0.073***
	(0.0110)	(0.0125)	(0.0232)	(0.0109)	(0.0125)	(0.0232)	(0.0109)	(0.0125)	(0.0232)	(0.0109)	(0.0125)	(0.0232)
Healthy status	-0.003	-0.003	0.006	-0.004	-0.004	0.008	-0.002	-0.002	0.004	-0.003	-0.003	0.006
	(0.0173)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0372)	(0.0172)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0372)
Low social status	0.117***	0.135***	-0.253***	0.132***	0.152***	-0.285***	0.115***	0.133***	-0.248***	0.130***	0.150***	-0.280***
	(0.0291)	(0.0329)	(0.0612)	(0.0290)	(0.0326)	(0.0605)	(0.0290)	(0.0328)	(0.0610)	(0.0289)	(0.0325)	(0.0604)
Middle social status	0.064**	0.074**	-0.138**	0.076***	0.087***	-0.163***	0.062**	0.072**	-0.134**	0.074***	0.086***	-0.160***
	(0.0286)	(0.0327)	(0.0611)	(0.0286)	(0.0326)	(0.0608)	(0.0285)	(0.0326)	(0.0609)	(0.0285)	(0.0325)	(0.0606)
Medium-size firm	0.023**	0.026**	-0.049**	0.022*	0.025*	-0.047*	0.021*	0.025*	-0.046*	0.020*	0.024*	-0.044*
	(0.0115)	(0.0132)	(0.0247)	(0.0115)	(0.0133)	(0.0247)	(0.0115)	(0.0132)	(0.0246)	(0.0115)	(0.0132)	(0.0247)
Large-size firm	0.021*	0.024*	-0.045*	0.018	0.021	-0.039	0.020	0.023	-0.042	0.017	0.019	-0.036
	(0.0123)	(0.0141)	(0.0263)	(0.0122)	(0.0141)	(0.0263)	(0.0122)	(0.0141)	(0.0263)	(0.0122)	(0.0141)	(0.0263)
East	-0.046***	-0.053***	0.099***	-0.051***	-0.058***	0.109***	-0.044***	-0.051***	0.095***	-0.049***	-0.057***	0.106***
	(0.0111)	(0.0127)	(0.0235)	(0.0111)	(0.0126)	(0.0233)	(0.0111)	(0.0127)	(0.0235)	(0.0110)	(0.0126)	(0.0233)
Central	-0.071***	-0.081***	0.152***	-0.071***	-0.082***	0.153***	-0.068***	-0.079***	0.147***	-0.069***	-0.079***	0.148***
	(0.0122)	(0.0138)	(0.0253)	(0.0122)	(0.0138)	(0.0253)	(0.0122)	(0.0138)	(0.0253)	(0.0122)	(0.0138)	(0.0254)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		198.52			188.57			207.42			197.20	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0458			0.0435			0.0479			0.0455	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-8 Marginal effects of reporting each answer category of job satisfaction with pay (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification3			Specification 4		
	Dissatisfied	**Indifferent**	**Satisfied**	**Dissatisfied**	**Indifferent**	**Satisfied**	**Dissatisfied**	**Indifferent**	**Satisfied**	**Dissatisfied**	**Indifferent**	**Satisfied**
Skill mismatch							0.039*	0.014*	-0.053*	0.038*	0.013*	-0.051*
							(0.0230)	(0.0081)	(0.0310)	(0.0230)	(0.0081)	(0.0311)
Required educational level	-0.001	-0.000	0.001	-0.008	-0.003	0.010	-0.001	-0.000	0.002	-0.008	-0.003	0.011
	(0.0089)	(0.0031)	(0.0119)	(0.0087)	(0.0031)	(0.0118)	(0.0089)	(0.0031)	(0.0119)	(0.0087)	(0.0031)	(0.0118)
Overeducated	0.015	0.005	-0.021	0.006	0.002	-0.008	0.014	0.005	-0.019	0.005	0.002	-0.006
	(0.0192)	(0.0067)	(0.0259)	(0.0191)	(0.0067)	(0.0258)	(0.0192)	(0.0067)	(0.0259)	(0.0191)	(0.0067)	(0.0258)
Undereducated	-0.000	-0.000	0.001	0.005	0.002	-0.007	0.001	0.000	-0.001	0.006	0.002	-0.008
	(0.0168)	(0.0059)	(0.0227)	(0.0168)	(0.0059)	(0.0226)	(0.0168)	(0.0059)	(0.0226)	(0.0168)	(0.0059)	(0.0226)
Age	0.006	0.002	-0.009	0.005	0.002	-0.007	0.007	0.002	-0.009	0.005	0.002	-0.007
	(0.0051)	(0.0018)	(0.0069)	(0.0051)	(0.0018)	(0.0069)	(0.0051)	(0.0018)	(0.0069)	(0.0051)	(0.0018)	(0.0069)
Age^2/100	-0.009	-0.003	0.013	-0.008	-0.003	0.011	-0.009	-0.003	0.013	-0.008	-0.003	0.011
	(0.0062)	(0.0022)	(0.0083)	(0.0062)	(0.0022)	(0.0083)	(0.0062)	(0.0022)	(0.0083)	(0.0062)	(0.0022)	(0.0083)
Hourly wage	-0.002***	-0.001***	0.003***				-0.002***	-0.001***	0.003***			
	(0.0006)	(0.0002)	(0.0008)				(0.0006)	(0.0002)	(0.0008)			
Male	0.012	0.004	-0.016	0.006	0.002	-0.008	0.012	0.004	-0.016	0.005	0.002	-0.007
	(0.0142)	(0.0049)	(0.0191)	(0.0141)	(0.0049)	(0.0190)	(0.0142)	(0.0049)	(0.0191)	(0.0141)	(0.0049)	(0.0190)
Ethnicity	0.009	0.003	-0.012	0.009	0.003	-0.012	0.007	0.002	-0.009	0.006	0.002	-0.008
	(0.0273)	(0.0095)	(0.0368)	(0.0273)	(0.0096)	(0.0369)	(0.0273)	(0.0095)	(0.0368)	(0.0273)	(0.0096)	(0.0369)
Political	0.008	0.003	-0.010	0.004	0.001	-0.005	0.007	0.003	-0.010	0.004	0.001	-0.005
	(0.0210)	(0.0073)	(0.0283)	(0.0210)	(0.0074)	(0.0283)	(0.0210)	(0.0073)	(0.0283)	(0.0210)	(0.0074)	(0.0283)
Married	-0.014	-0.005	0.019	-0.012	-0.004	0.016	-0.014	-0.005	0.019	-0.012	-0.004	0.016
	(0.0205)	(0.0072)	(0.0277)	(0.0206)	(0.0072)	(0.0278)	(0.0205)	(0.0072)	(0.0277)	(0.0205)	(0.0072)	(0.0277)

Urban registration	-0.029	-0.010	0.039	-0.035*	-0.012*	0.047*	-0.030*	-0.010	0.040*	-0.035**	-0.012*	0.048**
	(0.0180)	(0.0063)	(0.0242)	(0.0180)	(0.0063)	(0.0242)	(0.0180)	(0.0063)	(0.0242)	(0.0179)	(0.0063)	(0.0242)
Full time job	-0.041**	-0.014*	0.055**	-0.040*	-0.014*	0.054*	-0.041**	-0.014**	0.056**	-0.041*	-0.014*	0.055*
	(0.0208)	(0.0073)	(0.0281)	(0.0209)	(0.0074)	(0.0281)	(0.0208)	(0.0073)	(0.0281)	(0.0208)	(0.0074)	(0.0281)
Public sector	-0.011	-0.004	0.015	-0.006	-0.002	0.008	-0.011	-0.004	0.014	-0.005	-0.002	0.007
	(0.0173)	(0.0060)	(0.0233)	(0.0173)	(0.0061)	(0.0233)	(0.0173)	(0.0060)	(0.0233)	(0.0173)	(0.0061)	(0.0233)
Healthy status	-0.061**	-0.021**	0.082**	-0.063**	-0.022**	0.085**	-0.060**	-0.021**	0.081**	-0.062**	-0.022**	0.084**
	(0.0276)	(0.0098)	(0.0372)	(0.0277)	(0.0098)	(0.0374)	(0.0276)	(0.0097)	(0.0372)	(0.0277)	(0.0098)	(0.0374)
Low social status	0.211***	0.074***	-0.285***	0.241***	0.084***	-0.326***	0.209***	0.073***	-0.282***	0.239***	0.084***	-0.323***
	(0.0456)	(0.0162)	(0.0606)	(0.0453)	(0.0163)	(0.0600)	(0.0455)	(0.0162)	(0.0606)	(0.0453)	(0.0162)	(0.0600)
Middle social status	0.129***	0.045***	-0.174***	0.152***	0.053***	-0.206***	0.128***	0.044***	-0.172***	0.151***	0.053***	-0.204***
	(0.0451)	(0.0158)	(0.0605)	(0.0450)	(0.0158)	(0.0602)	(0.0451)	(0.0158)	(0.0604)	(0.0450)	(0.0158)	(0.0602)
Medium-size firm	0.013	0.005	-0.018	0.011	0.004	-0.015	0.012	0.004	-0.016	0.010	0.003	-0.013
	(0.0183)	(0.0064)	(0.0247)	(0.0183)	(0.0064)	(0.0247)	(0.0183)	(0.0064)	(0.0247)	(0.0183)	(0.0064)	(0.0247)
Large-size firm	0.025	0.009	-0.034	0.019	0.007	-0.026	0.024	0.008	-0.032	0.018	0.006	-0.024
	(0.0195)	(0.0068)	(0.0262)	(0.0194)	(0.0068)	(0.0263)	(0.0195)	(0.0068)	(0.0262)	(0.0194)	(0.0068)	(0.0262)
East	-0.063***	-0.022***	0.084***	-0.072***	-0.025***	0.097***	-0.061***	-0.021***	0.082***	-0.070***	-0.025***	0.095***
	(0.0175)	(0.0063)	(0.0235)	(0.0174)	(0.0063)	(0.0234)	(0.0175)	(0.0063)	(0.0235)	(0.0174)	(0.0063)	(0.0234)
Central	-0.095***	-0.033***	0.128***	-0.096***	-0.034***	0.129***	-0.093***	-0.033***	0.126***	-0.094***	-0.033***	0.127***
	(0.0190)	(0.0070)	(0.0254)	(0.0190)	(0.0070)	(0.0255)	(0.0190)	(0.0070)	(0.0254)	(0.0190)	(0.0070)	(0.0255)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		138.33			122.01			141.21			124.73	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0289			0.0255			0.0295			0.0261	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-9 Marginal effects of reporting each answer category of job satisfaction with welfare (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	**Indifferent**	**Satisfied**	**Dissatisfied**	**Indifferent**	**Satisfied**	**Dissatisfied**	**Indifferent**	**Satisfied**	**Dissatisfied**	**Indifferent**	**Satisfied**
Skill mismatch							0.036	0.008	-0.044	0.035	0.007	-0.043
							(0.0240)	(0.0050)	(0.0289)	(0.0240)	(0.0051)	(0.0290)
Required educational level	-0.018**	-0.004*	0.022**	-0.025***	-0.005***	0.030***	-0.019**	-0.004**	0.023**	-0.026***	-0.005***	0.031***
	(0.0092)	(0.0019)	(0.0111)	(0.0090)	(0.0020)	(0.0109)	(0.0092)	(0.0019)	(0.0111)	(0.0091)	(0.0020)	(0.0109)
Overeducated	-0.001	-0.000	0.001	-0.010	-0.002	0.012	-0.002	-0.000	0.002	-0.011	-0.002	0.013
	(0.0202)	(0.0042)	(0.0243)	(0.0200)	(0.0042)	(0.0242)	(0.0202)	(0.0042)	(0.0243)	(0.0200)	(0.0042)	(0.0242)
Undereducated	0.045**	0.009**	-0.054**	0.050***	0.011***	-0.061***	0.046***	0.009**	-0.055***	0.051***	0.011***	-0.062***
	(0.0176)	(0.0038)	(0.0212)	(0.0175)	(0.0039)	(0.0212)	(0.0176)	(0.0038)	(0.0212)	(0.0175)	(0.0039)	(0.0212)
Age	0.005	0.001	-0.006	0.004	0.001	-0.005	0.005	0.001	-0.006	0.004	0.001	-0.005
	(0.0054)	(0.0011)	(0.0065)	(0.0054)	(0.0011)	(0.0065)	(0.0054)	(0.0011)	(0.0065)	(0.0054)	(0.0011)	(0.0065)
$Age^2/100$	-0.007	-0.002	0.009	-0.006	-0.001	0.007	-0.008	-0.002	0.009	-0.006	-0.001	0.007
	(0.0065)	(0.0014)	(0.0078)	(0.0065)	(0.0014)	(0.0079)	(0.0065)	(0.0014)	(0.0078)	(0.0065)	(0.0014)	(0.0079)
Hourly wage	-0.002***	-0.000***	0.003***				-0.002***	-0.000***	0.003***			
	(0.0006)	(0.0001)	(0.0008)				(0.0006)	(0.0001)	(0.0008)			
Male	0.019	0.004	-0.023	0.012	0.003	-0.015	0.018	0.004	-0.022	0.012	0.002	-0.014
	(0.0149)	(0.0031)	(0.0179)	(0.0148)	(0.0031)	(0.0179)	(0.0149)	(0.0031)	(0.0179)	(0.0148)	(0.0031)	(0.0179)
Ethnicity	-0.026	-0.005	0.032	-0.026	-0.006	0.032	-0.029	-0.006	0.035	-0.029	-0.006	0.035
	(0.0288)	(0.0060)	(0.0347)	(0.0288)	(0.0061)	(0.0349)	(0.0288)	(0.0060)	(0.0348)	(0.0289)	(0.0061)	(0.0349)
Political	0.002	0.000	-0.002	-0.002	-0.000	0.002	0.002	0.000	-0.002	-0.002	-0.000	0.003
	(0.0220)	(0.0045)	(0.0265)	(0.0220)	(0.0046)	(0.0266)	(0.0220)	(0.0045)	(0.0265)	(0.0220)	(0.0046)	(0.0266)
Married	-0.011	-0.002	0.014	-0.009	-0.002	0.011	-0.011	-0.002	0.013	-0.008	-0.002	0.010
	(0.0216)	(0.0045)	(0.0261)	(0.0216)	(0.0045)	(0.0261)	(0.0216)	(0.0045)	(0.0261)	(0.0216)	(0.0045)	(0.0261)

Urban registration	-0.068***	-0.014***	0.082***	-0.074***	-0.015***	0.089***	-0.068***	-0.014***	0.082***	-0.074***	-0.016***	0.089***
	(0.0187)	(0.0042)	(0.0226)	(0.0187)	(0.0043)	(0.0226)	(0.0187)	(0.0042)	(0.0226)	(0.0187)	(0.0043)	(0.0226)
Full time job	-0.069***	-0.014***	0.083***	-0.068***	-0.014***	0.082***	-0.070***	-0.014***	0.084***	-0.068***	-0.014***	0.083***
	(0.0219)	(0.0049)	(0.0265)	(0.0219)	(0.0049)	(0.0265)	(0.0219)	(0.0049)	(0.0264)	(0.0219)	(0.0049)	(0.0265)
Public sector	-0.036**	-0.007*	0.044**	-0.031*	-0.006*	0.037*	-0.036**	-0.007*	0.043**	-0.030*	-0.006	0.036*
	(0.0181)	(0.0038)	(0.0218)	(0.0180)	(0.0038)	(0.0218)	(0.0181)	(0.0038)	(0.0218)	(0.0180)	(0.0038)	(0.0218)
Healthy status	-0.022	-0.005	0.026	-0.024	-0.005	0.029	-0.021	-0.004	0.025	-0.023	-0.005	0.028
	(0.0292)	(0.0061)	(0.0353)	(0.0293)	(0.0062)	(0.0354)	(0.0292)	(0.0061)	(0.0352)	(0.0293)	(0.0062)	(0.0354)
Low social status	0.189***	0.039***	-0.229***	0.219***	0.046***	-0.265***	0.188***	0.039***	-0.227***	0.217***	0.046***	-0.263***
	(0.0460)	(0.0102)	(0.0550)	(0.0455)	(0.0104)	(0.0544)	(0.0460)	(0.0102)	(0.0550)	(0.0455)	(0.0104)	(0.0544)
Middle social status	0.117**	0.024**	-0.141***	0.140***	0.029***	-0.169***	0.116**	0.024**	-0.140**	0.139***	0.029***	-0.168***
	(0.0455)	(0.0096)	(0.0547)	(0.0453)	(0.0098)	(0.0544)	(0.0455)	(0.0096)	(0.0547)	(0.0453)	(0.0098)	(0.0544)
Medium-size firm	0.001	0.000	-0.001	-0.001	-0.000	0.001	-0.000	-0.000	0.000	-0.002	-0.000	0.002
	(0.0191)	(0.0039)	(0.0230)	(0.0191)	(0.0040)	(0.0231)	(0.0191)	(0.0039)	(0.0231)	(0.0191)	(0.0040)	(0.0231)
Large-size firm	-0.033	-0.007	0.040	-0.039*	-0.008*	0.047*	-0.034*	-0.007*	0.041*	-0.040*	-0.008*	0.048**
	(0.0204)	(0.0043)	(0.0246)	(0.0203)	(0.0043)	(0.0246)	(0.0204)	(0.0043)	(0.0246)	(0.0203)	(0.0043)	(0.0246)
East	-0.089***	-0.018***	0.108***	-0.099***	-0.021***	0.120***	-0.088***	-0.018***	0.106***	-0.098***	-0.020***	0.118***
	(0.0183)	(0.0043)	(0.0220)	(0.0181)	(0.0045)	(0.0219)	(0.0183)	(0.0043)	(0.0220)	(0.0181)	(0.0045)	(0.0219)
Central	-0.088***	-0.018***	0.107***	-0.089***	-0.019***	0.108***	-0.087***	-0.018***	0.105***	-0.087***	-0.018***	0.106***
	(0.0198)	(0.0046)	(0.0239)	(0.0199)	(0.0047)	(0.0240)	(0.0198)	(0.0046)	(0.0239)	(0.0199)	(0.0047)	(0.0240)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		242.51			226.82			244.80			228.97	
Prob > chi2		0.000			0.000			0.000			0.000	
Pseudo R^2		0.0496			0.0464			0.0500			0.0468	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-10 Marginal effects of reporting each answer category of job satisfaction with workload (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.032	0.010	-0.042	0.032	0.010	-0.042
							(0.0228)	(0.0072)	(0.0300)	(0.0228)	(0.0072)	(0.0300)
Required educational level	-0.026***	-0.008***	0.034***	-0.028***	-0.009***	0.037***	-0.027***	-0.008***	0.035***	-0.029***	-0.009***	0.038***
	(0.0086)	(0.0028)	(0.0112)	(0.0085)	(0.0028)	(0.0111)	(0.0086)	(0.0028)	(0.0112)	(0.0085)	(0.0028)	(0.0111)
Overeducated	-0.033*	-0.010*	0.043*	-0.035*	-0.011*	0.045*	-0.034*	-0.011*	0.045*	-0.036*	-0.011*	0.047*
	(0.0189)	(0.0060)	(0.0248)	(0.0188)	(0.0060)	(0.0247)	(0.0189)	(0.0060)	(0.0248)	(0.0188)	(0.0060)	(0.0247)
Undereducated	0.047***	0.015***	-0.062***	0.049***	0.015***	-0.064***	0.048***	0.015***	-0.063***	0.049***	0.016***	-0.065***
	(0.0165)	(0.0053)	(0.0216)	(0.0164)	(0.0053)	(0.0215)	(0.0165)	(0.0053)	(0.0216)	(0.0164)	(0.0053)	(0.0215)
Age	0.002	0.001	-0.003	0.002	0.001	-0.003	0.002	0.001	-0.003	0.002	0.001	-0.003
	(0.0050)	(0.0016)	(0.0066)	(0.0050)	(0.0016)	(0.0066)	(0.0050)	(0.0016)	(0.0066)	(0.0050)	(0.0016)	(0.0066)
$Age^2/100$	-0.004	-0.001	0.005	-0.004	-0.001	0.005	-0.004	-0.001	0.005	-0.004	-0.001	0.005
	(0.0061)	(0.0019)	(0.0080)	(0.0061)	(0.0019)	(0.0080)	(0.0061)	(0.0019)	(0.0080)	(0.0061)	(0.0019)	(0.0080)
Hourly wage	-0.001	-0.000	0.001				-0.001	-0.000	0.001			
	(0.0004)	(0.0001)	(0.0006)				(0.0004)	(0.0001)	(0.0006)			
Male	0.015	0.005	-0.019	0.013	0.004	-0.017	0.014	0.004	-0.019	0.012	0.004	-0.016
	(0.0140)	(0.0044)	(0.0183)	(0.0139)	(0.0044)	(0.0183)	(0.0140)	(0.0044)	(0.0183)	(0.0139)	(0.0044)	(0.0183)
Ethnicity	-0.002	-0.001	0.003	-0.002	-0.001	0.003	-0.004	-0.001	0.006	-0.004	-0.001	0.006
	(0.0271)	(0.0085)	(0.0357)	(0.0271)	(0.0086)	(0.0357)	(0.0272)	(0.0085)	(0.0357)	(0.0272)	(0.0086)	(0.0357)
Political	0.026	0.008	-0.035	0.025	0.008	-0.032	0.026	0.008	-0.034	0.024	0.008	-0.032
	(0.0205)	(0.0065)	(0.0270)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)
Married	0.018	0.006	-0.024	0.019	0.006	-0.025	0.018	0.006	-0.024	0.019	0.006	-0.025
	(0.0204)	(0.0064)	(0.0268)	(0.0204)	(0.0064)	(0.0268)	(0.0204)	(0.0064)	(0.0268)	(0.0204)	(0.0064)	(0.0268)
Urban registration	-0.032*	-0.010*	0.042*	-0.034*	-0.011*	0.044*	-0.032*	-0.010*	0.042*	-0.034*	-0.011*	0.045*
	(0.0176)	(0.0056)	(0.0232)	(0.0176)	(0.0056)	(0.0231)	(0.0176)	(0.0056)	(0.0232)	(0.0176)	(0.0056)	(0.0231)
Full time job	-0.029	-0.009	0.039	-0.028	-0.009	0.037	-0.030	-0.009	0.039	-0.029	-0.009	0.038
	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)

Public sector	-0.050***	-0.016***	0.066***	-0.048***	-0.015***	0.063***	-0.049***	-0.015***	0.065***	-0.047***	-0.015***	0.062***
	(0.0170)	(0.0055)	(0.0223)	(0.0170)	(0.0055)	(0.0223)	(0.0170)	(0.0055)	(0.0223)	(0.0170)	(0.0055)	(0.0223)
Healthy status	-0.041	-0.013	0.054	-0.042	-0.013	0.055	-0.040	-0.013	0.053	-0.041	-0.013	0.054
	(0.0272)	(0.0086)	(0.0357)	(0.0272)	(0.0087)	(0.0357)	(0.0272)	(0.0086)	(0.0357)	(0.0272)	(0.0086)	(0.0357)
Low social status	0.139***	0.044***	-0.183***	0.150***	0.047***	-0.197***	0.138***	0.043***	-0.181***	0.148***	0.047***	-0.195***
	(0.0423)	(0.0137)	(0.0553)	(0.0417)	(0.0135)	(0.0544)	(0.0423)	(0.0136)	(0.0553)	(0.0417)	(0.0135)	(0.0544)
Middle social status	0.081*	0.025*	-0.106*	0.090**	0.028**	-0.118**	0.080*	0.025*	-0.105*	0.089**	0.028**	-0.116**
	(0.0419)	(0.0133)	(0.0549)	(0.0414)	(0.0132)	(0.0543)	(0.0419)	(0.0132)	(0.0549)	(0.0414)	(0.0131)	(0.0543)
Medium-size firm	0.018	0.006	-0.023	0.017	0.005	-0.022	0.017	0.005	-0.022	0.016	0.005	-0.021
	(0.0179)	(0.0057)	(0.0236)	(0.0179)	(0.0057)	(0.0236)	(0.0180)	(0.0057)	(0.0236)	(0.0179)	(0.0057)	(0.0236)
Large-size firm	0.036*	0.011*	-0.048*	0.034*	0.011*	-0.045*	0.035*	0.011*	-0.046*	0.033*	0.010*	-0.044*
	(0.0191)	(0.0061)	(0.0251)	(0.0191)	(0.0061)	(0.0251)	(0.0191)	(0.0061)	(0.0251)	(0.0191)	(0.0061)	(0.0251)
East	-0.048***	-0.015***	0.063***	-0.050***	-0.016***	0.066***	-0.047***	-0.015***	0.061***	-0.049***	-0.016***	0.065***
	(0.0172)	(0.0056)	(0.0226)	(0.0171)	(0.0056)	(0.0225)	(0.0173)	(0.0056)	(0.0227)	(0.0172)	(0.0056)	(0.0225)
Central	-0.085***	-0.027***	0.112***	-0.085***	-0.027***	0.112***	-0.084***	-0.026***	0.110***	-0.084***	-0.026***	0.110***
	(0.0187)	(0.0063)	(0.0245)	(0.0187)	(0.0063)	(0.0245)	(0.0187)	(0.0063)	(0.0245)	(0.0188)	(0.0063)	(0.0245)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		134.99			133.22			136.94			135.15	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0281			0.0277			0.0285			0.0281	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-11 Marginal effects of reporting each answer category of job satisfaction with working conditions and facilities (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.041**	0.028**	-0.069**	0.040**	0.028**	-0.069**
							(0.0181)	(0.0126)	(0.0306)	(0.0182)	(0.0127)	(0.0307)
Required educational level	-0.030***	-0.021***	0.051***	-0.035***	-0.024***	0.059***	-0.031***	-0.022***	0.052***	-0.036***	-0.025***	0.061***
	(0.0070)	(0.0049)	(0.0116)	(0.0069)	(0.0048)	(0.0115)	(0.0070)	(0.0048)	(0.0116)	(0.0069)	(0.0048)	(0.0114)
Overeducated	-0.034**	-0.024**	0.058**	-0.040***	-0.028***	0.068***	-0.036**	-0.025**	0.060**	-0.042***	-0.029***	0.071***
	(0.0152)	(0.0106)	(0.0256)	(0.0151)	(0.0106)	(0.0255)	(0.0152)	(0.0105)	(0.0256)	(0.0151)	(0.0105)	(0.0255)
Undereducated	0.020	0.014	-0.033	0.024*	0.016*	-0.040*	0.021	0.014	-0.035	0.024*	0.017*	-0.041*
	(0.0131)	(0.0091)	(0.0222)	(0.0131)	(0.0092)	(0.0222)	(0.0131)	(0.0091)	(0.0222)	(0.0131)	(0.0092)	(0.0222)
Age	0.007*	0.005*	-0.012*	0.006	0.004	-0.010	0.007*	0.005*	-0.012*	0.006	0.004	-0.011
	(0.0040)	(0.0028)	(0.0068)	(0.0040)	(0.0028)	(0.0068)	(0.0040)	(0.0028)	(0.0068)	(0.0040)	(0.0028)	(0.0068)
Age^2/100	-0.008	-0.006	0.014*	-0.007	-0.005	0.012	-0.008*	-0.006*	0.014*	-0.007	-0.005	0.012
	(0.0049)	(0.0034)	(0.0082)	(0.0049)	(0.0034)	(0.0082)	(0.0049)	(0.0034)	(0.0082)	(0.0049)	(0.0034)	(0.0082)
Hourly wage	-0.002***	-0.001***	0.003***				-0.002***	-0.001***	0.003***			
	(0.0005)	(0.0003)	(0.0008)				(0.0005)	(0.0003)	(0.0008)			
Male	0.021*	0.014*	-0.035*	0.016	0.011	-0.027	0.020*	0.014*	-0.034*	0.015	0.011	-0.026
	(0.0112)	(0.0078)	(0.0189)	(0.0111)	(0.0078)	(0.0188)	(0.0112)	(0.0078)	(0.0189)	(0.0111)	(0.0077)	(0.0188)
Ethnicity	-0.007	-0.005	0.012	-0.007	-0.005	0.013	-0.010	-0.007	0.017	-0.010	-0.007	0.018
	(0.0214)	(0.0149)	(0.0363)	(0.0214)	(0.0150)	(0.0364)	(0.0214)	(0.0149)	(0.0363)	(0.0215)	(0.0150)	(0.0364)
Political	-0.006	-0.004	0.010	-0.009	-0.006	0.015	-0.006	-0.004	0.011	-0.009	-0.006	0.015
	(0.0165)	(0.0114)	(0.0279)	(0.0165)	(0.0115)	(0.0280)	(0.0165)	(0.0114)	(0.0279)	(0.0165)	(0.0115)	(0.0279)
Married	-0.013	-0.009	0.021	-0.011	-0.008	0.018	-0.012	-0.009	0.021	-0.010	-0.007	0.018
	(0.0162)	(0.0113)	(0.0275)	(0.0162)	(0.0113)	(0.0275)	(0.0162)	(0.0113)	(0.0274)	(0.0162)	(0.0113)	(0.0275)
Urban registration	-0.019	-0.013	0.032	-0.024*	-0.017*	0.040*	-0.019	-0.013	0.033	-0.024*	-0.017*	0.041*
	(0.0140)	(0.0098)	(0.0238)	(0.0140)	(0.0098)	(0.0237)	(0.0140)	(0.0098)	(0.0238)	(0.0140)	(0.0098)	(0.0237)
Full time job	-0.036**	-0.025**	0.061**	-0.036**	-0.025**	0.061**	-0.037**	-0.026**	0.062**	-0.036**	-0.025**	0.062**
	(0.0162)	(0.0114)	(0.0275)	(0.0162)	(0.0114)	(0.0275)	(0.0162)	(0.0113)	(0.0274)	(0.0162)	(0.0114)	(0.0275)

Public sector	-0.018	-0.012	0.030	-0.013	-0.009	0.023	-0.017	-0.012	0.028	-0.013	-0.009	0.021
	(0.0136)	(0.0095)	(0.0230)	(0.0136)	(0.0095)	(0.0230)	(0.0136)	(0.0094)	(0.0230)	(0.0136)	(0.0095)	(0.0230)
Healthy status	-0.001	-0.001	0.002	-0.003	-0.002	0.005	-0.000	-0.000	0.001	-0.002	-0.001	0.003
	(0.0216)	(0.0150)	(0.0366)	(0.0216)	(0.0151)	(0.0367)	(0.0216)	(0.0150)	(0.0365)	(0.0216)	(0.0151)	(0.0367)
Low social status	0.090***	0.062***	-0.152***	0.111***	0.077***	-0.188***	0.087**	0.061**	-0.148**	0.109***	0.076***	-0.184***
	(0.0342)	(0.0237)	(0.0576)	(0.0339)	(0.0236)	(0.0569)	(0.0341)	(0.0237)	(0.0575)	(0.0338)	(0.0235)	(0.0569)
Middle social status	0.042	0.029	-0.072	0.059*	0.041*	-0.100*	0.041	0.028	-0.069	0.057*	0.040*	-0.097*
	(0.0338)	(0.0235)	(0.0572)	(0.0336)	(0.0234)	(0.0568)	(0.0337)	(0.0234)	(0.0571)	(0.0335)	(0.0234)	(0.0568)
Medium-size firm	-0.010	-0.007	0.017	-0.012	-0.008	0.020	-0.012	-0.008	0.020	-0.013	-0.009	0.022
	(0.0142)	(0.0099)	(0.0241)	(0.0143)	(0.0100)	(0.0242)	(0.0142)	(0.0099)	(0.0241)	(0.0143)	(0.0100)	(0.0242)
Large-size firm	-0.036**	-0.025**	0.061**	-0.040***	-0.028***	0.068***	-0.037**	-0.026**	0.063**	-0.041***	-0.029***	0.070***
	(0.0153)	(0.0106)	(0.0258)	(0.0153)	(0.0107)	(0.0258)	(0.0153)	(0.0106)	(0.0258)	(0.0153)	(0.0107)	(0.0258)
East	-0.027**	-0.019**	0.047**	-0.035**	-0.024**	0.059**	-0.026*	-0.018*	0.044*	-0.033**	-0.023**	0.056**
	(0.0138)	(0.0096)	(0.0234)	(0.0137)	(0.0096)	(0.0232)	(0.0138)	(0.0096)	(0.0233)	(0.0137)	(0.0096)	(0.0232)
Central	-0.030**	-0.021**	0.051**	-0.030**	-0.021**	0.051**	-0.028*	-0.020*	0.048*	-0.028*	-0.020*	0.048*
	(0.0149)	(0.0104)	(0.0252)	(0.0149)	(0.0104)	(0.0253)	(0.0149)	(0.0104)	(0.0252)	(0.0149)	(0.0104)	(0.0253)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		180.58			166.93			185.62			171.90	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0395			0.0366			0.0406			0.0376	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-12 Marginal effects of reporting each answer category of job satisfaction with colleagues (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.010*	0.040*	-0.050*	0.010*	0.040*	-0.050*
							(0.0056)	(0.0226)	(0.0280)	(0.0056)	(0.0225)	(0.0280)
Required educational level	-0.008***	-0.032***	0.039***	-0.008***	-0.034***	0.043***	-0.008***	-0.032***	0.040***	-0.009***	-0.035***	0.044***
	(0.0024)	(0.0090)	(0.0111)	(0.0023)	(0.0088)	(0.0109)	(0.0024)	(0.0090)	(0.0111)	(0.0024)	(0.0088)	(0.0109)
Overeducated	-0.008*	-0.034*	0.043*	-0.009*	-0.037*	0.046*	-0.009*	-0.036*	0.045*	-0.009*	-0.039**	0.048**
	(0.0048)	(0.0194)	(0.0241)	(0.0048)	(0.0192)	(0.0240)	(0.0048)	(0.0194)	(0.0241)	(0.0048)	(0.0193)	(0.0240)
Undereducated	0.003	0.014	-0.018	0.004	0.016	-0.020	0.004	0.015	-0.019	0.004	0.017	-0.021
	(0.0040)	(0.0165)	(0.0205)	(0.0040)	(0.0164)	(0.0204)	(0.0040)	(0.0165)	(0.0205)	(0.0040)	(0.0164)	(0.0204)
Age	0.000	0.001	-0.002	0.000	0.001	-0.001	0.000	0.002	-0.002	0.000	0.001	-0.001
	(0.0012)	(0.0051)	(0.0063)	(0.0012)	(0.0051)	(0.0063)	(0.0012)	(0.0051)	(0.0063)	(0.0012)	(0.0051)	(0.0063)
Age^2/100	-0.001	-0.002	0.003	-0.000	-0.002	0.002	-0.001	-0.003	0.003	-0.001	-0.002	0.003
	(0.0015)	(0.0062)	(0.0077)	(0.0015)	(0.0062)	(0.0077)	(0.0015)	(0.0062)	(0.0077)	(0.0015)	(0.0062)	(0.0077)
Hourly wage	-0.000	-0.001	0.001				-0.000	-0.001	0.001			
	(0.0002)	(0.0006)	(0.0008)				(0.0002)	(0.0006)	(0.0008)			
Male	0.000	0.002	-0.002	-0.000	-0.001	0.001	0.000	0.001	-0.002	-0.000	-0.001	0.002
	(0.0034)	(0.0141)	(0.0175)	(0.0034)	(0.0140)	(0.0174)	(0.0034)	(0.0141)	(0.0175)	(0.0034)	(0.0140)	(0.0174)
Ethnicity	0.010	0.042	-0.053	0.010	0.042	-0.053	0.010	0.039	-0.049	0.010	0.039	-0.049
	(0.0069)	(0.0281)	(0.0349)	(0.0069)	(0.0281)	(0.0349)	(0.0069)	(0.0281)	(0.0349)	(0.0069)	(0.0281)	(0.0349)
Political	-0.016***	-0.064***	0.080***	-0.016***	-0.066***	0.082***	-0.016***	-0.065***	0.081***	-0.016***	-0.066***	0.083***
	(0.0058)	(0.0226)	(0.0281)	(0.0058)	(0.0226)	(0.0281)	(0.0058)	(0.0226)	(0.0281)	(0.0058)	(0.0226)	(0.0281)
Married	0.003	0.014	-0.018	0.004	0.015	-0.019	0.004	0.015	-0.018	0.004	0.015	-0.019
	(0.0050)	(0.0205)	(0.0255)	(0.0050)	(0.0205)	(0.0255)	(0.0050)	(0.0205)	(0.0255)	(0.0050)	(0.0205)	(0.0255)
Urban registration	0.007*	0.030*	-0.038*	0.007	0.028	-0.035	0.007*	0.030*	-0.037*	0.007	0.028	-0.034
	(0.0044)	(0.0176)	(0.0219)	(0.0043)	(0.0175)	(0.0218)	(0.0044)	(0.0176)	(0.0219)	(0.0043)	(0.0175)	(0.0218)
Full time job	-0.011**	-0.046**	0.057**	-0.011**	-0.046**	0.057**	-0.011**	-0.047**	0.058**	-0.011**	-0.046**	0.058**
	(0.0050)	(0.0197)	(0.0245)	(0.0050)	(0.0197)	(0.0245)	(0.0050)	(0.0197)	(0.0245)	(0.0050)	(0.0197)	(0.0244)

Public sector	0.001	0.003	-0.004	0.001	0.006	-0.007	0.001	0.004	-0.005	0.002	0.007	-0.008
	(0.0042)	(0.0174)	(0.0216)	(0.0042)	(0.0173)	(0.0216)	(0.0042)	(0.0174)	(0.0216)	(0.0042)	(0.0173)	(0.0216)
Healthy status	-0.002	-0.007	0.009	-0.002	-0.008	0.010	-0.002	-0.007	0.008	-0.002	-0.007	0.009
	(0.0065)	(0.0268)	(0.0334)	(0.0066)	(0.0269)	(0.0334)	(0.0065)	(0.0268)	(0.0333)	(0.0065)	(0.0268)	(0.0334)
Low social status	0.003	0.011	-0.013	0.006	0.024	-0.029	0.002	0.008	-0.010	0.005	0.021	-0.026
	(0.0101)	(0.0416)	(0.0517)	(0.0100)	(0.0409)	(0.0508)	(0.0101)	(0.0415)	(0.0516)	(0.0100)	(0.0409)	(0.0508)
Middle social status	-0.006	-0.025	0.031	-0.003	-0.014	0.018	-0.006	-0.026	0.032	-0.004	-0.016	0.019
	(0.0101)	(0.0411)	(0.0511)	(0.0099)	(0.0407)	(0.0507)	(0.0100)	(0.0411)	(0.0511)	(0.0099)	(0.0407)	(0.0506)
Medium-size firm	-0.014***	-0.057***	0.070***	-0.014***	-0.058***	0.072***	-0.014***	-0.058***	0.072***	-0.014***	-0.059***	0.074***
	(0.0046)	(0.0178)	(0.0221)	(0.0046)	(0.0177)	(0.0221)	(0.0046)	(0.0178)	(0.0221)	(0.0046)	(0.0178)	(0.0221)
Large-size firm	-0.017***	-0.069***	0.086***	-0.017***	-0.071***	0.089***	-0.017***	-0.070***	0.087***	-0.018***	-0.073***	0.090***
	(0.0051)	(0.0193)	(0.0239)	(0.0051)	(0.0192)	(0.0238)	(0.0051)	(0.0193)	(0.0239)	(0.0051)	(0.0192)	(0.0238)
East	0.005	0.020	-0.025	0.004	0.017	-0.021	0.005	0.022	-0.027	0.005	0.019	-0.023
	(0.0043)	(0.0174)	(0.0217)	(0.0042)	(0.0173)	(0.0215)	(0.0043)	(0.0174)	(0.0217)	(0.0043)	(0.0173)	(0.0215)
Central	-0.005	-0.021	0.027	-0.005	-0.021	0.026	-0.005	-0.019	0.024	-0.005	-0.019	0.023
	(0.0047)	(0.0191)	(0.0238)	(0.0047)	(0.0191)	(0.0238)	(0.0047)	(0.0192)	(0.0238)	(0.0047)	(0.0192)	(0.0239)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		89.52			87.08			92.61			90.18	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0322			0.0313			0.0333			0.0324	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-13 Marginal effects of reporting each answer category of job satisfaction with the relationship with the boss (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.031***	0.078***	-0.108***	0.031***	0.077***	-0.108***
							(0.0091)	(0.0224)	(0.0312)	(0.0091)	(0.0225)	(0.0313)
Required educational level	-0.023***	-0.057***	0.080***	-0.025***	-0.062***	0.087***	-0.023***	-0.059***	0.082***	-0.025***	-0.064***	0.089***
	(0.0039)	(0.0089)	(0.0123)	(0.0039)	(0.0087)	(0.0121)	(0.0039)	(0.0089)	(0.0123)	(0.0039)	(0.0087)	(0.0121)
Overeducated	-0.010	-0.025	0.035	-0.013*	-0.032*	0.045*	-0.011	-0.028	0.039	-0.014*	-0.035*	0.049*
	(0.0077)	(0.0192)	(0.0268)	(0.0076)	(0.0191)	(0.0267)	(0.0076)	(0.0192)	(0.0268)	(0.0076)	(0.0191)	(0.0266)
Undereducated	0.009	0.022	-0.031	0.010	0.026	-0.037	0.010	0.025	-0.034	0.011*	0.029*	-0.040*
	(0.0066)	(0.0167)	(0.0233)	(0.0066)	(0.0166)	(0.0232)	(0.0066)	(0.0166)	(0.0232)	(0.0066)	(0.0166)	(0.0232)
Age	0.001	0.003	-0.004	0.001	0.003	-0.003	0.001	0.004	-0.005	0.001	0.003	-0.004
	(0.0020)	(0.0051)	(0.0071)	(0.0020)	(0.0051)	(0.0071)	(0.0020)	(0.0051)	(0.0071)	(0.0020)	(0.0051)	(0.0071)
Age^2/100	-0.002	-0.004	0.006	-0.001	-0.003	0.005	-0.002	-0.005	0.007	-0.002	-0.004	0.006
	(0.0025)	(0.0062)	(0.0086)	(0.0025)	(0.0062)	(0.0086)	(0.0024)	(0.0062)	(0.0086)	(0.0024)	(0.0062)	(0.0086)
Hourly wage	-0.001***	-0.002***	0.003***				-0.001***	-0.002***	0.003***			
	(0.0003)	(0.0007)	(0.0009)				(0.0003)	(0.0007)	(0.0009)			
Male	-0.006	-0.016	0.023	-0.008	-0.021	0.029	-0.007	-0.017	0.024	-0.009	-0.022	0.031
	(0.0056)	(0.0141)	(0.0197)	(0.0056)	(0.0140)	(0.0196)	(0.0056)	(0.0141)	(0.0196)	(0.0056)	(0.0140)	(0.0196)
Ethnicity	0.000	0.001	-0.001	0.000	0.001	-0.001	-0.002	-0.005	0.007	-0.002	-0.005	0.007
	(0.0107)	(0.0270)	(0.0376)	(0.0107)	(0.0270)	(0.0377)	(0.0107)	(0.0269)	(0.0376)	(0.0107)	(0.0270)	(0.0377)
Political	-0.019**	-0.047**	0.066**	-0.020**	-0.051**	0.071**	-0.019**	-0.048**	0.067**	-0.020**	-0.052**	0.072**
	(0.0088)	(0.0218)	(0.0304)	(0.0088)	(0.0218)	(0.0304)	(0.0088)	(0.0218)	(0.0304)	(0.0088)	(0.0218)	(0.0304)
Married	-0.009	-0.023	0.032	-0.008	-0.021	0.029	-0.009	-0.022	0.031	-0.008	-0.021	0.029
	(0.0081)	(0.0203)	(0.0284)	(0.0081)	(0.0203)	(0.0284)	(0.0080)	(0.0203)	(0.0283)	(0.0080)	(0.0203)	(0.0283)
Urban registration	-0.000	-0.001	0.001	-0.002	-0.006	0.008	-0.001	-0.001	0.002	-0.002	-0.006	0.009
	(0.0070)	(0.0178)	(0.0248)	(0.0070)	(0.0177)	(0.0248)	(0.0070)	(0.0177)	(0.0248)	(0.0070)	(0.0177)	(0.0247)
Full time job	-0.017**	-0.043**	0.060**	-0.017**	-0.043**	0.059**	-0.017**	-0.043**	0.060**	-0.017**	-0.043**	0.060**
	(0.0081)	(0.0203)	(0.0283)	(0.0081)	(0.0203)	(0.0283)	(0.0081)	(0.0202)	(0.0282)	(0.0081)	(0.0202)	(0.0282)

Public sector	-0.019***	-0.048***	0.067***	-0.018**	-0.044**	0.062**	-0.018***	-0.047***	0.065***	-0.017**	-0.043**	0.059**
	(0.0070)	(0.0172)	(0.0240)	(0.0070)	(0.0172)	(0.0240)	(0.0069)	(0.0172)	(0.0240)	(0.0069)	(0.0172)	(0.0240)
Healthy status	0.007	0.018	-0.025	0.006	0.015	-0.021	0.008	0.020	-0.027	0.007	0.017	-0.023
	(0.0110)	(0.0277)	(0.0387)	(0.0110)	(0.0277)	(0.0387)	(0.0110)	(0.0276)	(0.0386)	(0.0110)	(0.0277)	(0.0386)
Low social status	0.034*	0.086*	-0.120*	0.044**	0.110**	-0.154**	0.032*	0.082*	-0.114*	0.042**	0.106**	-0.148**
	(0.0179)	(0.0447)	(0.0624)	(0.0178)	(0.0441)	(0.0616)	(0.0178)	(0.0446)	(0.0622)	(0.0177)	(0.0440)	(0.0615)
Middle social status	0.023	0.059	-0.082	0.031*	0.078*	-0.108*	0.022	0.056	-0.078	0.030*	0.075*	-0.104*
	(0.0177)	(0.0443)	(0.0619)	(0.0176)	(0.0440)	(0.0615)	(0.0176)	(0.0442)	(0.0617)	(0.0175)	(0.0439)	(0.0613)
Medium-size firm	0.009	0.024	-0.033	0.009	0.022	-0.030	0.008	0.021	-0.029	0.008	0.019	-0.027
	(0.0073)	(0.0182)	(0.0254)	(0.0073)	(0.0182)	(0.0255)	(0.0072)	(0.0182)	(0.0254)	(0.0072)	(0.0182)	(0.0254)
Large-size firm	0.015**	0.039**	-0.054**	0.014*	0.034*	-0.048*	0.014*	0.036*	-0.051*	0.013	0.032*	-0.045*
	(0.0078)	(0.0194)	(0.0270)	(0.0077)	(0.0193)	(0.0270)	(0.0077)	(0.0193)	(0.0270)	(0.0077)	(0.0193)	(0.0270)
East	-0.004	-0.011	0.015	-0.007	-0.018	0.025	-0.003	-0.007	0.010	-0.006	-0.015	0.021
	(0.0069)	(0.0174)	(0.0244)	(0.0069)	(0.0173)	(0.0242)	(0.0069)	(0.0174)	(0.0243)	(0.0069)	(0.0173)	(0.0242)
Central	-0.026***	-0.065***	0.091***	-0.026***	-0.065***	0.091***	-0.024***	-0.061***	0.085***	-0.024***	-0.061***	0.085***
	(0.0078)	(0.0190)	(0.0264)	(0.0078)	(0.0190)	(0.0265)	(0.0077)	(0.0190)	(0.0264)	(0.0077)	(0.0190)	(0.0265)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		165.60			156.17			177.34			167.74	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0435			0.0410			0.0466			0.0441	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-14 Marginal effects of reporting each answer category of job satisfaction with commuting distance to job location (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.012	0.011	-0.022	0.012	0.011	-0.022
							(0.0169)	(0.0152)	(0.0320)	(0.0169)	(0.0152)	(0.0321)
Required educational level	-0.007	-0.007	0.014	-0.011*	-0.010*	0.020*	-0.008	-0.007	0.015	-0.011*	-0.010*	0.021*
	(0.0065)	(0.0059)	(0.0124)	(0.0064)	(0.0058)	(0.0122)	(0.0066)	(0.0059)	(0.0124)	(0.0065)	(0.0058)	(0.0122)
Overeducated	-0.005	-0.004	0.009	-0.009	-0.008	0.017	-0.005	-0.005	0.010	-0.009	-0.008	0.017
	(0.0142)	(0.0128)	(0.0270)	(0.0141)	(0.0127)	(0.0268)	(0.0142)	(0.0128)	(0.0270)	(0.0141)	(0.0127)	(0.0269)
Undereducated	0.005	0.005	-0.010	0.008	0.007	-0.015	0.005	0.005	-0.010	0.008	0.007	-0.015
	(0.0123)	(0.0111)	(0.0234)	(0.0123)	(0.0111)	(0.0234)	(0.0123)	(0.0111)	(0.0234)	(0.0123)	(0.0111)	(0.0234)
Age	0.005	0.004	-0.009	0.004	0.004	-0.008	0.005	0.004	-0.009	0.004	0.004	-0.008
	(0.0038)	(0.0034)	(0.0072)	(0.0038)	(0.0034)	(0.0072)	(0.0038)	(0.0034)	(0.0072)	(0.0038)	(0.0034)	(0.0072)
$Age^2/100$	-0.007	-0.006	0.013	-0.006	-0.006	0.012	-0.007	-0.006	0.013	-0.006	-0.006	0.012
	(0.0046)	(0.0041)	(0.0087)	(0.0046)	(0.0041)	(0.0087)	(0.0046)	(0.0041)	(0.0087)	(0.0046)	(0.0041)	(0.0087)
Hourly wage	-0.001**	-0.001**	0.002**				-0.001**	-0.001**	0.002**			
	(0.0005)	(0.0004)	(0.0009)				(0.0005)	(0.0004)	(0.0009)			
Male	0.019*	0.017*	-0.036*	0.016	0.014	-0.029	0.019*	0.017*	-0.036*	0.015	0.014	-0.029
	(0.0105)	(0.0094)	(0.0198)	(0.0104)	(0.0094)	(0.0197)	(0.0105)	(0.0094)	(0.0198)	(0.0104)	(0.0094)	(0.0197)
Ethnicity	0.025	0.023	-0.048	0.025	0.023	-0.048	0.025	0.022	-0.047	0.024	0.022	-0.046
	(0.0204)	(0.0183)	(0.0387)	(0.0205)	(0.0184)	(0.0388)	(0.0205)	(0.0184)	(0.0388)	(0.0205)	(0.0184)	(0.0389)
Political	-0.044***	-0.040***	0.084***	-0.046***	-0.041***	0.087***	-0.044***	-0.040***	0.084***	-0.046***	-0.041***	0.087***
	(0.0160)	(0.0143)	(0.0301)	(0.0160)	(0.0143)	(0.0301)	(0.0160)	(0.0143)	(0.0301)	(0.0160)	(0.0143)	(0.0301)
Married	0.002	0.002	-0.004	0.003	0.003	-0.006	0.002	0.002	-0.004	0.003	0.003	-0.006
	(0.0151)	(0.0136)	(0.0287)	(0.0151)	(0.0136)	(0.0288)	(0.0151)	(0.0136)	(0.0287)	(0.0151)	(0.0136)	(0.0288)
Urban registration	-0.001	-0.001	0.001	-0.004	-0.004	0.008	-0.001	-0.001	0.002	-0.004	-0.004	0.008
	(0.0132)	(0.0118)	(0.0250)	(0.0131)	(0.0118)	(0.0249)	(0.0132)	(0.0118)	(0.0250)	(0.0131)	(0.0118)	(0.0249)

Full time job	-0.027*	-0.024*	0.051*	-0.026*	-0.024*	0.050*	-0.027*	-0.024*	0.051*	-0.026*	-0.024*	0.050*
	(0.0152)	(0.0136)	(0.0288)	(0.0152)	(0.0136)	(0.0288)	(0.0152)	(0.0136)	(0.0288)	(0.0152)	(0.0136)	(0.0288)
Public sector	-0.009	-0.008	0.018	-0.007	-0.006	0.013	-0.009	-0.008	0.017	-0.006	-0.006	0.012
	(0.0127)	(0.0114)	(0.0240)	(0.0126)	(0.0114)	(0.0240)	(0.0127)	(0.0114)	(0.0240)	(0.0126)	(0.0114)	(0.0240)
Healthy status	0.009	0.008	-0.016	0.007	0.007	-0.014	0.009	0.008	-0.017	0.008	0.007	-0.014
	(0.0205)	(0.0185)	(0.0390)	(0.0206)	(0.0185)	(0.0391)	(0.0205)	(0.0184)	(0.0390)	(0.0206)	(0.0185)	(0.0390)
Low social status	0.085***	0.077***	-0.162***	0.101***	0.091***	-0.192***	0.085**	0.076***	-0.161***	0.101***	0.091***	-0.191***
	(0.0331)	(0.0295)	(0.0623)	(0.0327)	(0.0291)	(0.0614)	(0.0331)	(0.0295)	(0.0623)	(0.0327)	(0.0291)	(0.0614)
Middle social status	0.043	0.039	-0.082	0.056*	0.050*	-0.106*	0.043	0.039	-0.082	0.056*	0.050*	-0.106*
	(0.0327)	(0.0293)	(0.0618)	(0.0324)	(0.0291)	(0.0614)	(0.0327)	(0.0293)	(0.0619)	(0.0324)	(0.0291)	(0.0614)
Medium-size firm	0.018	0.016	-0.033	0.016	0.015	-0.031	0.017	0.015	-0.033	0.016	0.014	-0.030
	(0.0134)	(0.0120)	(0.0253)	(0.0134)	(0.0120)	(0.0253)	(0.0134)	(0.0120)	(0.0253)	(0.0134)	(0.0120)	(0.0254)
Large-size firm	-0.005	-0.005	0.010	-0.008	-0.007	0.016	-0.006	-0.005	0.011	-0.009	-0.008	0.016
	(0.0143)	(0.0129)	(0.0272)	(0.0143)	(0.0129)	(0.0272)	(0.0144)	(0.0129)	(0.0272)	(0.0143)	(0.0129)	(0.0272)
East	-0.012	-0.011	0.023	-0.017	-0.015	0.032	-0.012	-0.010	0.022	-0.016	-0.015	0.031
	(0.0129)	(0.0115)	(0.0244)	(0.0128)	(0.0115)	(0.0242)	(0.0129)	(0.0116)	(0.0244)	(0.0128)	(0.0115)	(0.0242)
Central	-0.054***	-0.049***	0.103***	-0.054***	-0.049***	0.103***	-0.054***	-0.048***	0.102***	-0.053***	-0.048***	0.101***
	(0.0142)	(0.0126)	(0.0266)	(0.0143)	(0.0127)	(0.0267)	(0.0143)	(0.0127)	(0.0266)	(0.0143)	(0.0127)	(0.0267)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		87.36			80.26			87.84			80.74	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0210			0.0193			0.0211			0.0194	

*** p<0.10, ** p<0.05, *** p<0.010**

Table 3-15 Marginal effects of reporting each answer category of job satisfaction with housing benefits (controlling for required educational level)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.073**	-0.009**	-0.064**	0.072**	-0.009**	-0.063**
							(0.0302)	(0.0041)	(0.0264)	(0.0303)	(0.0040)	(0.0265)
Required educational level	0.023**	-0.003*	-0.020**	0.015	-0.002	-0.013	0.022*	-0.003*	-0.019*	0.014	-0.002	-0.012
	(0.0113)	(0.0015)	(0.0099)	(0.0111)	(0.0014)	(0.0097)	(0.0113)	(0.0015)	(0.0099)	(0.0111)	(0.0014)	(0.0097)
Overeducated	-0.063**	0.008**	0.055**	-0.072***	0.009***	0.063***	-0.066***	0.008**	0.057***	-0.075***	0.009***	0.066***
	(0.0246)	(0.0033)	(0.0215)	(0.0244)	(0.0034)	(0.0214)	(0.0246)	(0.0034)	(0.0215)	(0.0244)	(0.0034)	(0.0214)
Undereducated	-0.032	0.004	0.028	-0.025	0.003	0.022	-0.030	0.004	0.026	-0.024	0.003	0.021
	(0.0217)	(0.0028)	(0.0190)	(0.0217)	(0.0027)	(0.0190)	(0.0217)	(0.0028)	(0.0190)	(0.0217)	(0.0027)	(0.0190)
Age	0.010	-0.001	-0.008	0.008	-0.001	-0.007	0.010	-0.001	-0.009	0.009	-0.001	-0.007
	(0.0066)	(0.0009)	(0.0058)	(0.0066)	(0.0008)	(0.0058)	(0.0066)	(0.0009)	(0.0058)	(0.0066)	(0.0008)	(0.0058)
$Age^2/100$	-0.013	0.002	0.011	-0.011	0.001	0.010	-0.013	0.002	0.011	-0.011	0.001	0.010
	(0.0080)	(0.0010)	(0.0070)	(0.0080)	(0.0010)	(0.0070)	(0.0080)	(0.0010)	(0.0070)	(0.0080)	(0.0010)	(0.0070)
Hourly wage	-0.003***	0.000***	0.002***				-0.003***	0.000***	0.002***			
	(0.0008)	(0.0001)	(0.0007)				(0.0008)	(0.0001)	(0.0007)			
Male	0.019	-0.002	-0.017	0.012	-0.001	-0.010	0.019	-0.002	-0.016	0.011	-0.001	-0.010
	(0.0183)	(0.0023)	(0.0160)	(0.0182)	(0.0023)	(0.0160)	(0.0183)	(0.0023)	(0.0160)	(0.0182)	(0.0023)	(0.0159)
Ethnicity	-0.006	0.001	0.005	-0.006	0.001	0.005	-0.011	0.001	0.009	-0.011	0.001	0.009
	(0.0358)	(0.0045)	(0.0312)	(0.0358)	(0.0045)	(0.0314)	(0.0358)	(0.0045)	(0.0312)	(0.0359)	(0.0045)	(0.0314)
Political	-0.005	0.001	0.004	-0.010	0.001	0.009	-0.005	0.001	0.005	-0.010	0.001	0.009
	(0.0267)	(0.0034)	(0.0233)	(0.0267)	(0.0033)	(0.0234)	(0.0267)	(0.0034)	(0.0233)	(0.0267)	(0.0033)	(0.0233)
Married	-0.094***	0.012***	0.082***	-0.091***	0.011***	0.079***	-0.093***	0.012***	0.081***	-0.090***	0.011***	0.079***
	(0.0267)	(0.0038)	(0.0234)	(0.0268)	(0.0037)	(0.0235)	(0.0267)	(0.0038)	(0.0234)	(0.0267)	(0.0037)	(0.0235)

Urban registration	-0.057**	0.007**	0.049**	-0.063***	0.008**	0.055***	-0.057**	0.007**	0.050**	-0.063***	0.008**	0.055***
	(0.0233)	(0.0031)	(0.0204)	(0.0233)	(0.0031)	(0.0204)	(0.0233)	(0.0031)	(0.0204)	(0.0232)	(0.0031)	(0.0204)
Full time job	-0.084***	0.011***	0.074***	-0.082***	0.010***	0.072***	-0.085***	0.011***	0.075***	-0.083***	0.010***	0.072***
	(0.0273)	(0.0038)	(0.0239)	(0.0273)	(0.0037)	(0.0239)	(0.0272)	(0.0038)	(0.0239)	(0.0273)	(0.0037)	(0.0239)
Public sector	-0.044*	0.006*	0.038*	-0.037	0.005	0.032	-0.042*	0.005*	0.037*	-0.035	0.004	0.031
	(0.0224)	(0.0029)	(0.0195)	(0.0223)	(0.0029)	(0.0195)	(0.0223)	(0.0029)	(0.0195)	(0.0223)	(0.0029)	(0.0195)
Healthy status	-0.020	0.003	0.018	-0.023	0.003	0.020	-0.018	0.002	0.016	-0.021	0.003	0.018
	(0.0358)	(0.0045)	(0.0312)	(0.0359)	(0.0045)	(0.0314)	(0.0357)	(0.0045)	(0.0312)	(0.0358)	(0.0045)	(0.0313)
Low social status	0.183***	-0.023***	-0.160***	0.218***	-0.027***	-0.191***	0.179***	-0.023***	-0.157***	0.214***	-0.027***	-0.187***
	(0.0539)	(0.0077)	(0.0471)	(0.0531)	(0.0079)	(0.0465)	(0.0539)	(0.0077)	(0.0471)	(0.0531)	(0.0079)	(0.0464)
Middle social status	0.094*	-0.012*	-0.082*	0.122**	-0.015**	-0.107**	0.092*	-0.012*	-0.080*	0.120**	-0.015**	-0.105**
	(0.0534)	(0.0070)	(0.0466)	(0.0529)	(0.0071)	(0.0463)	(0.0533)	(0.0070)	(0.0466)	(0.0529)	(0.0071)	(0.0462)
Medium-size firm	0.046*	-0.006*	-0.040*	0.043*	-0.005*	-0.038*	0.043*	-0.005*	-0.038*	0.041*	-0.005*	-0.036*
	(0.0236)	(0.0031)	(0.0206)	(0.0236)	(0.0031)	(0.0207)	(0.0236)	(0.0031)	(0.0206)	(0.0236)	(0.0031)	(0.0207)
Large-size firm	0.014	-0.002	-0.013	0.007	-0.001	-0.006	0.012	-0.001	-0.010	0.005	-0.001	-0.004
	(0.0251)	(0.0032)	(0.0220)	(0.0251)	(0.0031)	(0.0220)	(0.0251)	(0.0032)	(0.0220)	(0.0251)	(0.0031)	(0.0220)
East	-0.081***	0.010***	0.071***	-0.092***	0.011***	0.080***	-0.078***	0.010***	0.068***	-0.089***	0.011***	0.078***
	(0.0228)	(0.0032)	(0.0200)	(0.0226)	(0.0033)	(0.0198)	(0.0228)	(0.0032)	(0.0200)	(0.0226)	(0.0033)	(0.0198)
Central	-0.110***	0.014***	0.096***	-0.110***	0.014***	0.097***	-0.106***	0.013***	0.093***	-0.107***	0.013***	0.093***
	(0.0245)	(0.0037)	(0.0215)	(0.0246)	(0.0037)	(0.0216)	(0.0246)	(0.0037)	(0.0216)	(0.0246)	(0.0036)	(0.0216)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		151.48			138.25			157.32			143.91	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0308			0.0281			0.0320			0.0292	

*** p<0.10, ** p<0.05, *** p<0.010**

Chapter 4 Education and educational mismatch: Evidence for the rural-to-urban migrant workers in China

4.1 Introduction

Since the economic reform in 1978, China has experienced a rocket-like rise of economic growth. According to the statistics from the World Bank, the average growth rate of real GDP in China was about 10% a year from 1978 to 2014. Recently, China has become the second largest economy in the World[60]. People usually use "The World Factory" or "Made in China" to describe the significant economic development China has made. An important reason behind this "miracle", is the rural-to-urban migration of workers. This group of people, have provided the cheap labour that has helped China to achieve a high rate of economic growth for over three decades (Zhang and Song, 2003); (Meng, 2012); (Akgüç et al., 2014); (Cheng et al., 2014b).

"Every three months I could send about 660 yuan back to my hometown to my father as well as keep a few hundred for myself. I thought I could work there for at least another few years."

"I was satisfied with my job in the toy plant. It was terribly hard work, but we had fun too. We had a plan. Before we went back home for marriage, we were going to save money to go to Beijing. It was such a big dream."

"I left the factory in May 1999 and was introduced by my cousin to the toy company. It was a big plant...We worked very hard, from sunrise to midnight, twelve hours a day. Every day I would be worn out, all my energy gone....But I felt happy there. I had dozens of relatives and friends; we chatted a lot and helped each other"[61]

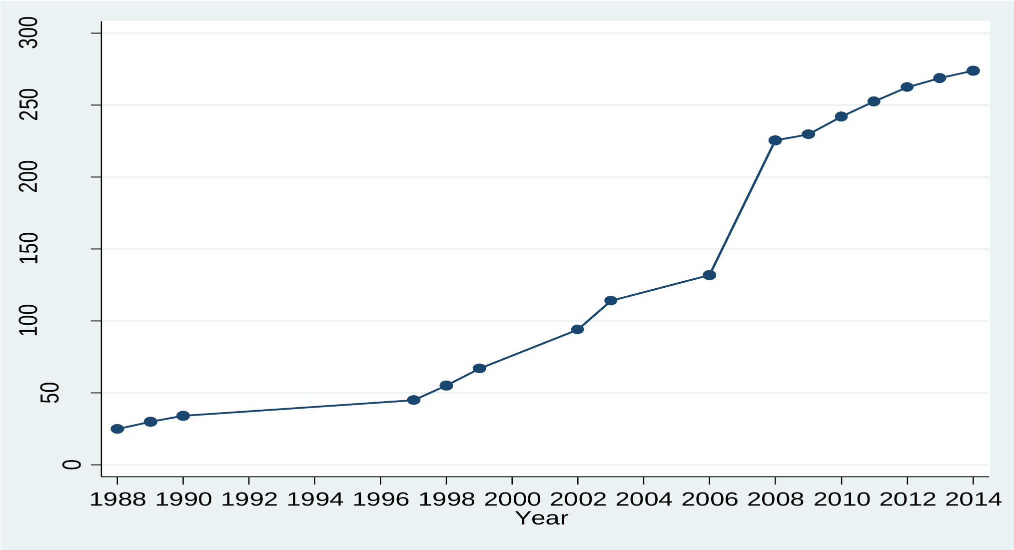
The quotations above are from three Chinese factory workers describing their life and expectations in their urban area. The latest official figures from the National Bureau of Statistics of the People's Republic of China released in April 2015 estimate the total number of rural migrant workers to be 273.95 million in 2014, which accounts for nearly one fifth of the total population in the country. We have never seen such a large-scale internal migration in history. Figure 3 depicts the significant increasing trend of the number of rural migrants since 1988. According to Meng and Zhang (2001), in

[60] http://www.worldbank.org/en/country/china/overview

[61] Ngai (2005) .

1988, about 25 million migrants worked in the urban area. This figure rose to 67 million and 132 million in 1999 and 2006 respectively. It then expanded greatly to 225 million in 2008. Although from 2009 to 2014, the growth rate of migrant workers has decreased, the volume of rural migrant workers is ten times larger than the scale of migrant workers in 1988. It is estimated that more than 300 million rural migrant workers may move to cities in the next few decades (Meng, 2012). According to *the National New-type Urbanization Plan (2014-2020),* the government will help 100 million migrant workers to become permanent urban citizens[62].

Figure 3: Total number of rural migrants in China



* Source: Year 1988 (Meng and Zhang, 2001); Year 1990 (Magnani and Zhu, 2012); Year 1989 and 2006 (Zhu, 2016); Year 1997, 1998 and 1999 (Ping and Pieke, 2003); Year 2002 and 2003 (Zhan, 2005) and Year 2008 to 2014 (National Bureau of Statistics, China).

A significant characteristic of rural to urban migration in China has emerged in recent years. According to the China Rural Migrant Workers Monitoring Report 2009 from the National Bureau of Statistics of People's Republic of China, about 62% of migrant workers were born after 1980. The term "new generation of migrant workers", was first introduced by the Chinese government No.1 Document of 2010, an official document to address government priorities each year, to describe this special and important group of migrant workers (Cao and Lin, 2010). Due to the fact that the one-child policy was strictly enforced in urban China, the main part of the labour force in the future will come from rural China. As the old generation migrant workers return

[62] http://news.xinhuanet.com/english/china/2014-03/16/c_133190495.htm

home to the rural area for retirement, this post-1980 group is replacing the "old" migrant group to be the main part of the rural migrant labour force to facilitate the urbanisation and the development of the economy in China.

Compared with the old generation migrant workers, "New generation" migrants are relatively young, better educated, have a lack of agricultural experience and have higher expectations about career and social mobility (Liu et al., 2012). Their occupational choices, employment patterns and attitudes towards working and living conditions are different from their predecessors (Wang et al., 2013); (Cheng et al., 2014b). In the old generation, earning money in the urban area was the main aim and then they usually chose to return to the countryside, whereas, it is argued that new generation migrants intend to settle down in cities permanently (Liu et al., 2012). Furthermore, the new generation is more aware of their own rights and freedom, and place more emphasis on their identity and status in the city. The heterogeneity of migrant groups has been addressed by a strand of literature (Cheng, 2014); (Zhu and Lin, 2014); (Liang, 2015); (Liu et al., 2012); (Cheng et al., 2014b). However, little evidence focuses on exploring the differences in wage returns to education, and educational mismatch between these two generations of migrant workers.

Education is an important engine to accelerate the development of economic growth. According to Human Capital Theory (HCT), individuals' real productivity is closely connected with the level of education and thus education can lead to income inequality among individuals (Schultz, 1961). It is well acknowledged that there is a huge disparity of income between rural-to-urban migrant workers and urban residents (Démurger et al., 2009); (Meng and Zhang, 2001). Moreover, both the educational level and quality of schooling is quite low in rural China compared to urban China (Heckman, 2005); (Fu and Ren, 2010). Therefore, a comparative study of the wage effects of schooling between rural-to-urban migrant workers and urban residents can help rural-to-urban migrant workers better integrate into the urban society and accelerate urbanization in China. Examining wage returns to schooling of migrant workers by generations can be used to see whether new generation migrant workers overcome the education and earnings disadvantages of the old generation in order to provide a high quality labour force to support the economic development and urbanisation in China. In addition, exploring the education-job match of migrant workers plays an important role to guide new generation of migrant workers to form a rational career plan to achieve their potential and improve their productivity.

Therefore, four issues are explored in this chapter to answer the research questions presented in chapter 1 (page 8). These issues are as follows:

(1) To investigate whether there is any difference in the wage return to education between the new and old generation migrant workers.

(2) To examine the level of educational mismatch among rural-to-urban migrant workers.

(3) To examine the wage effects of educational mismatch between the two generations.

(4) To undertake a comparative study of the issue of educational mismatch between rural-to-urban migrant workers and urban residents.

To address the above objectives, a large scale dataset, the Rural-Urban Migrant Survey in China (RUMiC) 2009 is employed in this chapter. Empirical results in this chapter are based on OLS regression, i.e. at the mean, and Quantile Regression (QR). Specifically, we explore the heterogeneous wage return to schooling and wage effects of educational mismatch across the wage distribution, which enables us to provide a wide picture of education and educational mismatch among migrant workers.

This chapter contributes to the existing literature on the education of migrant workers by taking the generation of migrant workers into consideration, i.e. we distinguish between the old and new generation of migrant workers. Moreover, this chapter is the first to extend the overeducation literature in China by analysis of the educational mismatch between old and new generation migrant workers, and between rural-to-urban migrant workers and urban residents in China.

The remainder of the chapter is organised as follows: the relevant background is presented in Section 4.2. Section 4.3 provides a comprehensive literature review regarding wage returns to schooling and the wage effects of educational mismatch. In section 4.4 and 4.5, an introduction to the data and econometric models are presented. Section 4.6 presents the empirical results. Finally, a discussion is presented in section 4.7 and the conclusion is presented in section 4.8.

4.2 Background

4.2.1 Rural-to-urban migration

From 1949 to 1978

Before the foundation of People's Republic in 1949, China suffered a series of imperialist invasions from Japan from 1937 to 1945 and the Civil War between the Communist and the Nationalist Parties between 1946 and 1949. Continuous war made China a nation full of poverty and devastation (Wu and Yao, 2003). Thus after 1949, reconstructing China and helping its population to overcome hunger and poverty was the most urgent task of the Communist Party (Wu and Yao, 2003). In 1952, developing capital-intensive heavy industries in order to catch up with the advanced countries, like the USA and the UK, was set as the main development strategy of the Chinese government. For the purpose of satisfying the needs of operating heavy industries, the government encouraged peasants to work in the urban area to support the development of urban construction. Moreover, the implementation of a radical programme of collectivisation forced an increasing number of people to leave the land after 1953. About 40 million rural labourers worked in the urban industrial sectors during 1950 to 1958 (Ping and Pieke, 2003). However, the development of heavy industries couldn't absorb the large volume of the rural-to-urban labour force. In order to restrict the flow of rural-to-urban migrants, the status of free mobility of labour in China was changed in the late 1950s with the introduction of the nationwide household registration system, the *Hukou*. The Chinese government issued *Regulations of Hukou Registration* in January 1958, which strictly divided the whole Chinese population into two parts, agricultural and non-agricultural. The Household Registration System requires each individual to register with their local authority to gain a residency permit according to the place they live. Consumer foods, education, jobs and social benefits are allocated based on the Household Registration System. Another policy closely associated with the Household Registration System is the food rationing system, which restricts people to buy food by giving coupons only in the residence area. Therefore, it is very hard for an individual with rural registration to live in the city. Working in the urban area is a dream for ordinary rural people. Meanwhile, converting *Hukou* status is strictly controlled by the state. Only three channels for rural people to transfer Hukou status are allowed: (1) family reasons[63]; (2) higher education or joining the army; (3) official channels, like state-initiated programmes. However, these paths are extremely difficult to obtain and to be guaranteed. Therefore, before the reform started in 1978, the *Hukou* system was employed by the government to control the mobility of labour. Based on figures from Zhao (2000) , the net migration rate in China from 1949 to 1985 was 0.24 percent[64], which provides evidence that the *Hukou* system was effective in controlling labour mobility in China[65].

From 1978 to 2001

By the late 1970s, the Chinese government realised that the centrally-planned economic system, which had led to low productivity, insufficient resource allocation and a lack of innovation, was not a suitable system for the economic development of China (Brandt and Rawski, 2008). The agricultural sector first witnessed the market-oriented economic reform. The Household Contract Responsibility System (HRS) was introduced to the rural area in 1979. Under the Household Contract Responsibility System, farmland was returned to rural peasants under long-term leases and agricultural procurement prices were increased by 25%, which could increase peasants' incentives to engage in agriculture (Seeborg et al., 2000). Every household was now rewarded on household productivity rather than production team (village level) and thus the rural income and farm productivity witnessed a large increase[66]. According to Lin (1992), from 1978 to 1984, approximately 48.64% of the total agricultural output growth was contributed by the Household Contract Responsibility System (HRS). The increase in rural productivity ensured the adequate supply of food in the urban market and it was also an important consideration in the government decision to abolish food rationing (Zhao, 2004). In addition, this reform created surplus labour in rural households and the opportunity cost of migration also decreased, which increased the incentive for rural people to migrate to the city.

From 1979 to 1983, the movement from rural to urban areas was still prohibited by the

[63] Family reasons include migration with family, marriage (mainly for rural women) and being adopted by relatives without children (Zhao, 2000).
[64] The world average migration rate is 1.84 per cent from 1950 to 1990 (Zhao, 2000).
[65] There are two large urban-to-rural labour movements during the Great Leap Forward (1959-1961) and the Cultural Revolution (1966-1976), which are beyond the scope of this chapter.
[66] Before the economic reform in 1978, earnings of rural households was determined and allocated by production teams and brigades (Brandt and Rawski, 2008).

government (Ping and Pieke, 2003). However, with the deepening of the economic reform, more rural labour surged into the urban labour market, challenging the *Hukou* regulation. In order to make adjustment of the increasing rural to urban movement, the government began to relax the restrictions on rural-to-urban labour mobility. A series of policies targeted towards migrants were issued.

- In 1984, the government allowed migrants to work in urban enterprises and operate their business as "food-self-sufficient households" without the supply of subsidized food and other benefits available for urban residents from the government.
- In 1985, temporary resident permits to migrants for economic reasons were allowed by the government.
- In 1986, rural labourers could apply for jobs in state-owned enterprises.
- In 1988, national identity cards were issued as a proof of identity of migrant workers making the temporary registration in urban areas easier than before (Brandt and Rawski, 2008). The term "Temporary" means that migrants only got temporary access to the urban area without changing the *Hukou* status. This group of migrants is also called the "floating population".

During the Chinese New Year period in 1989, a large number of rural migrants surged into cities, which has been described as the "rural migrant wave" (Zhao, 2004). In order to cope with this new social-economic phenomenon in cities, the government introduced a number of policies to halt the speed of migration from 1989 to 1991[67].

Following Mr. Deng Xiaoping's tour of southern coastal China in 1992, the development of special economic zones in coastal areas and the shift of development strategy from capital-intensive industries to labour-intensive industries created demand for cheap and temporary rural migrant labour in the urban area. Although some major cities made efforts to restrict migration in order to relieve the unemployment problem caused by the reconstruction of state-owned enterprises in urban areas since 1994, in all, the government mainly focused on the encouragement of rural-urban migration from 1992 to 2000 to some extent (Zhao, 2004).

[67] Detailed policies can be seen from the summary of Ping and Pieke (2003) .

After 2001

After joining the World Trade Organisation (WTO) in November 2001, the labour-intensive and export-oriented economy in China created enormous demand for low-skilled and low-cost labour. Therefore, the rural to urban flow of migrant workers kept rising. The central government issued many policies to promote the mobility of rural-urban migration and made adjustments to the Hukou system accordingly. This large scale rural to urban migration has become a significant phenomenon in China and provides a very important driving force of China's extraordinary economic growth (Meng, 2012). Most of the existing studies focusing on the rural-to-urban migration in China only cover the relevant background until the joining of WTO. However, since 2001, a series of policies have been issued that may influence the trend and characteristics of rural migrant workers.

- In 2003, agricultural taxes had been eliminated by the Chinese government, which increased the profit of farming (Liang et al., 2014).
- In January 2008, protecting migrant workers' rights regarding labour contract, social insurance and fair wages was covered in the new Labour Law issued by the National People's Congress (NPC). Findings from Li and Freeman (2015) indicate that the labour cost of migrant workers increased after the application of the new labour law. Factories also increased the requirement of labour skills of migrant workers (Frijters et al., 2010).
- Influenced by weak demand of the international economy due to the financial crisis since 2008, the Chinese government shifted the development strategy to focus on the development of middle and western China. The Ministry of Human Resources and Social Security (MHRSS) set "*The Spring Wind Action Program*" in 2008 to encourage rural workers to work in inland provinces rather than coastal provinces and provide financial support to help them take retraining programmes to improve their skill levels (Wang et al., 2013).
- In order to relieve the high population pressure presented in large cities like Beijing, Shanghai and many coastal cities, the Chinese government changed its urbanisation policy to guide rural migrants to work in small and medium cities and townships. This trend was a very important policy-concern in the next decade (Cao and Lin, 2010).
- The Chinese government issued *the National New-type Urbanization Plan*

(2014-2020), which aims to increase its urbanization level to reach 60% by 2020. The central government released a series of policies to help migrant workers become permanent residents in the urban area and enjoy more public services in the urban area[68].

4.2.2 Spatial patterns of rural-to-urban migration

The different level of economic development and regional disparity in China can be classified into three broad regions: the eastern region, the central region and the western regions, which can also be called "three economic belts" (Fan, 1995). From 1949 to 1978, the direction of migration was from the eastern region to the middle and western regions so as to support the economic development of inland provinces emphasised by the government. However, the failure of a balanced development strategy since 1949 urged the government to change to a coastal-dominated development strategy after 1978. The implementation of economic reform and open door policy has a clear spatial pattern. These policies had been carried out first in the coastal regions (special economic zones (1979), open coastal cities (1984), open economic areas (1985) and Pudong New District (1990)). Then, they were expanded to all the other parts of China. Therefore, the economic growth has a time-region pattern accordingly. The Pearl River Delta (Guangdong) witnessed a rapid economic growth in the 1980s and followed by the Yangtze River Delta (Shanghai, Jiangsu and Zhejiang) in the 1990s. It then spread to north China in the 21st century (Beijing, Tianjin and Tangshan). All of the above areas are classified into the eastern region. Earning money is a key objective of migrant workers. Following this spatial disparity of economic growth, most migration was from the western region to the middle region and the eastern region. According to the 2000 and 2010 Population Census of the People's Republic, although about two thirds of total migrant workers accumulated in the eastern region and this ratio is similar between 2000 and 2010, the central and western China have witnessed the largest increase of intra-provincial migration (Liang et al., 2014).

4.2.3 Motivations and Reasons for migration

The most famous theory in the rural-urban migration literature is put forward by

[68] http://news.xinhuanet.com/english/china/2014-03/16/c_133190495.htm .

Todaro (1969), which was further developed by Harris and Todaro (1970). In this theory, the decision to move is determined by the rural-urban wage gap regarding the expected wage rather than absolute wage. If rural people's expected wage in the destination area is higher than their real wages in the rural area, they will move. Otherwise, they will stay in the rural area. In China, the most significant and key motivation of the rural to urban migration is money, that is the rural-urban income inequality, which is also a common feature in many other developing countries (Shorrocks and Wan, 2005). The income disparity between rural and urban areas in China is caused and intensified by the household registration system (Hukou). Obvious urban-rural income disparity in China has been investigated by many scholars. According to Sicular et al. (2007), the urban-rural income ratio in China was 3.11 in 1995 and 3.18 in 2002, which is much higher than that in other Asian countries (between 1.3 and 1.8) in 1990s (Eastwood and Lipton, 2004). Wang et al. (2014) explore the urban-rural income ratio in China from 1979 to 2009. Although the urban-rural ratio decreased from 1978 to 1985, an increasing trend can be observed from 1985 (1.9:1) to 2009 (3.3:1). In addition, regional income disparity is another important factor driving people to migrate to urban areas caused by the economic development since 1978. Rural migrant workers choose to migrate from poor rural regions to high income regions. Apart from the above reasons, the relaxation of government policies towards the household registration system, the poverty reduction policies of local government and the slowdown in the development of TVEs (Township and Village Enterprises) to absorb surplus rural labour all contribute to migration from rural to urban areas (Ping and Pieke, 2003). Summing up, loosened government policy, increasing labour demand from urban enterprises and huge wage differentials between urban and rural area attract more rural people to migrate to cities.

4.2.4 Socio-demographic characteristics of migrants

Most rural migrant workers are young and single adults seeking jobs in the urban area. Even if some married rural migrant workers come to the cities, they tend to leave their spouse and children behind in the villages. The distribution of gender varies with regions, industries and occupations. For instance, males are more likely to be employed as construction workers and female migrant workers usually work in the household services sectors (Seeborg et al., 2000). Based on the China Rural Migrant Workers Monitoring Report 2009 from the National Bureau of Statistics of People's

Republic of China, 65.1% of migrant workers are males and the proportion of female migrant workers is 34.9%. About 62% of migrant workers are 30 years old and below. Junior middle school is the main highest education level (64.8%). Half of the rural migrant workers have never received any skill training. Moreover, migrant workers with lower educational levels are less likely to receive skill training.

4.2.5 Education of rural-to-urban migrant workers

Although the educational level of rural-to-urban migrant workers is higher than their counterparts staying in the rural area, the average education level of rural-to-urban migrant workers is only junior middle school or primary school. Most of them don't acquire skill training. According to Lu and Song (2006), about 73.6% of migrant workers have junior middle school or primary school. Only 12.5% of them graduated from vocational school. In the analysis from Deng and Li (2010), only 3.9% of migrant workers have a tertiary degree while around 44% of urban residents have a tertiary degree. In addition, the quality of rural compulsory education is low (Heckman, 2005). Most rural-to-urban migrant workers receive education in the rural area. Because of the strong preference of allocating government funds and educational resources to the urban area by the government, three-year junior school and college or universities are mainly located in the urban area, while only junior middle schools or primary school are located in the rural area (Fu and Ren, 2010). In addition, the central government regulates that the county and township government have the responsibility to finance rural compulsory education. Due to the limited ability of the local government to finance rural compulsory education, the basic operational expense of schooling, such as, funding for teaching equipment, salary of teachers, is hard to guarantee in some rural areas. According to Fu and Ren (2010), only 20.3% of rural primary teachers have a specialised secondary education degree, while in the urban area, nearly half of the primary school teachers have at least this degree level.

Realising the significant educational disparity between urban and rural areas, the Chinese government has implemented a series of policies to enhance the rural education. In 1986, the *Compulsory Education Law of the People's Republic of China* was issued by the National People's Congress to set the nine-year compulsory education system (six-year primary school and three-year junior middle school), which can increase the average educational attainment level in rural area. In 1999, the State

Council issued *Decisions on Deepening the Educational Reform and Improving Quality-oriented Education* to promote the quality of rural China and in the same year, the Ministry of Education approved *The Action Plan to Revitalise education towards the 21st Century* to address the importance of enhancing the educational quality in rural area. Increased educational attainment and improved educational quality in rural China has been confirmed by researchers (Hannum and Park, 2002); (De Brauw and Giles, 2008); (Wang and Zhao, 2011).

4.2.6 Labour market of rural-to-urban migrant workers

Although migrant workers and urban residents in China speak the same language, own the same skin colour and share identical cultural background, the household registration system acts as an "internal passport" that splits the urban labour market into two segments, which is comparable to the labour market encountered by immigrants and natives workers. Rural-to-urban migrant workers are not only looked down on by their urban counterparts, but also encounter official discrimination. Thus, workers with rural registration mainly undertake low status and low-paying jobs or 3D jobs (dirty, dangerous and demanding) in the urban area, while those higher-ranked jobs that are typically impossible for rural people to take are always undertaken by urban residents with non-agricultural hukou. Many cities have also imposed restrictions on the occupation categories that migrant workers can take. For instance, Beijing restricts 200 particular job categories that migrant workers can take. Most of them are the lowest and dirtiest blue-collar jobs (Kwong, 2006). Moreover, rural hukou holders are often denied many of the basic benefits enjoyed by urban hukou holders, such as, unemployment insurance, minimum living wages, subsidized housing, medical care and schooling for their children. When they came to the cities, most of them worked in the manufacturing, construction and service industries. They typically work longer hours, are rewarded with lower wages and have very low job security compared to urban residents. Moreover, they live in poor housing conditions and have poor health (Wong et al., 2007). Many scholars treat rural-to-urban migrant workers as the marginalised groups in cities or second-class workers in the urban labour market (Wong et al., 2007); (Démurger et al., 2009).

4.3 Literature Review

4.3.1 Theoretical foundation of Mincer equation

It is well recognised in the economics of education literature that education can have an important effect on individuals' wages. In real life, if comparing two groups of individuals of the same age and gender, the group with the higher educational level has higher average wages. Schultz (1961) argues that earning differentials are reflected by the difference in education. The positive relationship between education and earnings is due to the fact that productivity can be enhanced by education (Becker, 1962). Based on this fact, those who have higher education can contribute more to productivity and thus they would be rewarded by higher earnings (Schultz, 1961).

Mincer (1974) is the first scholar to develop an empirical model to explore the relationship between earnings and human capital, which is specified as follows:

$$\ln Y_i = \alpha_0 + \alpha S_i + \gamma_1 X_i + \gamma_2 X_i^2 + \mu_i \qquad (1)$$

where X_i is years of working experience. γ_1 and γ_2 should be positive and negative respectively. α is the estimation of the return rate to schooling and is assumed to be constant in different educational levels. μ_i is a residual with zero mean and a normal distribution. The above equation, which is also called Mincer earning equation, is a cornerstone of the empirical research to estimate the wage return to schooling. It has been commonly used by data from a number of countries over different time periods and individuals to discover the intrinsic quality of wage differentials.

Considering the life-cycle theory and the relationship between earnings and human capital investment including schooling and post school investment, Mincer (1974) assumes that potential earnings at time *t* is decided by the investment made in previous period *t-1*. Suppose W_t is the potential earnings in time t. Post school training cost is assumed to account for a fraction of earnings in previous period, i.e. $I_{t-1} = k_{t-1}W_{t-1}$. Then

$$W_t = W_{t-1} + \beta_{t-1}I_{t-1} = (1+\beta_{t-1}k_{t-1})W_{t-1} \qquad (2)$$

where β_{t-1} is the return to post-school investment made by time $t-1$. After repeated substitution,

$$W_t = \prod_{i=0}^{t-1}(1+\beta_i k_i)W_0 \tag{3}$$

Investment in one year of schooling can be treated as one year's forgone earning and thus k_{t-1}=1. Assume that the return to years of schooling is constant in different educational levels and the investment in schooling commences at the beginning of life. At the same time, post school investment is also assumed to be constant over time and is equal to β_0. Then we can get:

$$\ln W_t = \ln W_0 + S\ln(1+\alpha_S) + \sum_{i=s}^{t-1}\ln(1+\beta_0 k_i) \tag{4}$$

It also can be written approximately as follows:

$$\ln W_t \approx \ln W_0 + S\alpha_S + \beta_0 \sum_{i=s}^{t-1} k_i \tag{5}$$

In addition, Mincer (1974) also made the assumption that the post-school investment is decreasing with time, i.e.

$$k_{s+\theta} = k(1-\frac{\theta}{T}) \tag{6}$$

Where θ is equal to t-s, which is the working experience at the time t and T represents the total working life. Based on above assumptions, we can write:

$$\begin{aligned}\ln W_{S+\theta} &\approx (\ln W_0 - k\beta_0) + S\alpha_S + (\beta_0 k + \frac{\beta_0 k}{2T})\theta - \frac{\beta_0 k}{2T}\theta^2 \\ &= \alpha_0 + \alpha S_i + \beta_1 X_i + \beta_2 X_i^2 + \mu_i \end{aligned} \tag{7}$$

Based on the above frameworks, we obtain the standard Mincer equation (Heckman et al., 2003).

4.3.2 Empirical application of Mincer equation in a global aspect

Psacharopoulos and Patrinos (2004) provide a comprehensive summary of studies of wage returns to schooling on a global scale, covering more than fifty years since the

1950s[69]. In this study, the average wage return to one year of schooling is 10 percent at the world level. In Sub-Saharan Africa and Latin America, wage returns to schooling are the highest, achieving more than 12 per cent. In Asia and the Middle East, the average wage return to education is between 7 to 10 per cent, which is lower than the world level. However, although the percentage of individuals receiving higher education in the OECD countries is the highest, the average return to education is only 7.5 percent. Psacharopoulos and Patrinos (2004) also suggest that the average wage return to schooling has decreased by 0.6 percent from the 1990s due to the worldwide education expansion.

4.3.3 Wage returns to schooling in urban China

Investigation of wage returns to education in China has many important implications. The wage return to schooling is always employed by scholars to analyse the structure of the labour market and to measure the process of economic transformation in China (Guifu and Hamori, 2009). Qian and Smyth (2008) argue that examining the wage effects of education enables us to improve the efficiency of resource allocation, which can provide incentives to private investment in education and offer guidance regarding the government expenditure on education. Moreover, distributional consequences caused by investment differentials on education can also be examined (Hannum and Park, 2007). Due to China's particular track of economic development, the wage return to schooling in China has unique patterns. Throughout the literature, the exploration of returns to education in China can be divided into five aspects: (1) over time; (2) data aspects; (3) by groups; (4) migrant workers; (5) methodology issues.

4.3.3.1 Wage returns to education over time

The first aspect, focuses on studies that capture the wage effects of education over time (these studies are presented in Table C 9 in the appendix). Zhou (2000) examines the change in the wage return to education between the pre-reform era and the reform era in China employing panel data from 20 cities in China in 1955, 1960, 1965, 1975, 1978, 1984, 1987, 1991, 1992, 1993 and 1994. The return to junior high school increases from insignificant before 1980 to 11 per cent in 1993. Fleisher and Wang (2005) use retrospective data collected in 1994 to explore the return to schooling in

[69] This study is a further update of previous versions of Psacharopoulos (1994) .

China from 1975 to 1990. The wage effects of education begin to increase gradually from 1975 at 1.37 per cent to 5.97 per cent in 1990. Appleton et al. (2005) suggest that there is an increasing trend in the wage return to schooling in China from 1988 adopting four cross sections (1988, 1995, 1999 and 2002) from the Urban Household Income Survey (UHIS)[70]. Zhang et al. (2005) find that the wage return to education increases from 4.0 per cent in 1988 to 10.2 per cent in 2001 based on data from the annual Urban Household Survey in China. Although the above studies can't be compared directly because they use different datasets and control variables, they all indicate an increasing trend of wage returns to education from the 1980s to 1990s and beyond[71]. The most significant explanation behind it is the economic reform and institutional changes in the labour market that occurred in China[72].

4.3.3.2 Wage returns to education: data aspects

Table C 10 in the appendix presents the literature about wage returns to education in China employing different datasets. The most adopted dataset in the analysis of wage returns to education is the Chinese Household Income Project (CHIP), which contains household survey data in 1988, 1995 and 2002. This project can be used to provide evidence of returns to education in different phases of economic reform after 1978 in China[73]. Knight and Song (1993) and Xie and Hannum (1996) use the first wave 1988 of the CHIP to explore the wage return to education in the first decade after the commencement of economic reform, and conclude that returns to education are in the range 3 to 4 per cent in the 1980s[74]. Using CHIP 1988 and 1995, Bishop and Chiou (2004) find that the wage return to one year of schooling increases from 2.8 per cent in 1988 to 5.6 per cent in 1995. Employing three waves of CHIP data (1988, 1995 and 2002), Fleisher et al. (2004) report that wage returns to education increased from 5.0 to 7.9 per cent.

The newly published datasets, Rural-Urban Migration in China (RUMiC) and the

[70] The returns to education for four years are 3.6 percent in 1988, 5.6 per cent in 1995, 6.7 per cent in 1999 and 7.5 per cent in 2002 respectively.

[71] Heckman and Li (2004) also confirm this after using a proxy for ability.

[72] Detailed background about the labour market reform in China is described in Chapter 2.

[73] The first wave of CHIP in 1988 represents for the early ten years in post-reform era. The 1995 wave can be used to estimate wage return to education as an indicator of the process of economic reform in the 1990s. The latest wave in 2002 provides an update of the previous existing literature on wage returns to education.

[74] Byron and Manaloto (1990) and Maurer-Fazio (1999) all find similar results.

China Health and Nutrition Survey (CHNS) are widely used by scholars to replace CHIP to measure the wage return to education in the 2000s. Guifu and Hamori (2009) estimate the wage return to education in China to be in the range of 7 to 8 per cent using the data from CHNS 2004 and 2006. Liu and Zhang (2008) use seven waves' data of CHNS (1991, 1993, 1997, 2000, 2004, 2006 and 2009) to estimate wage returns to education in urban China, which covers the latest period, the late 2000s. This study reports that wage returns increased over time from 2.46 per cent in 1991 to 7.10 per cent in 2009. However, the Rural-Urban Migration in China (RIMiC) is mainly focused on the exploration of rural migrants. Cui et al. (2013) estimate the wage return to education for migrant workers to be in the range of 3 to 5 per cent using the RUMiC 2008.

Although with the continuing development of economic reforms, a significant increasing trend of wage returns to schooling is presented in the existing literature, these estimated wage returns to education are less than 8 per cent, which are still lower than the average level of the world (10.1%) and Asian countries (9.6%) (Psacharopoulos, 1994).

4.3.3.3 Wage returns to education by groups

Some studies focus on the analysis of wage returns to education between different groups, which are shown in Table C 11 in the appendix. Gender differentials in wage return to education in China is confirmed by empirical evidence. Although the earnings of males are higher than females, the wage return to education is higher for females than males (Jamison and Van der Gaag, 1987); (Li, 2003). However contrary to these earlier findings, Maurer-Fazio and Dinh (2004) and Qian and Smyth (2008) report that the rate of return to education is higher for males than females.

Some scholars explore the wage return to different age cohorts. In the Maurer-Fazio (1999) study, for people who are younger than 30 years old, the return to schooling is 6.4 per cent for males and 6.8 per cent for females, which is similar to existing studies focusing on Hong Kong and Taiwan[75]. Maurer-Fazio (1999) argues that younger workers benefit more from the labour market reform than their elders. Similarly, Qian

[75] According to Psacharopoulos (1994), the return to schooling is 6.1 per cent and 6 per cent in Hong Kong and Taiwan respectively.

and Smyth (2008) report that the wage return to education for people who are aged 35 or below is 17.16 per cent, which yields a higher figure than the existing studies in China[76]. However, Li (2003) separates people into three groups due to the time they enter the labour market. For those who began to work before the economic transition (before 1979), the wage return to education is 4.7 per cent. The estimated wage return to schooling for those who enter the labour market in the early stage of urban reform (1980 to 1987) is 7.3 per cent; and the last cohort (1988-1995) has 6.5 per cent wage return to education. The new wage regime is easier to apply to the new entrants in the labour market than old workers, therefore we can see higher returns to schooling for individuals who enter the labour market after 1979.

4.3.3.4 Wage returns to schooling of migrant workers

Due to the previous lack of data collection, only a few datasets are now available for the investigation of the wage return to schooling among rural-to-urban migrant workers (Démurger et al., 2009). Similar to the wage return to schooling in rural China, the return rate to education is also quite low among migrant groups, which can be seen from Table C 12 in the appendix. Maurer-Fazio and Dinh (2004) indicate that the return rate to education is only 1.5 percent for the whole migrant sample in the Urban Labour Market Integration Project (ULMIP) in China 1999-2000. Cui et al. (2013) employ three datasets, the 1995 and 2002 waves of the China Household Income Project (CHIP) and the 2008 Rural-Urban Migration in China (RUMiC) to investigate the wage return to education among migrant groups over time. Their results show that the return to education in the migrant groups did not change much between 1995 and 2008, 3 percent and 5 percent respectively. However, if focusing on subsamples of migrant workers, female migrants have a higher return rate (4.9 percent) than the whole migrant sample (Maurer-Fazio and Dinh, 2004). Moreover, migrants with a mean educational level higher than 9 years of schooling have a 6.4 percent return rate to education.

Most of the existing studies focus on the comparison between urban residents and migrant workers to explore the wage return to education for migrant workers. Zhao and Qu (2013) estimate that the wage return to education of migrant workers increased

[76] Qian and Smyth (2008) suggest using the group of people who are age 35 and below to capture the effects of education reform and labour market reform on the return to education in China.

from being statistically insignificant in 2002 to 1.3 percent in 2007, while the wage return to urban residents decreased from 3.2 per cent to 1.6 percent from 2002 to 2007, which indicates a convergence in the wage return to education between urban residents and migrant workers. Démurger et al. (2009) find that the disparity of wage returns to education between urban residents and migrant workers is larger in the private sector than in the public sector. After adopting the standard Heckman selection procedure and using individual's parents schooling as proxy of individual ability, De Brauw and Rozelle (2007) argue that the return to education of migrant workers is higher than local wage earners, which are 8.3 percent and 5.2 percent respectively. Especially, when restricting the sample to migrants who are 35 years old and under, the return rate to schooling rises to 11.7 percent. Employing a set of instruments[77], wage returns to education for male migrant workers increase to about 8-8.5 percent compared to the OLS estimation (4.5 per cent) (Sakellariou and Fang, 2016).

4.3.3.5 Wage returns to schooling: methodology issues

Apart from the institutional changes that can explain the low wage return to education in China, employing the ordinary least squares method to estimate the Mincer equation is another very important reason (Li and Luo, 2004)[78]. OLS methodology is criticised by the problems of omitted ability and measurement errors. Individuals' earning differentials could also be explained by ability differentials associated with their educational level. In this case, the OLS approach may overestimate the wage return to schooling. Additionally, the measurement error of years of schooling may cause attenuation bias, which may underestimate the wage return to education (Li and Luo, 2004).

According to Card (1999), three approaches can be used to cope with the issue of omission of ability in the analysis: the instrumental variable (IV), the fixed effect method and finding a variable to measure ability directly. Heckman and Li (2004) provide a detailed discussion about the advantages and disadvantages of the three methods. Recent studies in China show that IV estimation indeed yields a higher

[77] Instruments contain individual's birth order information, age of school entry and spouse's education.
[78] However, adopting the OLS approach to examine the wage effects of education is a common feature in the study of China (Jamison and Van der Gaag, 1987); (Zhao, 1997); (Gustafsson and Li, 2000); (Yang, 2005); (Qian and Smyth, 2008).

estimated return to education than OLS approach (Li and Luo, 2004); (Heckman and Li, 2004); (Guifu and Hamori, 2009). Most datasets don't contain variables to measure ability directly. Finding a proxy variable for ability as a regressor in the regression is seldom used by scholars. Only Frijters et al. (2010) use university entry scores to capture ability to estimate the wage return to education for urban workers and migrant workers in China using the 2008 Rural-Urban Migrant Survey[79].

4.3.3.6 Wage returns to schooling: quantile regression

The investigation of wage returns to education using OLS methodology only reflects the effects from the mean of the conditional distribution of earnings. However, the effects might vary across the wage distribution. Quantile Regression (QR) provides a way to solve this problem. It describes the education effects on earnings at different quantiles of the earnings distribution.

Buchinsky (1994) argues that the OLS method fails to describe some important features of the wage structure. He finds that the wage return to education increases across quantiles in the U.S. labour market in the 1960s. Employing the Family Expenditure Survey (FES) 1980, 1985, 1990 and 1995 in the UK, Harmon et al. (2003) provide strong evidence that the wage return to schooling is higher at the top decile of wage distribution than the bottom decile of the wage distribution. Through the investigation of 16 developed countries[80], Martins and Pereira (2004) suggest that the return to education is greater for higher skilled workers after controlling for other factors[81]. Increasing wage returns to schooling along the wage distribution is also confirmed in many transition countries, such as Bulgaria and Kazakhstan (Staneva et al., 2010). However, the wage return to education is higher in the lower half of the deciles (below the median) and lower in the upper half of deciles in South Africa (Mwabu and Schultz, 1996).

In China, findings of the wage return to education using quantile regression are mixed. Table C 13 in the appendix depicts the relevant literature using quantile regression to

[79] However, the authors don't provide detailed figure of wage returns to education in this study.
[80] These countries include Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK and USA.
[81] Martins and Pereira (2004) argue that overeducation, an interaction between schooling and ability, school quality or fields of study can be the possible explanations.

explore returns to schooling in China. Knight and Song (2003) suggest that returns to each educational level decrease along the wage distribution using two national household surveys in 1988 and 1995 in urban China[82]. In Messinis (2013)'s study, return to high education varies little as we move along the conditional distribution of wages for all full time workers[83]. However, when analysing urban workers and migrant workers separately, the return to high education increases with percentiles in the migrant sample while the return to high school decreases when moving up the distribution for urban workers. Employing the RUMiC 2008, Cui et al. (2013) find that returns to schooling were 3 per cent at the 10th quantile and 6 per cent at the 90th percentile for migrant workers in 2008. Although there is small wage differentials along the wage distribution, the average 4 per cent wage return to schooling of migrants is only part of the picture when analysing the wage return to schooling of migrant workers. In addition, the increasing wage returns to schooling along the wage distribution for migrant workers is also found in Zhu (2016).

4.3.4 Wage returns to education in rural China

Due to the existence of the Household Registration System and the Household Production Responsibility System, rural and urban labour markets have been isolated for about 40 years (Meng and Zhang, 2001). Under this separated labour market, overall inequality has increased over time, especially income inequality (Sicular et al., 2007). Due to different levels of development in the urban and rural labour markets, many scholars suggest analyzing these two areas separately (Johnson and Chow, 1997); (Zhao, 1997). However, due to the data limitations, most studies only focus on the urban labour market. Only a few studies analyse the wage return to education in rural areas (Liu and Zhang, 2008). The summary of literature is presented in Table C 14 in the appendix.

It is not surprising that the wage return to schooling in rural China is lower than in urban China and the rest of the world (De Brauw and Rozelle, 2008). Parish et al. (1995) and Johnson and Chow (1997) examine the wage return to education in rural areas and find returns to education are 1.8 per cent and 4.02 percent respectively using

[82] Substitution between education and ability and the ability to pay of employers are two possible reasons.
[83] High education refers to senior school or higher in this study.

two large-scale national datasets. Zhao (1999) estimates that wage returns to schooling in rural China are 1.2 per cent based on the data from Sichuan province. Liu and Zhang (2008) find that the wage returns to education for urban workers are 2.8 percentage points on average higher than rural workers from 1975 to 2009. In addition, using data from the rural industry sector[84], Meng (1996) and Gregory and Meng (1995) all find the wage return to schooling is around 1 per cent[85]. However, after controlling for sample selection, De Brauw and Rozelle (2008) find the mean wage return to one year of schooling is between 6.3 and 6.5 per cent, which is still lower than the world average. The low wage return to education should not be a primary reason to reduce the investment in rural education. Instead, we should place emphasis on the positive role of education in helping rural people obtain off-farm work (Parish et al., 1995).

4.3.5 Heterogeneity of the rural-to-urban migrant workers

Recently, a strand of literature has begun to focus on the heterogeneity of migrants groups. The term "new generation of migrant workers", first appeared in the Chinese government No.1 Document of 2010 (Cao and Lin, 2010). New generation of migrant workers refers to those who were born after the 1980s with agricultural registration, and then went to urban labour market in 1990s and afterwards. Comparably, the old generation migrant workers are those who were born before 1980 with agricultural registration. "Born in and after 1980", this generational division of rural to urban migrants in China is widely used in the literature to explore the heterogeneity of these two generations (Liu et al., 2012); (Cheng, 2014); (Liang, 2015);(Cheng et al., 2014b); (Zhu and Lin, 2014)[86].

There are mainly three arguments for this generational division. The first one is derived from adult development, which states that the younger and older generations have different behaviours and attitudes (Levinson, 1986). The second is the theory of market transition (Nee, 1989). Transforming from a centrally-planned economy to a market-oriented economy produced a massive influence on people's life in China. With tremendous economic and social development in China, migrants who were born

[84] It includes township, village and privately owned enterprises (TVP).
[85] See Table C14 in the appendix.
[86] National Population and Family Planning Commission of China (NPFPC) Report on China's migrant Population development 2010 is another official report exploring the new generation of migrant workers.

in the centrally-planned economy and those who were born in the reform period are different in terms of their objectives, preferences and behaviours. The third argument is the application of the '*one child*' policy adopted in China since 1980 (Wang, 2008) [87]. Based on this policy, those born after 1980 have no or fewer siblings than those who were born before 1980. The differences in the number of children in one family can affect the allocation of investment in education within one family and at the same time children's personality, psychopathology, and cognition also will be influenced (Plomin and Daniels, 1987); (Rosenzweig and Zhang, 2009). The above three viewpoints all support the argument that the old and new generations are not homogeneous and they should be treated differently if exploring groups of migrants. However, there are some different arguments that the 1970s is a transitional period and thus there should be a different generational division line of migrant workers. Yue et al. (2010) employ the transitional period (from 1970 to 1980) between the two generations as eleven possible dividing lines instead of only one (1980) to divide migrants. Those who were born after the dividing line are defined as the new generation, and respondents who were born before the dividing line are referred to as the first generation[88].

The generational division of migrant workers is a relatively new concept in the literature, thus the attention from scholars is not apparent. Wang (2008) provides a comprehensive study of the differences between two generations. He argues that the new generation of migrant workers is more educated than the old generation. The intention of migrating to urban cities in the old generation is more concerned about earning high wage returns to labour to support family. Conversely, the new generation of migrant workers treats migration as a pathway to pursue their career plan in order to have long term development and learn skills. In addition, the new generation has lower wages than the old generation and also works longer hours (Wang, 2008).

Wang et al. (2013) report that the new generation have higher job satisfaction than the old generation. Moreover, the new generation has more insurance at work, receives

[87] One child policy was introduced by the government in 1979 to reduce family size that each family is allowed to have only one child. Detailed introduction of one child policy can be seen from Hesketh et al. (2005).

[88] In this study, we refer to Year 1980 to divide two generations as Liu et al. (2012), Wang et al. (2013) and Cheng et al. (2014b).

significantly more on the job training, conducts less dangerous or toxic work, and receives more regular health checks than the old generation.

In terms of social networks, Liu et al. (2012) show that the new generation migrant workers are more likely to integrate into the host cities and they are more flexible and have greater ability in obtaining mobility resources than the old generation migrant workers. According to Liang (2015), the interpersonal trust of the new generation is expanded to a more social extent, like the acceptance of surroundings and different level of trust in others, while the old generation rely more on family, relatives and neighbors.

4.3.6 Educational mismatch in the labour market of migrants

It is well acknowledged that the issue of overeducation and undereducation has been of concern for a number of years since Freeman firstly put forward the notion of overeducation in 1976. The relevant concept and empirical evidence have been explicitly discussed in Chapter 2 and Chapter 3. However, the research of educational mismatch regarding immigrants is still limited.

4.3.6.1 Incidence of overeducation and undereducation among immigrants

There is a stylised fact in the literature of educational mismatch of immigrants that immigrants are more likely to be overeducated than their native counterparts and undereducation is more prevalent among immigrants. Nielsen (2007) finds that the incidence of overeducation of foreign-educated immigrants is 39 per cent and the incidence of overeducation of native Danes is only 20 per cent. Compared to the native males, the incidence of overeducation of recent male migrants is 14.6 per cent higher and the incidence of overeducation of earlier male migrants is 4 per cent higher in New Zealand (Poot and Stillman, 2010). Tijdens and van Klaveren (2011) explore the educational mismatch regarding natives and migrant workers in 13 European countries. The higher incidence of overeducation of immigrants relative to their native workers is found in Belgium, Denmark, Finland, France, Netherland, the United Kingdom and Sweden. However, in the United States, native males have a higher incidence of overeducation than male immigrants (33 per cent vs 29 per cent). Around 45 per cent of male immigrants are undereducated, which is 26 per cent higher than the incidence of undereducation of native males (Chiswick and Miller, 2009a).

4.3.6.2 What causes the educational mismatch among immigrants?

Chiswick (1978) finds that wage returns to schooling of foreign-born workers are smaller than the native-born when initially entering the labour market in the U.S. Chiswick and Miller (2009b) further attributed this to "less-than-perfect international transferable of human capital across borders", which is the main concern in the study of immigrant adjustment literature. When immigrants first came to the receiving countries, they may encounter a series of handicaps. The most obvious one is the language weakness. Despite this, they may find that their skills, on-the-job training obtained from home countries couldn't be fully applied. In addition, the formal schooling gained from the country of origin is not equally treated as the schooling in the destination countries by employers. They would be required to have more years of schooling than natives to conduct a given occupation. Therefore, they are more likely to be assigned to a job for which they are overeducated.

Another important reason is the favourable selection among immigrants, especially prevalent in those less-well educated (Chiswick and Miller, 2009b). Chiswick (1978) argues that only those who are talented and have high motivation are more likely to migrate. Due to high level of ability and skills that can be used to substitute the shortage of formal schooling, they are favoured by the employers and easily observed in jobs where the required level of education is higher than their own educational attainment.

Labour market discrimination effects also can be used to explain the educational mismatch and subsequent wage differentials between immigrants and natives (Nielsen, 2007). Discrimination in the labour market can be defined as workers who have the same productivities but are treated differently, i.e. differential wages or treatment, due to the difference in race, ethnicity and gender (Altonji and Blank, 1999). Nielsen (2007) argues that discrimination can be called termed statistical discrimination in terms of overeducation. Employers may make judgements about assigning workers depending on characteristics that can be treated as indicators of performance, such as gender, race and ethnicity rather than education or qualifications if they don't have enough information about their employees. In other words, employers would judge a worker's employability depending on the average skill level of the groups this worker belongs to. Battu and Sloane (2004) argue non-whites in the UK are more likely to find a job that is lower than their educational level than white natives simply due to this kind of discrimination. Regarding immigrants, if employers have doubts about immigrants' abilities, no matter what skill level an individual employee actually has, one might expect that overeducation is more likely to happen among immigrants[89].

4.3.6.3 Applications of basic theories of educational mismatch among immigrants

Throughout the overeducation literature, seven theories can be used to explain reasons of educational mismatch, which are (1) search and match theory, (2) human capital theory, (3) assignment theory, (4) technological change theory, (5) signaling, (6) career mobility theory and (7) job competition theory[90]. However, in the comparative study of overeducation between immigrants and native workers, five theories display specific features. To the best of my knowledge, Chiswick and Miller (2009b) is the first to extend basic theories in the overeducation literature to the systematic analysis of overeducation among immigrants.

Search and match theory

In terms of immigrants, imperfect information is a common issue when they first enter the labour market of destination countries, especially when the home labour market of immigrants is different from the labour market of receiving countries. They are not familiar with the characteristics and regulations in the labour market of destination countries. Both employers and employees don't have enough information about each other, which may cause potential frictions. However, the extent of overeducation of immigrants may reduce with the duration in the destination country as more human capital and labour market information is accumulated in the destination country. Imperfect information is also reflected in that employers in destination countries may have doubts about the credentials owned by immigrants. There is no specific implication of undereducation among immigrants under this theory. However, Hartog (2000) argues that in the search process, both natives and immigrants would search for occupations with a higher level of required education. According to the goal of wealth

[89] If employers choose to hire a native rather than an immigrant just because of imperfect information, this would not be classified as discrimination (Nielsen, 2007).

[90] Detailed descriptions of seven theories are presented in section 2.3.5.

maximization, workers only move job if a future job has a higher required educational level than the current one. Therefore, the incidence of undereducation may increase with age or experience for all workers.

Human capital theory

Although there are some real difficulties in transferring both formal schooling and labour market experience gained from home countries to destination countries, the transferability of formal schooling is higher than work experience. That is to say, immigrants can use formal schooling to substitute the lack of work experience in the receiving country to some extent but not that easily. Therefore, overeducation is more likely to happen among immigrants, especially for the new entrants. Overeducation should be a transitory situation when immigrants switch to a higher level of job after accumulating more working experience in the host countries (Chiswick and Miller, 2009b).

Using ability or motivation to compensate for the lack of schooling needs to be taken into consideration if there is a favourable selection from employers or self-selection in the migration based on ability or motivation. Among immigrants with lower level of schooling, more able immigrants and immigrants with high motivation are more likely to migrate. Therefore, they are more likely to find a job that requires higher level education than their own compared with native workers. There should be no change with the length of residence.

Assignment theory

Assignment theory states that the assignment of jobs considers both the demand side and supply side in the labour market. That is to say, job placement is allocated depending on the match between different characteristics of employees and the heterogeneous requirement of jobs (Sattinger, 1993). However, according to Chiswick and Miller (2009b), there are no specific implications in terms of the labour market of immigrants.

Technological change theory

In terms of immigrants, this theory concerns different levels of development of home countries and receiving countries of immigrants. For instance, if an individual from a less developed country migrates to a developed country, he is more likely to report overeducation than immigrants from developed countries with a given level of schooling because of the lack of relevant destination-based skills. However, this theory has no implications for undereducation.

Signaling

For immigrants, a risk-averse employer may have doubts about the credentials immigrants obtained from the home countries, especially when there is a disparity between the labour market of home countries and receiving countries, and thus immigrants are more likely to be treated as overeducated when they first arrive.

Career mobility theory

According to the career mobility theory, overeducated people are willing to choose a job for which their educational levels are higher than the actual educational level needed in this job in order to acquire skills or better opportunities to make a career upgrade in the future. For immigrants, overeducation is a voluntary choice in their early career stages to gain skills or labour market experience and then move to a higher level (better-paying or higher ranked) of job that matches their educational level. Similar to the human capital theory, the incidence of overeducation will decrease as individuals accumulate more labour market experience in the receiving country. However, some scholars argue that this theory is unrealistic (Sicherman,1991); (Büchel and Mertens, 2004); (Nielsen, 2007). Therefore, its implications for immigrants need to be confirmed in further empirical research.

Job competition theory

Based on the job competition theory, people will increase investment on education in order to get a higher rank in the job queue and increase the possibility to acquire the job compared with other workers competing for the role. However, for immigrants, there is no evidence indicating that they increase their investment on education in order to keep their position in the job queue in the receiving country.

4.3.6.4 Wage effects of overeducation and undereducation among immigrants

In terms of earning consequences of overeducation in the literature, two models are widely used, the ORU equation and VV equation (Hartog, 2000)[91]. Empirical evidence implies that overeducated people earn more than people who work in the same job but are correctly educated, but earn less than people who have the same level of education. Undereducated people have higher wages than people who have the same educational level but are correctly educated, but earn less than people who work in the same job but are correctly educated (Tsang and Levin, 1985); (Alba-Ramirez, 1993) and (Groot and Maassen Van Den Brink, 2000). In terms of immigrants, many scholars suggest that the patterns of return to schooling of immigrants based on the ORU equation are similar with those of natives (Chiswick and Miller, 2008); (Nielsen, 2007); (Sanroma et al., 2008). To the best of my knowledge, there is no study employing the VV equation to explore wage effects of overeducation and undereducation among immigrants.

4.3.6.4.1 Wage returns to overeducation: Quantile Regression

There are few studies adopting quantile regression methodology to examine the phenomenon of overeducation in the literature. Focusing on a cohort of Northern Ireland graduates, McGuinness and Bennett (2007) find that the wage penalty of overeducation is larger in the lower distribution of wage distribution, but this is only true for male graduates. In addition, female graduates who are overeducated earn less than individuals who have the same level of schooling but are correctly educated across the whole wage distribution. McGuinness and Bennett (2007) argue that low ability can be part of the explanation for the wage penalty of overeducation and the existence of wage effects for overeducation in the middle and higher part of the distribution may due to the oversupply of graduates. Budría and Moro-Egido (2007) explore the phenomenon of overeducation in 12 European countries using quantile regression techniques. They find that the wage penalty of overeducation exists along the whole wage distribution. Overeducation can determine productivity regardless of ability level. Budria (2011) argues that educational mismatch should be not be simply explained by a lack of innate ability, by reporting that the negative wage effects of overqualification increase as we move up the distribution, which is contrary to findings in McGuinness and Bennett (2007) [92]. All of the above literature is based on

[91] Detailed descriptions can be found in Chapter 2.
[92] Three kinds of educational mismatch are illustrated in the analysis, overqualifications, strong educational mismatch and skill mismatch.

the point of view that the quantile regression can be used to explore the relationship between educational mismatch and unobserved ability[93]. Undereducated people are always individuals with high ability, more experience and are involved in the supervisory roles in firms (Verdugo and Verdugo, 1989), thus relevant analysis of wage premiums of undereducation is omitted in the literature.

4.3.7 What causes the educational mismatch of rural-to-urban migrant workers in China?

The above literature presents the extent of educational mismatch of immigrants, providing possible reasons and relevant theories to explain the difference in the educational mismatch between immigrants and natives. However, in the context of the Chinese labour market, although rural-to-urban migrants migrate within the same country, it is not similar with the popular patterns of internal migration in many countries[94]. The household registration system (Hukou) acts as an "internal passport" that splits the Chinese urban labour market into two segments, which is comparable to the labour market encountered by the immigrants and natives. Rural-to-urban migrant workers have national identity cards as their temporary working and living permits in the urban area in China, while international immigrants have visas as their permit to work and live in the receiving countries.

Immigrants can be classified into two groups: better-educated (high-skilled) and less-educated (low-skilled). Better-educated immigrants are more likely to be overeducated and most international immigrants (such as "green card" high-skilled immigration in the US and Germany) and minority ethnic groups are better educated and more employable compared to white natives on average in the international migration literature. Chiswick and Miller (2009a) argue that the incidence of undereducation should be higher among immigrants than natives due to the favourable selection into immigration especially for the less-well educated (for example, a taxi driver working in a developed country but from a developing country with six years of formal schooling). In terms of rural-to-urban migrant workers in China, many have lower educational levels than urban residents and mainly focus on low-paid and unskilled

[93] Detailed discussion of the framework of using quantile regression to indicate unobserved ability can be seen from McGuinness and Bennett (2007) and Budria (2011).
[94] For example in UK and EU countries (Cheng et al., 2014a).

jobs. The following paragraphs consider factors that might cause educational mismatch to occur among rural-to-urban migrant workers.

According to the search and match theory, immigrants may choose a job that does not match with their educational attainment when they first enter the destination country due to imperfect information. Then they may move to a higher level of job that matches with their educational level to improve the education-job match with accumulated labour market experiences and better information set. For rural-to-urban migrant workers in China, seeking jobs through family members and relatives is a very important channel to obtain jobs in the urban labour market (Liu et al., 2012); (Wang, 2008); (De Brauw and Giles, 2008). Personal contacts play a primary role in finding a job in the urban labour market for rural migrant workers. Meng (2000) argues that this ad hoc manner of finding a job may interrupt the efficient allocation of the migrant labour force in the urban labour market. Based on this fact, one can expect that the educational mismatch may happen among rural-to-urban migrant workers.

For immigrants, there are some difficulties in transferring formal years of schooling gained from the home country to the receiving country based on the human capital theory. One year of schooling in the host country is not equal to one year of schooling in the destination country (Chiswick and Miller, 2009b). Due to the different quality of schooling between rural and urban areas in China, one year of rural schooling is not equivalent with one year of urban schooling (Fu and Ren, 2010). Moreover, Heckman and Li (2004) argue that migrant workers not only have fewer years of education, but also acquire disadvantaged compulsory education. That is to say, human capital accumulated in the rural area can not transfer perfectly to the urban labour market, which may give rise to the educational mismatch among rural-to-urban migrant workers[95].

International immigrants (or ethnic groups) are more likely to be overeducated than white natives because of the possibility of discrimination. Due to the existing discrimination effects in the urban area caused by the Household registration system in

[95] In China, it is very difficult for migrants' children to go to schools in the urban area (Démurger and Xu, 2013). So we can assume that migrant workers all receive rural education before they work in the urban area.

China, rural-to-urban migrant of labour is strictly restricted to those low skilled jobs, low status and low-paying jobs or 3D jobs (dirty, dangerous and demanding), which normally do not require high school education to perform (Meng and Zhang, 2001). The discrimination effects might be one important reason to explain the overeducation among rural-to-urban migrant workers.

Within rural migrant workers, new generation of migrant workers are considered to be more educated than the old generation. However, due to the Hukou system, occupation types that can be chosen by migrant workers don't change too much, which may lead to the higher incidence of overeducation in the new generation migrant workers than the old generation. In addition, new generation migrant workers treat migration as a pathway to pursue their career plan in order to have long term development and learn skills (Wang, 2008). They are more likely to choose a job lower than their educational level to gain skills and wait to be promoted in the future, which is consistent with the career mobility theory. In terms of the old generation, they can use work experience gained in the urban labour market to substitute the lack of schooling, so the phenomenon of undereducation is more common in the old generation migrant workers under the framework of the human capital theory. It is also possible that as more new generation migrant workers enter the labour market, the mean level of educational level within occupations will increase. As a result, those who were previously well-matched old generation migrant workers become undereducated due to the "bump down effects" (Battu et al., 2000); (McGuinness, 2006).

4.4 Data

Only a few datasets are available to facilitate the research of migration in China[96]. In this chapter, a unique dataset is employed, The Rural-Urban Migration in China (RUMiC), conducted by a group of researchers at the Australian National University, the University of Queensland and the Beijing Normal University and supported by

[96] In the first three population censuses of the People's Republic of China in 1952, 1964 and 1982, questions regarding migration are not included (Liang, 2001). However, detailed questions about migration are included in the China One Percent Population Sample Surveys since 1987. Zhu (2002) summarises the problems that exist in surveys of migration.

IZA. This is the latest and most comprehensive dataset focusing on migrant workers in China[97].

The Rural-Urban Migration in China consists of three separate surveys: the Urban Household Survey (UHS), the Rural Household Survey (RHS) and the Migrant Household Survey (MHS)[98]. This project was firstly conducted in 2008. Up to now, four waves of the Urban Household Survey (UHS) and the Rural Household Survey (RHS) have been collected and the Migrant Household Survey (MHS) contains five waves of data. The longitudinal characteristic of this project enables scholars to make longitudinal analysis of migrant workers in China. However, only the first two waves of the China data (2008, 2009) have been published to date.

Each survey contains detailed information on household members, health conditions, education and training, employment situation, children's education, social network and household income and expenditure. In addition, the Migrant Household Survey also records the relevant history of migration (Akgüç et al., 2014).

The RUMiC survey is conducted in a representative and large-scale geographical scope in China to obtain a representative picture of migrant workers. Ten provinces or metropolitan areas are involved in the survey, which are Shanghai, Guangdong, Jiangsu, Zhejiang, Hebei, Anhui, Hubei, Sichuan, Chongqing and Henan. Survey regions are displayed explicitly in the map below.

[97] This dataset is designed specifically to explore the role of migrant workers in the Chinese labour market. Detailed discussion of the advantages of RUMiC over other datasets (The Chinese Household Income Project (CHIP) and the China Health and Retirement Longitudinal Study (CHARLS) are presented in Akgüç et al. (2014).

[98] The Rural Household Survey contains about 8000 households and around 5000 households are involved in the Migrant Household Survey and there are 5000 households covered in the Urban Household Survey (Akgüç et al., 2014).

*Source: https://www.rse.anu.edu.au/research/centres-projects/rural-urban-migration-in-china-and-indonesia/

Shanghai (Province No. 6), Guangdong (Province No. 8), Jiangsu (Province No. 2), Zhejiang (Province No. 7), shown in red area in the map, are the four largest migration destinations. They are all located in the eastern region, which is the most developed area in China. Anhui (Province No. 5), Hubei (Province No. 4), Henan (Province No. 1), Sichuan (Province No. 3) and Chongqing (Province No. 10) are five largest migration sending areas. Among them, Anhui (Province No. 5), Hubei (Province No. 4) and Henan (Province No. 1) belong to the central region in China. Sichuan (Province No. 3) and Chongqing (Province No. 10) are two representative provinces in the western region. Most rural-to-urban migration in China is from the western region to the middle region and the eastern region (Liang et al., 2014).

In this chapter, the Migrant Household Survey (MHS) and the Urban Household Survey (UHS) in 2009 are employed[99]. Migrant workers are defined as those individuals who have a rural Hukou registration and work in a city with a positive wage when they responded to the survey. Comparably, urban workers refer to those who hold urban household registration status (*hukou*) working in the urban areas with positive wages when they were surveyed. Moreover, all the individuals are restricted

[99] Using 2009 wave is to explore relevant issues after the crisis in 2008.

to those between the age 16 and 60 in both urban and migrant workers samples[100]. Those who are students, retired, family business helper without pay and have zero or unknown income are omitted from the analysis. In addition, we only consider wage-earners. Those who are self-employed are excluded in this chapter due to the difficulty in obtaining reliable income figures from their business. After deleting all the missing values in the two datasets, 3301 observations remain in the migrant workers sample and 5921 observations are kept in the urban household sample. Table 4-1 and Table 4-2 present the summary statistics of all the dependent and independent variables used in the migrant sample and urban sample respectively.

With respect to the heterogeneity of rural-to-urban migrant workers, I adopt the division line: the Year 1980 to define the new and old generation migrant workers in this chapter[101]. Those individuals who were born before year 1980 are called the old generation migrant workers. The remaining individuals who were born in and after 1980 are defined as the new generation migrant workers. Based on this classification, 1393 observations (42%) are treated as the old generation and 1908 (58%) observations are the new generation migrant workers[102].

The dependent variable in this chapter is the logarithm of average hourly wages[103]. Note that the average hourly wage includes all bonuses, allowances and earnings in kind[104]. According to the literature, using the hourly wage rather than monthly or annual wages may provide more precise estimation of the wage return to schooling (Li, 2003)[105]. As can be seen in Table 4-1 and Table 4-2, the logarithm average hourly wage of urban workers is much higher than that of migrant workers. Figure 4 and Figure 5 show the distribution of logarithm of hourly wage of migrant workers and

[100] The minimum working age is 16 and the mandatory retirement age is 60 in China (Zhang et al., 2005). Age range of the sample in this chapter is also consistent with Chapter 2 and Chapter 3.

[101] See discussion in section 4.3.5.

[102] According to data in 2009 in the National Bureau of Statistics of China, 62 per cent of migrant workers are new generation migrant workers. However, this ratio contains migrant workers working in the Town and village enterprises.

[103] Information about working hours per week is available in the RUMiC. Using working hours a week and the monthly wage, we can get hourly wages.

[104] Wage questions asked in the Urban Household Survey and the Migrant Household Survey are similar, which is an advantage of the RUMiC survey. However, in the Chinese Household Income Project (CHIP), questions concerning earnings are different for the urban residents and rural migrant workers, which may result in biased estimation when making a comparative study of urban workers and rural workers.

[105] Li (2003) argues that less educated individuals tend to work longer hours on average. Therefore, using monthly wage or annual wage may underestimate the wage return to education.

urban workers respectively. In Figure 4 and Figure 5 we can see that both migrant and urban samples are right-skewed [106]. In this case, applying quantile regression methodology is more suitable than the OLS method[107]. In order to better describe the disparity of wages between the old generation of migrant workers and the new generation of migrant workers, the kernel density of the logarithm of hourly wage is presented in Figure 6. According to Figure 6 we can see that the new generation migrant workers have higher densities towards the right side of the wage distribution than the old generation of migrant workers.

Figure 4: The distribution of logarithm of hourly wage for migrant workers

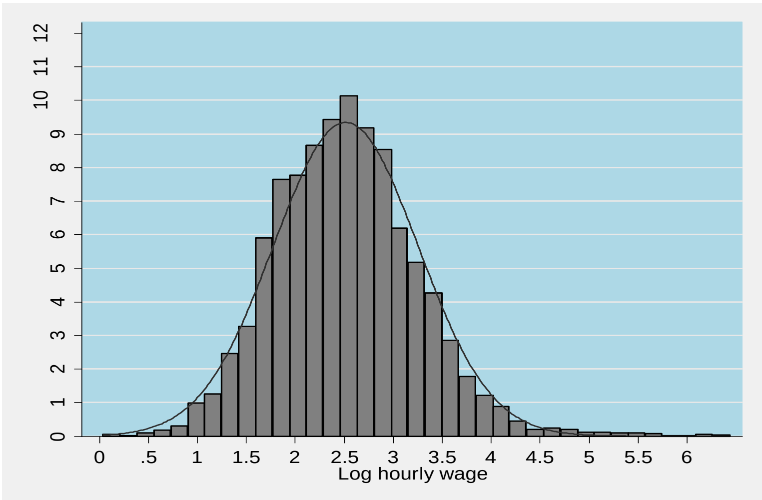


Figure 5: The distribution of logarithm of hourly wage for urban workers

[106] Skewness is an indicator to judge the symmetry of the wage distribution. If the skewness is negative, the distribution is left-skewed and if there is a positive skewness, the distribution is right-skewed. The skewness of migrant sample and urban sample are 0.1258 and 0.4963 respectively.
[107] In a skewed distribution, the median is a better measurement than the mean to represent central tendency. Assumptions of normality and homoscedasticity in the OLS are not suitable for a skewed distribution. However, quantile regression doesn't have such assumptions.

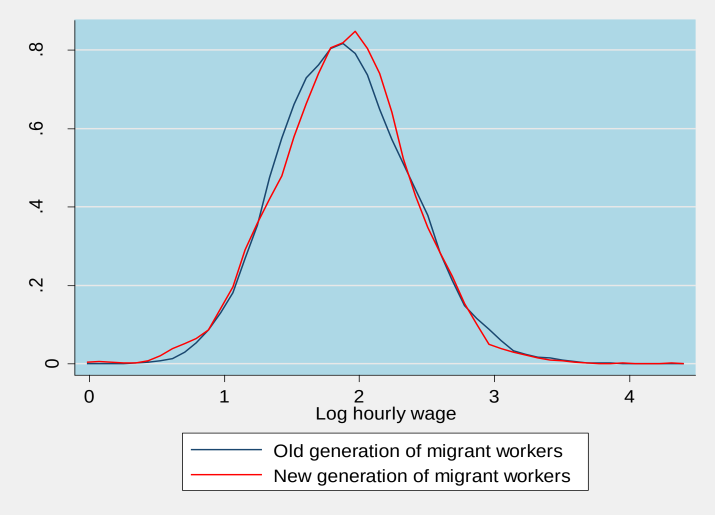


Figure 6: Kernel density of logarithm of hourly wage distribution between the old and new generation of migrant workers

Table 4-3 shows that the average hourly wage of urban residents is 2.3 times more than that of migrant workers (17.256 versus 7.485). There are large wage differentials between migrant workers and urban residents, which is confirmed by a strand of studies (Maurer-Fazio and Dinh, 2004); (Démurger et al., 2009); (Frijters et al., 2010). Moreover, the hourly wage of migrant workers at 50th percentile is lower than the hourly wage of urban residents at the 25th quantile, which may explain why the competition between rural-to-urban migrant workers and low-skilled or unskilled urban residents increased fiercely over recent years (Démurger et al., 2009). Furthermore, as shown in Table 4-3, wage inequality is more serious among urban workers than in the migrant sample according to the wage ratio of 90th percentile to 10th percentile. One possible explanation for this is that higher average educational level of urban residents is associated with higher wage inequality[108].

4.4.1 Personal characteristics

In the RUMiC 2009, individuals are asked to report both their highest educational level and completed years of schooling. According to Table 4-1 and Table 4-4 we can see that on average, the new generation migrant workers have two more years of schooling than the old generation, while the urban residents have three more years of

[108] For lower educational levels, the dispersion of skill may be low, while in higher educational levels, the differences in ability may lead to the wage gap between high-ability and low-ability individuals (Martins and Pereira, 2004).

schooling than migrant workers[109]. In terms of the highest educational level as indicated in Figure 7, about 23.55 per cent of the old generation migrant workers have primary school or less education, while only 3.62 percent of the new generation migrant workers have this educational level. The reason for this may be the gradual prevalence of nine-year compulsory education settled in 1986 by the government for those in the rural area. In addition, the percentage of vocational school is much higher in the new generation than the old generation among migrants (18.24 percent versus 3.88 percent). After finishing compulsory education, students are allowed to make a choice between academic school and vocational school through an admission test (De Brauw and Giles, 2008). This large disparity between the proportions of vocational school attendance may reflect the different preference of the Post-compulsory education between generations of migrant workers. For new generation migrant workers, in order to find a better job in the urban labour market, acquiring vocational education is an efficient way to improve productivity to in order to obtain higher income. Meanwhile, this also indicates that the demand of skills-based migrant workers is gradually replacing the demand for labour-based migrant workers in the urban labour market. Regarding higher education, the percentage of individuals holding a higher education degree is 6 percentage points higher in the new generation than in the old. Based on the above results, although the average years of schooling is higher in the new generation migrant workers than the old generation, only 61 per cent of migrant workers acquired the junior middle school or less, which is indicated in Table 4-4. About 57 per cent of urban residents have vocational education or above. The disparity of educational level between urban residents and migrant workers is quite sharp.

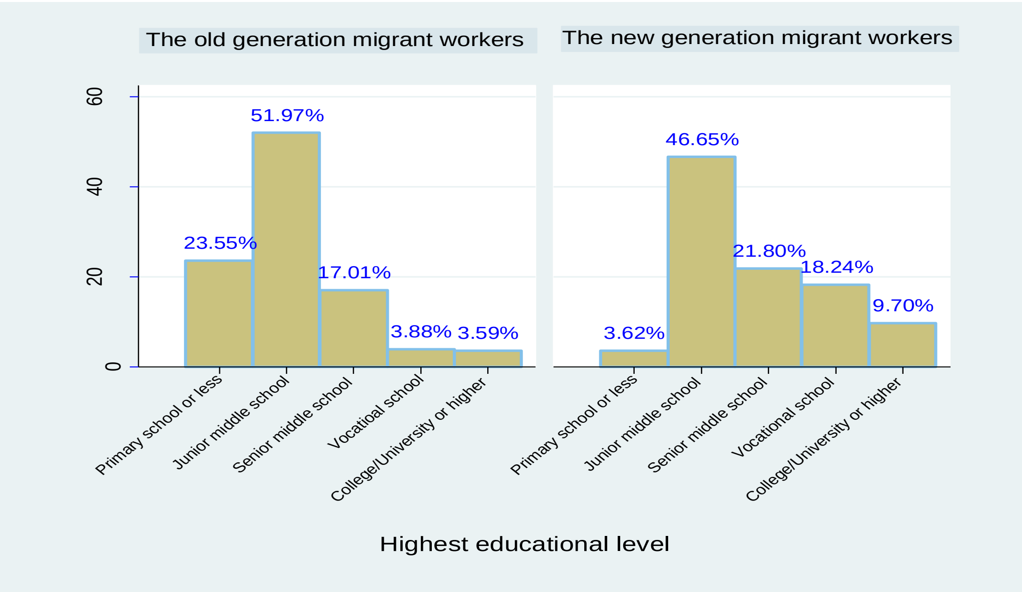
Training is another important dimension of human capital (Becker, 1962). In this chapter, training is measured as a dummy variable if individuals have taken any training or apprenticeship except for the formal education at school[110]. We can see from Table 4-1 that although the new generation migrant workers are more highly trained than the old generation migrant workers, the training ratio in the whole migrant

[109] Démurger et al. (2009) show that urban residents have 4 more years of schooling than migrant workers.

[110] In the RUMiC migrant sample, training is further classified into four groups: agricultural training, corporate internal non-agricultural training, non-agricultural training in the community and other trainings. Individuals can choose maximum three kinds of training according to time sequence. However, training information is not available in the RUMiC urban sample.

sample is still very low. Only about 27.3 per cent of migrant workers received training in addition to the formal education. Enhancing the training of migrant workers arguably still has a long way to go.

Figure 7: Highest education levels between the old generation and new generation of migrant workers



As can be seen from Table 4-1 and Table 4-2, the average age of the new generation migrant workers is around 23 years old, while the mean age of the old generation migrant workers is close to 40 years old[111]. In Table 4-1 in the migrant sample, there are more male migrant workers than female migrant workers. In the old generation migrant workers, about 61 per cent of migrant workers are male, while among the new generation migrant workers, the proportion of males is slightly lower at around 58 per cent. In the urban sample, shown in Table 4-2, the percentage of male workers is higher than female workers (55.9 per cent versus 44.1 per cent). In addition, there are more married old generation migrant workers than that in new generation, which is influenced by the life cycle theory. The percentage of urban workers who are married is much higher than migrant workers. In terms of ethnicity, there is no significant difference between the migrant workers and the urban samples.

[111] The average age of the new migrant workers is 25 years old and the average age of old generation is 41 years old in Wang et al. (2013). It also adopts the same division line as this chapter.

4.4.2 Work-related characteristics

Experience is measured by tenure in the current job rather than the potential working experience for both migrant workers and urban residents[112]. Compared with the old generation migrant workers, new generation migrant workers are less experienced. Because of their relative young age, new generation migrant workers by definition have relatively short job tenure. Urban residents have ten more years of working experience than migrant workers (13 years versus 3 years)[113]. This may be explained by the temporary nature of migration of rural-to-urban migrant workers and rural-to-urban migrant workers are easily to switch jobs (Zhao, 2004).

According to the China National Industrial Classification, there are six industries classified in both migrant and urban sample, which are Agriculture, forestry and animal husbandry, Manufacture, production and construction, transportation and information transmission, finance and business, public and service sectors[114]. In terms of the migrant sample, we can see that about 43.6 per cent of migrant workers find jobs in the service sector and approximately 37.3 per cent of migrant workers work in the manufacturing and construction sectors. The employment rate in the information transmission and transportation, public and business and finance sectors is below 10 per cent. The disparity of industry distribution between the old generation migrant workers and the new generation migrant workers mainly exists in the service sectors and manufacturing and construction sectors. Nearly half of the old generation migrant workers are in the manufacturing and construction sectors, while more than 50 per cent of the new generation migrant workers are in the service sector. In addition, as can be seen from Table 4-2, about 35.4 per cent of urban residents worked in public and finance and business industry and the following are second industry including manufacture, production and construction industries (26.1 per cent) and service industry (24.0 per cent). Only 0.7 per cent of urban residents involve in the agriculture, forestry and animal husbandry.

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[112] For migrants, other working experience may be agricultural experience or other experiences that is not relevant to the current job in the urban area.

[113] Frijters et al. (2010) report similar results using RUMiC 2008.

[114] Based on the China National Industrial Classification (GB/T 4754—2011) issued by the National Bureau of Statistics of People's Republic of China, broad industries can be divided into three: first industry, second industry and tertiary industry. First industry includes agriculture, forestry and animal husbandry. Second industry contains mining, manufacturing, production and supply of electricity, gas and water. Information transmission, finance and business, public and service sectors are all in the tertiary industry. Detailed industry classification in the migrant sample can be seen from Table C 2.

The RUMiC provides two different occupation classifications for migrant workers and urban workers, so we cannot make a direct comparison between these two samples in terms of occupation. Table 4-5 shows the occupation categories in the rural-to-urban migrant sample and the urban sample. The key point we can see from Table 4-5 is that migrant workers are more likely to work in blue-collar jobs (service and manufacture workers) than are urban residents[115]. There is a huge disparity of ownership types between migrant workers and urban residents. As can be seen from Table 4-1 and Table 4-2, only 15.6 per cent of migrant workers have jobs in public enterprises, but about 65 per cent of urban residents worked in the public sector[116]. Within the migrant groups shown in Table 4-1, there are fewer new generation migrant workers working in public enterprises than the old generation migrant workers (12 per cent versus 20 per cent). In terms of job type, only 13.6 per cent of migrant workers have permanent jobs. However, for urban residents, this percentage is 34 per cent. There are no significant differences in employment characteristics regarding firm size and job type between the old generation and new generation migrant workers.

Table 4-6 shows the information on working hours per week of migrant workers and urban residents. Working hours a week for old generation migrant workers are a little higher than the new generation migrant workers (57.47 hours vs 57 hours). However, average working hours a week of both generations are all above the legal 44 hours a week[117]. Average working hours for urban residents is 42.40 hours a week.

In terms of the distribution of regions that are shown in Table 4-7, about 61 per cent of migrant workers worked in the east region (see the red area in the map Page 171). 23 per cent and 16 per cent migrant workers accumulated in the middle and western regions respectively (see the pink area in the map Page 171). The proportion of the new generation migrant workers in the eastern region and western regions are lower than the old generation migrant workers, while the percentage of new generation

[115] Due to few observations in "Professionals" (13 observations), "Boss of private enterprises" (12 observations) and "Other category" (4 observations), I excluded them in the sample.
[116] Ownership types in this chapter are classified into two categories: public enterprises (state-owned enterprises and collective-owned enterprises) and non-public enterprises (private-owned enterprises, foreign-owned enterprises, joint-venture and other enterprises).
[117] According to the Labour Law of the People's Republic of China Article 36, the legal working hour is no more than 8 hours a day and maximum 44 hours a week on the average in China.

migrant workers employed in the middle region is higher than the old generation migrant workers (24.74 per cent versus 20.60 per cent). There are different patterns of regional distribution between the old and new generation migrant workers. In this chapter, in order to control for regional differences, nine provincial dummy variables are included in the analysis[118]. Guangdong is the benchmark province because it is the most developed province since the economic reform and the immigration rate is in the top in the 2000s (Cui et al., 2013).

4.4.3 Educational mismatch

There are three widely mentioned ways to measure educational mismatch: (1) Job analysts; (2) Workers' self-assessment and (3) Realised matches[119]. The first two measures are not possible using the RUMiC survey. Thus in this chapter, realised matches is adopted to measure educational mismatch. There are two ways of measuring overeducation in realised matches method: the mean index and the mode index. The mean index is defined as people who are overeducated if their years of schooling is higher than one standard deviation above the mean level of years of schooling within a specific occupation. In the mode index, overeducation can be defined as if workers' educational level is higher than the mode level of educational attainment in a given occupation. I adopt the mean index to define overeducation and undereudcation[120]. In addition, I aggregate some occupation categories to define overeducation and undereducation rather than disaggregate occupation categories in the migrant sample because there are few observations in some occupations[121]. The mean educational level in each occupation is generated by migrant sample and urban sample separately.

According to Table 4-8, we can see that the incidence of overeducation of rural-to-urban migrant workers is higher than urban residents (16.69 per cent compared to 10.72 per cent). Within migrant groups, the incidence of overeducation is higher in the new generation than the old generation (21.91 per cent versus 9.55 per cent) and the

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[118] In this chapter, the eastern region contains Guangdong, Jiangsu, Zhejiang and Shanghai. Henan, Anhui and Hubei represent for the middle region. Chongqing and Sichuan belong to the west region.
[119] Detailed discussion of the advantages and disadvantages in each method is cited in Chapter 2.
[120] In the RUMiC, people are asked to report both years of schooling and the highest level of education completed. However, reported years of schooling exclude years of skipping or failing a grade, which is more explicit and scientific than highest level of education to measure accumulated human capital.
[121] Detailed application of occupation category can be seen in Table C 1 in the appendix.

incidence of undereducation is higher in the old generation migrant workers than the new generation (23.12 per cent versus 4.09 per cent). The incidence of undereducation of migrant workers is quite similar with incidence of undereducation among urban residents (12.12 per cent versus 12.55 per cent).

Table 4-9 describes the incidence of educational mismatch across the wage distribution for migrant workers and urban workers. It is interesting to see that as we move up the wage distribution, the incidence of overeducation increases and the incidence of undereducation decreases regardless of migrant workers or urban workers, which is in contrast to the notion that overeducation is more prevalent in the lower part of the wage distribution and the incidence of undereducation increases along the wage distribution (McGuinness and Bennett, 2007)[122].

4.5. Estimation methodology

4.5.1 Estimation models

This section will discuss the models employed in this chapter. First, we adopt the basic Mincer equation (section 4.3.1) as the baseline model to estimate wage returns to schooling among rural-to-urban migrant workers, which is described as follows:

$$\ln Y_m=\alpha_0+\alpha_1 S_m+\gamma_1 E_m+\gamma_2 E_m^2+\theta_1 X_m+\varepsilon_m \qquad (8)$$

where Y_m is the average hourly wage including wages, bonus, allowance and earnings in kind. S_m is completed years of schooling, E_m is tenure in the current job, E_m^2 is tenure squared. X_m is a vector of control variables that probably affect earnings, which contains personal characteristics (age, age squared, male, marriage, ethnicity, training), employment characteristics (industry, ownership, firm size and job type) and provinces[123]. The subscript *m* represents for rural-to-urban migrant workers.

[122] The only exception is from 10th to 25th for undereducation in the migrant sample.
[123] In this chapter, occupation controls are omitted from the regressions for two reasons: (1) use aggregate occupation to define overeducation; (2) Schultz (1988) argues that wages and occupations may be jointly determined.

4.5.1.1 Heterogeneous wage returns to education in the old generation and new generation of rural-to-urban migrant workers

Following the specification of equation (8), one dummy variable to control for differences in generations is added in the regression:

$$\ln Y_m = \alpha_0 + \alpha_1 S_m + \gamma_1 E_m + \gamma_2 E_m^2 + \theta_1 X_m + \rho_1 old_m + \varepsilon_m \quad (9)$$

The dummy variable "old" is equal to 1 if individuals are classified as the old generation of migrant workers and 0 for the new generation of migrant workers.

In order to explore the possible difference in rates of return to schooling between the old and new generation of migrant workers, we add an interaction term "$old*S$" to the model:

$$\ln Y_m = \alpha_0 + \alpha_1 S_m + \gamma_1 E_m + \gamma_2 E_m^2 + \theta_1 X_m + \rho_1 old_m + \rho_2 old_m * S_m + \varepsilon_m \quad (10)$$

The coefficient of the interaction term ρ_2 shows the difference in the wage returns to education between two generations of migrant workers. The wage return to education for the new generation of migrant workers is α_1 and $\alpha_1 + \rho_2$ represents the wage returns to schooling for the old generation of migrant workers.

4.5.1.2 Wage effects of overeducation in the old generation and new generation of rural-to-urban migrant workers

Wage effects of educational mismatch of migrant workers are addressed in this subsection. According to the literature, overeducated people should have a wage penalty for surplus education and undereducated people may have wage premium compared to individuals with similar educational level but are correctly educated. Two dummy variables, "$OVER$" and "$UNDER$" are added in to model following the specification of equation (8) and (9) to control for the wage effects of overeducation and undereducation:

$$\ln Y_m = \alpha_0 + \alpha_1 S_m + \gamma_1 E_m + \gamma_2 E_m^2 + \theta_1 X_m + \varphi_1 OVER_m + \varphi_2 UNDER_m + \varepsilon_m \quad (11)$$

$$\ln Y_m = \alpha_0 + \alpha_1 S_m + \gamma_1 E_m + \gamma_2 E_m^2 + \theta_1 X_m + \rho_1 old_m + \varphi_1 OVER_m + \varphi_2 UNDER_m + \varepsilon_m \quad (12)$$

Considering the possibility of different wage effects of overeducation and undereducation between the two generations of migrant workers, two interaction terms, "$old * OVER$" and old*$UNDER$", are added into the analysis, which can be defined as:

$$\ln Y_m = \alpha_0 + \alpha_1 S_m + \gamma_1 E_m + \gamma_2 E_m^2 + \theta_1 X_m + \rho_1 old_m + \varphi_1 OVER_m + \varphi_2 UNDER_m + \varphi_3 old_m * OVER_m + \varphi_4 old_m * UNDER_m + \varepsilon_m \quad (13)$$

In equation (13), φ_1 and φ_2 represent the wage effects of overeducation and undereducation for the new generation of migrant workers. The wage effects of overeducation and undereducation for the old generation migrant workers are presented by $\varphi_1 + \varphi_3$ and $\varphi_2 + \varphi_4$ respectively. Overeducated workers in the old generation have φ_3*100% higher (or less) wages than overeducated workers in the new generation and undereducated workers in the old generation have φ_4*100% higher (or less) wages than overeducated workers in the new generation. Different wage effects of overeducation and undereducation between the two generations can be expressed by φ_3 and φ_4.

4.5.1.3 Wage returns to schooling and educational mismatch for urban residents

Because of the data availability of urban sample, two basic models are conducted as follows:

$$\ln Y_u = \alpha_0 + \alpha_1 S_u + \gamma_1 E_u + \gamma_2 E_u^2 + \theta_1 X_u + \varepsilon_u \quad (14)$$

$$\ln Y_u = \alpha_0 + \alpha_1 S_u + \gamma_1 E_u + \gamma_2 E_u^2 + \theta_1 X_u + \varphi_1 OVER_u + \varphi_2 UNDER_u + \varepsilon_u \quad (15)$$

where Y_u is the average hourly wage including wages, bonus, allowance and earnings in kind for urban residents. S_u is the actual completed years of schooling, E_u is tenure of current job, E_u^2 is tenure squared. X_u is a vector of control variables that probably affect earnings, which contains personal characteristics (age, age squared, male, marriage, ethnicity)[124], employment characteristics (industry, ownership, firm size and job type) and provinces[125]. Two dummy (*OVER* and *UNDER*) to indicate whether an individual is overeducated or undereducated. The subscript u represents for urban residents.

Heckman (1979) argues that individuals choose to participate in work only if their reservation wages (W_r) are lower than wages offered for them (W). Otherwise, they may refuse to work. However, OLS can only observes those individuals who have information on wages, i.e. $W_r < W$. Those individuals who have higher reservation wages than offered wages are omitted in the analysis, which may lead to sample selection problem. If we fail to take sample selection bias into consideration, OLS may give biased estimates. Considering the possible sample selection bias, I also conduct a Heckman selection model (Heckman, 1979) for all individuals in both the migrant survey and the urban survey[126].

In the migrant sample, the dependent variable in the selection function is 1 if an individual's current work status is employed and 0 for not employed. However, in the urban sample, the selection function is used for workers who have wage information (the dependent variable in the selection function is defined as 1) and those with missing value of wages (the dependent variable in the selection function is 0)[127]. In both the migrant sample and the urban sample, the instruments included in the selection function are a dummy variable to indicate whether there are any young children in the household (young children are defined as those whose age are under 16 years old) and a dummy variable to indicate in a healthy health status[128]. Individuals who have young children are more likely to have higher reservation wages than those without young children due to the cost of child care and thus should be very important in the determination of participating in the labour market. Health status should also influence individuals' decision to work.

[124] There is no information in the urban survey about training for urban residents, so it is not included in the analysis of urban residents.

[125] Common variables in both migrant sample and urban residents are age, age squared, tenure, tenure squared, male, marriage, minority, industry, ownership, firm size and job type and provinces.

[126] Detailed information about Heckman selection model can be seen in Heckman (1979).

[127] No question was asked in the urban survey about current employment status.

[128] Health variable is measured as a dummy variable and it is equal to one when answers to the current health status question are excellent, good or average. Health variable is equal to zero when respondents report their health status as poor or very poor.

Detailed sample selection results can be seen in Table C 7 for the migrant sample and Table C 8 for the urban sample. We conduct three kinds of sample selection results. Model 1 only includes health status in the selection function. Model 2 only contains the young children dummy in the selection function. Both young children and health status dummies are in the selection function in Model 3. The inverse mills ratio, an indicator of the probability of being in a work, is an additional regressor added in the wage equation to measure whether there is a sample selection effects.

4.5.2 Quantile Regression (QR)

After the economic reform in 1978, apparent wage inequality and the uneven wage distribution in China have been addressed by many scholars (Knight and Song, 2003); (Luo, 2008). In this case, the estimation technique OLS, which is based on the mean wage, may yield biased results. In order to avoid this problem, quantile regression is adopted in this chapter to explore the wage return to schooling.

According to the conditional mean function $E(y|x)$, the standard linear regression reflects the average change in the dependent variable if there is a change in a set of independent variables. However, this is only part of the picture of the relationship between the outcome variable and regressors. The effects may vary across the distribution. A complete and comprehensive summary of the relationship should provide information at different points across the conditional distribution of the dependent variable. Quantile Regression (QR) is a useful tool to meet such needs.

We can say that the ordinary least squares (OLS) minimises the sum of the model prediction error squared. The median regression requires the least absolute deviations of error term. Quantile regression requires a minimum of asymmetrically weighted sum of absolute deviations of error term.

The quantile regression model can be written as follows (Koenker and Bassett Jr, 1978):

$$\ln w_i = x_i\beta_\theta + \mu_{i\theta} \quad \text{with} \quad Quant_\theta\,(\ln w_i | x_i = x_i\beta_\theta) \tag{16}$$

where x_i is a vector of control variables. $Quant_\theta$ ($\ln w_i|x_i$) denotes the θ_{th} conditional quantile of w_i given x_i. The θ_{th} regression quantile, 0<θ<1, is defined as the solution to the problem:

$$\min \left[\sum_{i:y_i \geq x_i\beta_\theta} \theta|\ln w_i - x_i\beta_\theta| + \sum_{i:y_{i<x_i\beta_\theta}} (1-\theta)|\ln w_i - x_i\beta_\theta|\right] \quad (17)$$

Quantile θ minimizes a sum that gives the asymmetric penalties $(1-\theta)|\ln w_i - x_i\,\beta_\theta|$for overprediction and $\theta|\ln w_i - x_i\,\beta_\theta|$ for underprediction.

Median regression is a special case of quantile regression where $\theta = 0.5$. There are some advantages of quantile regression over the OLS regression. First, it is robust to outliers. If the distribution of the outcome variable is extraordinary abnormal, quantile regression is more robust than OLS regression. Second, it enables us to investigate the relationship between regressors and the dependent variable at some specific points, like the top decile or the bottom decile, to fully use the characteristics of data. Last but not least, with QR analysis, the assumption of normality and homoscedasticity is not required, as it is with OLS.

In this chapter, estimation from five quantiles, 0.10, 0.25, 0.50, 0.75, 0.90, are analysed in each estimation model with bootstrap standard errors. When there is a existence of heteroscedasticity, standard errors based on Koenker and Bassett Jr (1978) is not satisfactory (Koenker and Hallock, 2001). Standard errors can be easily obtained in bootstrapping in any data distribution (Gould, 1993). Hao and Naiman (2007) argue that the bootstrap method is less sensitive to heteroscedasticity and is a better option to use when standard errors are independent but not identically distributed.

4.6 Empirical analysis

4.6.1 Rural-to–Urban migrant workers

This section presents the estimation of wage returns to education and wage effects of educational mismatch for migrant workers. Table 4-10 presents multivariate regression results of migrant workers in six models (See section 4.5.1 equation 8-13). Model 1 describes the estimates of the basic Mincer equation controlling for personal characteristics, employment characteristics and province information. A dummy variable is added into model 2 to differentiate the old and new generations. Model 3 describes the effects of schooling on earnings between the two generations. Model 4 presents the wage effects of educational mismatch for migrant workers. Model 5 is used to explore the differences between the two generations after taking educational mismatch into consideration. Heterogeneous wage effects of overeducation and undereducation between the two generations are discussed in Model 6. All regressions in Table 4-10 are estimated using OLS. Results of quantile regression are presented in Table 4-11 to Table 4-16.

4.6.1.1 Basic Mincer equation for migrant workers

As shown in Table 4-10 Model 1, the rate of return to education is 3.02 per cent for migrant workers in 2009, which echoes the literature in returns to schooling for migrant workers in China are between 3 and 5 per cent (Cui et al., 2013); (Sakellariou and Fang, 2016). This 3 per cent wage return to education is close to the wage return to education for urban residents in China in 1995 (Cui et al., 2013). Low skill, low-paid jobs taken by migrant workers is one of the main reasons for the low wage return to schooling. Another possible reason is the inferior quality of schooling in rural areas (Fu and Ren, 2010). Cui et al. (2013) argue that some tasks undertaken by migrant workers can be easily substituted by machines, which may provide another reason for low wage rewards to education.

In terms of gender differentials, males have around a 12 per cent higher wage premium than females. There is no wage premium for married workers. Han Chinese have around 10 per cent higher wages than minority groups[129]. The relationship between the logarithmic hourly wage and age is non-linear and the tenure of migrant workers has a U-shaped relationship with logarithmic hourly wage, which all have the expected sign. The returns to tenure increase in the early career stage of migrant workers and achieve the maximum at 23 years of tenure, but there is a decreasing trend with the increase of job tenure thereafter. Migrant workers who worked in the manufacturing and construction industry have around 6 per cent higher wage than migrant workers

[129] Han is the largest ethnic group in China.

working in the service industry.

In addition, there are no wage differentials between public-owned enterprises and non-public-owned enterprises for migrant workers. Due to the government policy, it is very difficult for migrant workers to be employed in state-owned enterprises or urban collective enterprises (Meng, 2001). Thus, there may be not enough observations in public enterprises in the sample. Even when they are hired in SOEs or urban collective enterprises, most of the jobs they occupy are low-end, dirty jobs which urban workers are unwilling to do. Therefore, it is less likely for them to acquire high wages in the public enterprises as urban people who are employed in the public-owned enterprises. Moreover, with the economic reform, there has been a rapid increase of productivity-related wages in the non-public owned enterprises (Cui et al., 2013), which may narrow the wage gap between the public and non-public owned enterprises.

In terms of firm size, as can be seen from Table 4-10, the smallest firm size (less than 5 employees) has about 15 per cent lower wage return than the largest firm size (more than 100 employees). Firms with 6 to 20 employees have around a 6 percent lower wage compared with the largest firm size. The wage setting systems in large firms are more regulated and scientific than small firms, which may make delayed and compressed wage payments less likely to happen. In addition, migrant workers who have job contracts (permanent, long-term and short-term) have higher wages than migrant workers with non-contract temporary and part-time jobs.

One notable result from Table 4-10 model 1 is the high wage returns to training. The wage return to training is around 10 per cent, which is 7 percentage points higher than wage returns to schooling. For migrant workers, obtaining relevant training and skills is more important than education when working in urban areas.

In terms of wage differentials across regions, Guangdong province is selected as the benchmark province in the analysis. Shanghai, the largest financial centre of China, has a similar wage level with the Guangdong province, which is not surprising. The eastern provinces (Jiangsu and Zhejiang) have higher wages than the west (Sichuan) and the middle provinces (Henan, Anhui and Hubei). The western province (Sichuan) has higher wages than the middle provinces[130]. Since the implementation of the "Go West" development policy supported by the government in 1999, the capital of Sichuan province, Chengdu has been the high-tech production center in the southwest region. However, migrant workers in the municipality Chongqing, located in the west, have the lowest wages.

4.6.1.2 Heterogeneous wage returns to education between the old and new generation of migrant workers

A dummy variable to differentiate the old and new generation of migrant workers is added into model 2. As can be seen from Table 4-10 model 2, keeping all else equal, the old generation has around 12 per cent lower wages than the new generation. In order to control for possible differences in the schooling effects on wages between the old generation and new generation of migrant workers, an *old*Schooling* interaction term is added into model 3. According to the results presented in Table 4-10 model 3, it is interesting to see that the return to schooling for the new generation migrant workers is significantly higher than that for the old generation of migrant workers when keeping no generational differences among other variables. The wage return to education in the new generation is 3.46 per cent and the wage return to education in the old generation is 2.48 per cent. The coefficient of dummy variable "Old" becomes insignificant. That is to say, there is no wage differential between the old generation migrant workers and the new generation migrant workers after controlling for the different schooling effects on wage between the old and new generation migrant workers. In addition, coefficients of other independent variables in model 3 have the similar sign, magnitude and statistical significance when compared with the results from model 1.

4.6.1.3 Wage effects of overeducation

After taking educational mismatch into consideration, we can see from the results in Table 4-10 model 4 that the wage return to schooling is 3.71 per cent, which increases by around 23 percent compared to the basic Mincer equation (model 1). Undereducated migrant workers have wage premiums compared to well-matched people who have the same educational level, which is consistent with the literature.

[130] Chengdu is the representative city of Sichuan province in the survey.

However, there is no significant wage effect of overeducation for migrant workers in contrast to earlier findings that there is a negative wage effect of being overeducated (Verdugo and Verdugo, 1989); (Kiker et al., 1997).

Compared to model 2, the new generation of migrant workers still have a higher wage than the old generation of migrant workers even taking educational mismatch into consideration in model 5. Two interaction terms *old*OVER and old*UNDER* are added into Model 6 to control for the possible different wage effects of overeducation and undereducation between the old generation and new generation of migrant workers. As can be seen from Model 6 in Table 4-10, the coefficient of "old" dummy is negative but larger in absolute terms than that of Model 5. In terms of educational mismatch, undereducated migrant workers in the old generation have 11.23 per cent higher wages than undereducated workers in the new generation. There is no apparent difference in the wage effect of overeducation between two generations.

4.6.1.4 Quantile regression results

In this part, quantile regression results are presented at the 10th, 25th, 50th, 75th and 90th of the wage distribution of migrant workers. Table 4-11 reports the wage effects of education across the wage distribution at five quantiles as well as wage returns to schooling from the OLS regression based on the Model 1. As can be seen from the results presented in Table 4-11, along the wage distribution, the return to education increases from 2.10 per cent at the 10th percentile to 3.67 per cent at the 75th percentile (except at the 90th percentile)[131]. Migrant workers enjoy the highest return to education at the 75th percentile. OLS regression indeed provides only part of the picture of wage effects of education for migrant workers. Increasing wage returns to schooling across the wage distribution suggests that education can explain some of the wage inequality among migrant workers to some extent, which is also consistent with the study from Magnani and Zhu (2012).

Table 4-12 describes the quantile regression results taking generational differences into consideration. The wage differentials between the two generations exist in the middle (25th, 50th and 75th) and high end (90th) of the wage distribution. There is no

[131] Not constant coefficients of schooling across quantiles reject the null hypothesis. $F(4, 3276) = 2.95$ ($p=0.0192$).

difference in terms of wage between the two generations at the 10th percentile.

According to the OLS regression results reported in Table 4-10 model 3, the schooling effects on wages between the old and new generation migrant workers are different. However, it is interesting to see that in Table 4-13, schooling effects are higher in the new generation than the old generation at the 10th, 25th and 50th percentiles, i.e. the lower half of the wage distribution[132]. The new generation has a higher return to schooling than the old generation in the lower half of the wage distribution of migrant workers, which indicates that human capital of the new generation migrant workers plays a more important role in the wage determination than that of the old generation migrant workers in the lower half of the wage distribution.

Table 4-14 presents the wage effects of educational mismatch on the conditional wage distribution of migrant workers. In terms of overeducation, quantile regression concurs with the OLS regression analysis at the mean in that there are no wage effects of overeducation among migrant workers across the wage distribution. However, wage premiums of undereducation are mainly concentrated on the low and middle range of the distribution (i.e. 10th, 25th, 50th and 75th). There is no significant impact of undereducation in the high end of the distribution (90th percentile). It seems that undereducation is an important contributor to explore the wage structure of migrant workers at the lower and middle part of the wage distribution. Compared with individuals who have the same educational level but are correctly educated, wage premiums of undereducation are only enjoyed by migrant workers who located at the low and middle end of the distribution of wages.

Comparing Table 4-14 with Table 4-15, we can see that there are still no significant wage effects of overeducation in the wage distribution in Table 4-15. Wage premiums of undereducation are also presented at the 10th, 25th, 50th percentile and 75th percentile, i.e. the low and middle of the wage distribution. This generational difference can not affect the wage effects of over/under-education across the wage

[132] When making analysis of two generations of migrant workers separately (See Table C5 and C6), we can see that wage return to schooling is 1.21 per cent at the 10th percentile, 1.69 per cent at 25th percentile and 2.23 per cent at the 50th percentile in the old generation migrant workers and wage return to schooling is 2.26 per cent, 3.33 per cent at 25th percentile and 3.81 per cent at the 50th percentile in the new generation migrant workers.

distribution.

Table 4-16 describes the differential wage effects of educational mismatch between two generations across the wage distribution. At the middle quantiles (25^{th} and 75^{th}), undereducated migrant workers in the old generation have higher wages than undereducated migrant workers in the new generation. However, at the 90^{th} percentile of the wage distribution, overeducated workers in the old generation have higher wage than overeducated workers in the new generation.

In addition, we consider the wage effects of educational mismatch for the old generation migrant workers and the new generation migrant workers across the wage distribution separately from Table 4-16. The coefficients of overeducation (OVER) and undereducation (UNDER) in the model indicate the wage effects of educational mismatch of the new generation migrant workers. As indicated in Table 4-16, the wage effects of overeducation of the new generation migrant workers are negative across the wage distribution (except at the 25^{th} and 50^{th} percentile). However, they are all insignificant. The coefficients of undereducation of the new generation migrant workers have mixed signs across the distribution but are also insignificant. There are no significant wage effects of educational mismatch for the new generation migrant workers. In terms of the old generation, the wage effects of overeducation in the old generation can be expressed by the coefficients, i.e. φ_1+φ_3 in equation (13). There are no significant wage effects of overeducation of the old generation across the wage distribution. In terms of undereducation, wage premiums of undereducation (φ_2+φ_4 in equation (13)) existed from the 10^{th} percentile to 75^{th} percentile. There is no impact of undereducation on wages of the old generation migrant workers at the top percentile of the wage[133]. Above evidence is not consistent with findings in McGuinness and Bennett (2007) and Budria (2011).

4.6.2 Urban workers

In this section, we explore the wage return to education and wage effects of

[133] The coefficients of (OVER+ OVER*OLD) at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} are -0.013, 0.037, 0.082, 0.068 and 0.088. The coefficients of (UNDER+UNDR*OLD) at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} are 0.132***, 0.092***, 0.125***, 0.149*** and 0.078.

educational mismatch for urban workers. Relevant OLS regression results are reported in Table 4-17. Model 1 in Table 4-17 reports results from the basic Mincer equation. Two dummy variables are included for overeducation and undereducation in Model 2. Quantile regression results are analysed thereafter in Table 4-18 to Table 4-21.

From model 1 in Table 4-17, we can see that the return to education for urban workers is 5.65 per cent, which is slightly lower than that found by Liu and Zhang (2008) [134]. Urban male workers have higher wage premiums than their female counterparts. Married workers have wage premiums than non-married workers. There is a U-shaped relationship between age and wages for urban workers, but only the coefficient of age squared is significant at 10 per cent confidence level. However, the U-shaped relationship between job tenure and wages is significant statistically. The above results may be explained by the positive correlation between age and current job tenure in the urban China (Lu and Song, 2006). In terms of industry, the Agriculture industry has the highest return and finance and business sector has the second highest return compared with the service industry [135]. Individuals working in public-owned enterprises have lower wages than in the non-public owned enterprises, but this result is insignificant. Individuals working in larger firms have higher wages than those in smaller firms. People who have permanent and long term contracts have a wage premiums than non-contract and temporary workers.

After taking educational mismatch into consideration, we can see from Table 4-17 model 2 that overeducation has a significantly negative impact on wages and individuals who are undereducated have wage premiums than individuals who have the same educational level but are correctly educated. These results are consistent with the literature of overeducation and undereducation. Moreover, the returns to education increase to 6.67 per cent, which increases 18 percent from model 1 in Table 4-17. Based on above results, educational mismatch indeed has an important impact on urban workers' wage. In addition, other control variables in Model 2 seem to be similar with Model 1 except the "State" (public-owned enterprises) variable.

[134] Liu and Zhang (2008) find that wage return to education in urban China in 2009 using the Chinese Health and Nutrition Survey (CHNS) is 7.12 per cent. However, they don't control for industry, firm size in the regression, which may yield higher wage return to schooling than this chapter.

[135] In this chapter, about 22 percent of individuals working in the first industry are principals in state agencies, party organisations and enterprises and nearly half of them located in the Guangdong province. Thus, their wages are relatively high.

Next, we move to the results from the quantile regression analysis. Table 4-18 describes quantile regression results based on the basic Mincer equation. The results show that the return to schooling is 6.52 per cent at 90th percentile, which is higher than returns to schooling at the bottom of the wage distribution (5.12 per cent at 10th percentile). There is a monotonic effect of education across the wage distribution. That is to say, education expansion or increasing the educational attainment may accelerate the wage inequality in urban area. Results reported from quantile regression regarding wage returns to education for urban workers echo with the stylized fact in the literature (Buchinsky, 1994); (Machado and Mata, 2001); (Martins and Pereira, 2004).

In terms of educational mismatch in Table 4-19, negative effects of overeducation appear across the wage distribution except the 90th percentile. The positive impact of undereducation on wages can be seen from 25th percentile to 90th percentile. Undereducation doesn't influence individuals' wage at the 10th percentile. Interestingly, wage premiums of undereducation increase monotonically from 25th percentile to 90th percentile.

Table 4-20 and Table 4-21 report the quantile regression results of wage effects of overeducation for urban male workers and urban female workers. For urban male workers, impacts of overeducation on wage present at all five percentiles. There is no wage effect of undereducation only at the very bottom quantile of the wage distribution. For the urban female workers, the negative wage effects of overeducation concentrated at the lower half of the wage distribution (10th, 25th and 50th). However, there is no impact of undereducation on wages for female across the distribution. Different patterns of wage effects of overeducation across the wage distribution by gender indicate that the occupational choices made by female and male workers may be different[136].

4.6.2.1 If the generational division of migrant workers applies to the urban residences, will it be the same picture?

In order to see if this generational division is unique to the migrant workers, we also

[136] Exploring wage effects of educational mismatch by gender is also conducted for rural-to-urban migrant workers. However, there is no significantly different pattern by gender among migrant workers.

split urban workers into two groups: born before Year 1980 and born in and after Year 1980[137]. These two groups of urban residences also experience the economic transition, which is similar with rural-to-urban migrant workers. Table 4-22 reports the differences in the wage effects of schooling between Pre-1980 groups and Post-1980 group. According to Table 4-22 Model 3, the Pre-1980 group has around 18 per cent higher wages than the Post-1980 group but this effect is insignificant. Moreover, there is no significant difference in the return to schooling between these two groups.

Next, in terms of quantile regression as shown in Table 4-23, the wage return to schooling of the pre-1980 group is lower than the Post-1980 group only at the 50th percentile. That is to say, in the middle range of corresponding wage distribution, post-1980 group have higher wage return to schooling than pre-1980 group. Hence, the above results are not similar with those found for migrant workers.

4.7 Discussion

According to the results from section 4.6.1.2, the new generation of migrant workers have a higher wage return to schooling than the old generation of migrant workers. When analysing the new generation and old generation of migrant workers separately, the wage return to education is 3 per cent in the new generation of migrant workers and the return to schooling for the old generation migrant workers is 2.4 per cent (see Table C5 and C6 in the appendix). We speculate that the improved rural educational attainment and school quality along with the relaxed restrictions on migrant workers entering the urban labour market may have led to the higher wage return to schooling for the new generation of migrant workers.

Based on a distributional analysis (section 4.6.1.4), the new generation of migrant workers have higher wage effects of schooling over the old generation migrant workers in the low and middle part of the wage distribution (10th, 25th and 50th percentile). Although the in-depth analysis of the wage structure between the old and

[137] 4929 observations are in the Pre-1980 groups, 992 observations in the Post-1980 groups. Fewer individuals in the post-1980 group are a result of the One Child policy in China. Due to the small number of observations for undereducated urban workers in the Post-1980 groups, this chapter only explores the wage return to schooling between these two groups.

new generation of migrant workers is beyond the scope of this thesis[138], we infer that different industry composition structure across these two generations may have led to such disparity of wage returns to schooling in the wage distribution. If we further analyse the detailed composition of industries in the wage distribution, we can see that there is a manifest difference in the percentage of individuals working in the manufacturing and construction and service sectors between the old and new generation migrant workers in the wage distribution (see Table C3 in the appendix). More specifically, a shift from manufacturing and construction industry to service sectors (wholesale and retail trade, hotel and catering and other service) between two generations may lead to different wage effects of schooling. In the *China's 11th Five-Year Plan (2006-2011)*, the government would give priority to the development of service industry in order to upgrade the industrial structure[139]. Enhancing the development of service sectors and increasing the employment in the service sectors is also an important goal set in the *China's 12th Five-Year Plan (2011-2015)*[140]. Thus, the shift from manufacturing and construction to service sectors is a result of government-oriented policy.

In addition, different occupational choices made by these two generations may play an important part to explain the different industry structure between two generations. According to the RUMIC migrant survey 2009, about 70.10 per cent of new generation migrant workers studied in school before they came to the urban labour market. While in the old generation migrant workers, approximately 62.65 per cent farmed before they entered the urban labour market[141]. This generational difference may affect their occupational choices and career aspirations. Schooling may help the new generation migrant workers form higher standards and expectations about their jobs before coming to the urban labour market than old generation. They may prefer to find better working conditions and be more concerned about their career plans than the old generation migrant workers (Wang et al., 2013)[142]. The old generation migrant workers came to cities only for making a living or getting a new way for income

[138] Many scholars employ the decomposition technique to analysis the wage differentials between groups (Knight and Song, 2003); (Zhu, 2016).
[139] http://en.ndrc.gov.cn/newsrelease/200603/t20060323_63813.html
[140] http://www.kpmg.com/cn/en/issuesandinsights/articlespublications/publicationseries/5-years-plan/pages/default.aspx .
[141] In RUMIC Migrant survey, there is a question: "what did you do before you migrated out for the first time?"
[142] Therefore, new generation migrant workers are more willing to settle down in cities permanently.

(Wang, 2008). Jobs in construction sector are dangerous and dirty but are highly rewarded. Therefore, the old generation migrant workers prefer to work in the construction sector to earn high earnings. The above arguments may provide an explanation why there is a shift from manufacturing and construction industries towards the service sector between two generations.

In this chapter, the wage return to schooling of migrant workers (around 3 per cent) is lower than that of urban residents (6 per cent), which has also been confirmed by many scholars (Démurger et al., 2009); (Zhu, 2016). Segmented labour marker caused by the Household Registration System (*Hukou*) is the main cause to explain the disparity of wage return to schooling between urban residents and migrant workers. In terms of educational mismatch, different wage effects of educational mismatch between urban residents and rural migrant workers are presented, which support the notion of the two-tier labour market in urban China (Meng and Zhang, 2001). The wage effects of educational mismatch for urban workers are consistent with the existing literature. However for migrant workers, overeducation doesn't exhibit negative wage effects. Even if exploring across the wage distribution, the result still holds. The wage premiums enjoyed by undereducated migrant workers are only present in the lower and middle part of the wage distribution. One reason behind the different wage effects of educational mismatch between urban residents and migrant workers may be that the educational level, an indicator of productivity, fails to take its function in the process of job-occupation match of rural-to-urban migrant workers in the urban labour market. According to the 2009 RUMiC Migrant Survey employed in this chapter, nearly 70 per cent of migrants get secure jobs through the family members, relatives and friends[143]. That is to say, most of the job-occupation match of migrant workers is not through the market mechanism. Although this informal job search channel can help to overcome the imperfect information and reduce the unemployment rate to some extent, the efficient education-job match process has been hindered and thus the wage effects of educational mismatch exhibit different patterns compared to urban residents.

[143] In RUMiC survey 2009, there is a question regarding job-seeking channels, "how did you get you first job?".

On the other hand, most jobs undertaken by migrant workers require proficiency, are paid by piecework and do not need high education[144]. Instead, skills and relevant work experience are more related to wages than educational level for migrant workers. Higher returns to training than the return to schooling of migrant workers and positive wage premiums of undereducation in this chapter also confirm this point of view (See Table 4-10 model 1 and model 4). Both old and new generations of migrant workers have finished their education before entering the urban labour market. The most direct way to improve individual's employability related to the urban labour market is to receive training. Therefore, it is easy to understand the insignificant wage effects of overeducation for migrant workers.

In terms of sample selection results, the coefficients on the inverse mills ratios are significantly negative in Model 1 and Model 3, as shown in both Tables C7 and C8 in the appendix. Therefore, sample selection is apparent in Model 1 and Model 3 in both the migrant sample and the urban sample. Negative coefficients on the inverse mills ratios indicate that OLS yields downward estimation of wage returns to education. However, in terms of the migrant sample, compared wage returns to education in Table 4-10 Model 1 (3.02 per cent) (without controlling for sample selection) with wage returns to education in Table C 7 Model 1 (3.08 per cent) (controlling for sample bias), results are similar. The urban sample has the same case. Base on above evidence, taking sample selection into consideration does not greatly influence the results found in this chapter.

4.8 Conclusion

Based on above results, the following conclusions are obtained in this chapter:

(1) According to the OLS regression, the wage return to schooling for migrant workers is around 3 per cent. Taking the heterogeneity of migrant workers into consideration, the new generation migrant workers have slightly higher (1 percentage point) wage return to schooling than the old generation of migrant workers. When using a distributional analysis, the new generation of migrant workers have higher wage

[144] See Table C1.

effects of schooling than that of old generation of migrant workers in the low and middle part of the wage distribution (i.e. 10^{th}, 25^{th} and 50^{th} percentiles).

(2) In terms of educational mismatch, there is no significant wage effect of overeducation for migrant workers, while positive wage premiums of undereductaion can be enjoyed by migrant workers. According to the results from quantile regression, at the middle quantiles (25^{th} and 75^{th}), undereducated migrant workers in the old generation enjoy higher wage returns than undereducated migrant workers in the new generation. However, at the 90^{th} percentile of the wage distribution, overeducated workers in the old generation have higher wage than overeducated workers in the new generation.

(3) For urban residents, the wage return to education is around 6 per cent based on the OLS regression, which is 3 percentage points higher than for migrant workers. Additionally, wage penalties of overeducation are significant in the low and middle quantiles of the wage distribution (from 10^{th} to 75^{th}). Wage premiums of undereducation increase from 25^{th} percentile to 90^{th} percentile of the wage distribution.

Although the wage return to education is quite low for migrant workers compared to the urban workers in this chapter, it doesn't mean education is not important for migrant workers. On the contrary, it is good to see in this chapter that the new generation of migrant workers have a higher wage return to schooling than the old generation of migrant workers, which indicates that the quality of rural human capital is improving. Additionally, the relaxation of urban labour market policies have helped migrant workers better integrate into the urban labour market, again increasing the purpose of education. On one hand, due to the one-child policy, the shrinking trend in the growth rate of working aged urban population has emerged. On the other hand, the rural population accounts for 70 percent of the whole population in China (Meng, 2012). Thus, we can infer that the future labour force will mainly come from the rural area. If this is the case, the overall level of human capital in China will be determined by the human capital of rural labour force.

Given the above evidence, on one hand, the government should put more investment on rural education to increase the overall level of human capital in order to facilitate the economic growth and the urbanisation process in the future. On the other hand, although the government has made some efforts to change migrant workers' situation recent years to help them better integrate into the urban area, such as the relaxation of the hukou system in small and medium cities and urban housing programmes (Wang et al., 2013), more policies have to be implemented to make rural migrant workers enjoy equal rights with urban residents. For example, the government should provide a comprehensive welfare system including basic medical insurance and pension program to migrant workers and also allow the children of migrant workers to go to the public school in the urban area to enjoy same quality of schooling with children from urban area.

In this chapter, the wage effect of educational mismatch for migrant workers is not consistent with urban residents. One reason may be the informal job search channel. In order to improve the job-education match of migrant workers, the government should provide more official employment service, such as build official job agency exclusively for migrant workers, to guide migrant workers to find jobs that match their educational levels or skill levels to realise the value of education and their career aspirations, especially for new generation migrant workers. In addition, commercial job agency should enhance the cooperation with enterprises to reflect comprehensive and timely job vacancies from the labour market and at the same time convey scientific recruitment criteria to migrant workers to help them establish rational career path. A second reason may be that skills and relevant working experiences are more related to migrants' wages than educational level regarding jobs taken by migrant workers. The Chinese government has already implemented the "The National Plan of Training Rural migrants in 2003-2010" in 2003, the "Sunshine Project" in 2004 and "The Spring Wind Action" in 2008 programmes providing migrant workers introductory training to help them look for jobs in urban area. However, as more migrant workers surge into the cities, the coverage rate of training needs to be improved (Zhan, 2005). Therefore, the government needs to adopt multiple channels to provide training schemes for migrant workers. Not only relying on basic training programmes in the urban area, the local government in the rural area should also participate to provide related training to migrant workers before they come to the cities in order to enhance migrant workers' competitiveness and job search efficiency. In terms of return migrants, the local government also needs to establish relevant institutions, such as retraining centre or training centre in community, to provide vocational education and training to return migrants who have at least junior middle school education to improve their employability. In addition, the government should provide various types of financial support, such as government subsidy, to enterprises to encourage them providing job-specific training to migrant workers to improve their productivities.

With migrant workers' better integration into the urban labour market in the future, the pattern of wage effects of overeducation for urban residents may appear in the migrant groups. However, based on the results in this chapter, negative wage effects of overeducation seem to be overlooked for migrant workers.

In addition, we are still unclear whether there are other effects of educational mismatch among rural-to-urban migrant workers in China. For example, will educational mismatch influence the return decision of migrant workers? Or will educational mismatch detriment well-being of rural-to-urban migrant workers? All these questions need to be further investigated in the future.

Table 4-1 Summary statistics (Rural-to-Urban migrant workers)

	Rural-to-urban migrants sample				The old generation				The new generation			
Dependent variable	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**
Log hourly wage	1.891	0.487	0.069	4.317	1.894	0.481	0.397	3.807	1.888	0.491	0.069	4.317
Independent variables												
Years of schooling	9.387	2.886	0	17	8.246	3.171	0	16	10.220	2.329	0	17
Training	0.273	0.446	0	1	0.228	0.420	0	1	0.306	0.461	0	1
Overeducated	0.167	0.373	0	1	0.095	0.294	0	1	0.219	0.414	0	1
Undereducated	0.121	0.326	0	1	0.231	0.422	0	1	0.041	0.198	0	1
Age	29.972	10.031	16	60	39.882	7.346	30	60	22.736	3.255	16	29
Age^2	998.896	694.732	256	3600	1644.524	625.6638	900	3600	527.53	150.631	256	841
Male	0.594	0.491	0	1	0.609	0.488	0	1	0.584	0.493	0	1
Married	0.500	0.500	0	1	0.887	0.317	0	1	0.218	0.413	0	1
Ethnicity	0.986	0.116	0	1	0.985	0.122	0	1	0.987	0.111	0	1
Tenure of current job	3.039	3.910	0	38	4.777	5.096	0	38	1.771	1.918	0	13
Tenure squared	24.520	73.640	0	1444	48.772	107.355	0	1444	6.813	15.104	0	169
Industry (reference group: Service)												
Agriculture, forestry and animal husbandry	0.001	0.025	0	1	0.001	0.027	0	1	0.001	0.023	0	1
Manufacture, production and construction	0. 373	0.484	0	1	0.439	0.496	0	1	0.325	0.469	0	1
Information Transmission and Transportation	0.035	0.185	0	1	0.045	0.206	0	1	0.029	0.167	0	1
Finance and Business	0.077	0.266	0	1	0.080	0.271	0	1	0.074	0.263	0	1
Public	0.078	0.269	0	1	0.111	0.315	0	1	0.055	0.227	0	1
Service	0.436	0.496	0	1	0.325	0.469	0	1	0.516	0.500	0	1
Occupation												
Administrative staff and manager	0.248	0.432	0	1	0.254	0.436	0	1	0.243	0.429	0	1
Businessman/commercial staff	0.136	0.343	0	1	0.093	0.291	0	1	0.167	0.373	0	1
Service personnel	0.310	0.463	0	1	0.299	0.458	0	1	0.319	0.466	0	1
Manufacture and transportation worker	0.306	0.461	0	1	0.354	0.478	0	1	0.271	0.445	0	1
Ownership (reference group: non-public enterprises)												
Public enterprises	0.156	0.363	0	1	0.205	0.404	0	1	0.121	0.326	0	1
Firm size (reference group: Firm size 4)												
Firm size 1(1 to 5 employees)	0.096	0.295	0	1	0.080	0.272	0	1	0.107	0.310	0	1
Firm size 2 (6 to 20 employees)	0.208	0.406	0	1	0.197	0.398	0	1	0.215	0.411	0	1
Firm size 3 (21 to 99 employees)	0.321	0.467	0	1	0.322	0.467	0	1	0.320	0.466	0	1
Firm size 4 (100 and over employees)	0.376	0.484	0	1	0.401	0.490	0	1	0.358	0.480	0	1
Job type (reference group: Others)												
Permanent	0.136	0.343	0	1	0.126	0.332	0	1	0.144	0.351	0	1
Long term (one year and above)	0.421	0.494	0	1	0.425	0.495	0	1	0.418	0.493	0	1
Short term (less than one year)	0.125	0.331	0	1	0.112	0.315	0	1	0.134	0.341	0	1
Others	0.318	0.466	0	1	0.337	0.473	0	1	0.303	0.460	0	1
Province (reference group: Guangdong)												
Guangdong	0.232	0.422	0	1	0.227	0.419	0	1	0.235	0.424	0	1
Henan	0.069	0.253	0	1	0.053	0.224	0	1	0.080	0.272	0	1
Anhui	0.081	0.273	0	1	0.062	0.242	0	1	0.094	0.292	0	1
Chongqing	0.083	0.276	0	1	0.098	0.298	0	1	0.072	0.258	0	1
Shanghai	0.079	0.270	0	1	0.090	0.287	0	1	0.071	0.257	0	1
Jiangsu	0.145	0.352	0	1	0.154	0.361	0	1	0.138	0.345	0	1
Zhejiang	0.151	0.359	0	1	0.148	0.356	0	1	0.154	0.361	0	1
Hubei	0.080	0.272	0	1	0.090	0.287	0	1	0.073	0.260	0	1
Sichuan	0.080	0.271	0	1	0.076	0.265	0	1	0.082	0.275	0	1
Total	3301				1393				1908			

Table 4-2 Summary statistics (Urban workers)

Variables	Urban			
Dependent variable	**Mean**	**SD**	**Min**	**Max**
Log hourly wage	2.517	0.739	0.041	6.442
Independent variables				
Years of schooling	12.505	3.253	1	35
Overeducated	0.107	0.309	0	1
Undereducated	0.125	0.331	0	1
Age	40.487	9.754	18	60
Age squared	1734.296	792.810	324	3600
Male	0.559	0.497	0	1
Married	0.836	0.370	0	1
Ethnicity	0.990	0.098	0	1
Tenure of current job	13.002	10.891	0	45
Tenure squared	287.643	389.373	0	2025
Industry (reference group: Service)				
Agriculture, forestry and animal husbandry	0.007	0.086	0	1
Manufacture, production and construction	0.261	0.439	0	1
Transportation and Information	0.137	0.344	0	1
Finance and Business	0.095	0.293	0	1
Public	0.259	0.438	0	1
Service	0.240	0.427	0	1
Occupation				
Principals in State Agencies, Party organisations	0.059	0.235	0	1
Professional technicians	0.242	0.428	0	1
Clerk and relating personnel	0.268	0.443	0	1
Commercial and service personnel	0.205	0.404	0	1
Manufacturing and transporting equipment	0.157	0.363	0	1
Agriculture, Forestry, Animal Husbandry, Soldier and other practitioner (difficult to classify)	0.070	0.255	0	1
Ownership (reference group): non-public enterprises)				
Public enterprises	0.649	0.477	0	1
Firm size (reference group: Firm size 4)				
Firm size 1(1 to 5 employees)	0.049	0.216	0	1
Firm size 2 (6 to 20 employees)	0.169	0.375	0	1
Firm size 3 (21 to 99 employees)	0.287	0.452	0	1
Firm size 4 (100 and over employees)	0.495	0.500	0	1
Job type (reference group: Others)				
Permanent	0.340	0.474	0	1
Long term contract (one year and above)	0.500	0.500	0	1
Short term contract (less than one year)	0.042	0.201	0	1
Others	0.118	0.322	0	1
Province (reference group: Guangdong)				
Guangdong	0.152	0.359	0	1
Henan	0.113	0.317	0	1
Anhui	0.110	0.313	0	1
Chongqing	0.079	0.270	0	1
Shanghai	0.124	0.329	0	1
Jiangsu	0.112	0.315	0	1
Zhejiang	0.109	0.311	0	1
Hubei	0.084	0.277	0	1
Sichuan	0.118	0.322	0	1
Total	5921			

Table 4-3 Wage distribution and wage inequality between migrant workers and urban residents

Hourly wage (Yuan)	**Rural to urban migrant workers**	**The urban sample**
Mean	7.485	17.256
5th percentile	3.036	4.063
10th percentile	3.571	5
25th percentile	4.762	7.5
50th percentile	6.667	12.5
75th percentile	9.115	18.75
90th percentile	12.5	31.25
95th percentile	15	41.25
Ratio of 90th to 10th percentile	3.500	6.250
Ratio of 90th to 50th percentile	1.875	2.500
Ratio of 50th to 10th percentile	1.867	2.500
Total number of observations	3301	5921

Table 4-4 Average years of schooling and highest educational level

Variables	**Full migrant sample**	**Urban residents**
Average years of schooling	9.387	12.505
Highest educational level		
Primary or less	397 (12.03%)	112 (1.89%)
Junior middle school	1614 (48.89%)	947 (15.99%)
Senior middle school	653 (19.78%)	1491 (25.18%)
Vocational school	402 (12.18%)	626 (10.57%)
College/Undergraduate or higher	235 (7.12%)	2745 (46.36%)
Total	3301	5921

Table 4-5 Occupations (migrant workers versus urban workers)

Occupations	**The old generation of migrant workers**	**The new generation of migrant workers**	**Occupations**	**Urban residents**
			Principals in State Agencies, Party organisations	347 (5.86%)
			Professional technicians	1433 (24.20%)
Administrative staff and manager	354 (25.41%)	464 (24.32%)	Clerk and relating personnel	1585 (26.77%)
Businessman/commercial staff	130 (9.33%)	318 (16.67%)	Commercial and service personnel	1214 (20.50%)
Service personnel	416 (29.86%)	608 (31.87%)	Manufacturing and transporting equipment	927 (15.66%)
Manufacture and transportation worker	493 (35.39%)	518 (27.15%)	Agriculture, Forestry, Animal Husbandry and other practitioner(difficult to classify)[145]	415 (7.01%)
Total	1393 (42.20%)	1908 (57.80%)		5921

[145] Due to few observations in Agriculture, Forestry, Animal Husbandry (42 observations in urban full sample) and Soldier (39 observations in urban full sample), I combine “Agriculture, Forestry, Animal Husbandry and “Soldier” into “Other practitioner” category according to the Chinese Dictionary of Occupation Classification.

Table 4-6 Working hours a week

Working hours a week	The old generation	The new generation	Migrant sample	Urban sample
44 and below[146]	194 (13.93%)	275 (14.41%)	469 (14.21%)	4207 (71.05%)
45 to 60	739 (53.05%)	1069 (56.03%)	1808 (54.77%)	1569 (26.50%)
61 to 80	334 (23.98%)	399 (20.91%)	733 (22.21%)	117 (1.98%)
Above 80	126 (9.05%)	165 (8.65%)	291 (8.82%)	28 (0.47%)
Average working hours a week	57.47	56.99	57.19	42.40
Total	1393 (100%)	1908 (100%)	3301 (100.00%)	5921 (100.00%)

Table 4-7 Regional distribution (Migrant workers)

Region	The old generation of migrant workers	The new generation of migrant workers	Migrant sample
East	863 (61.95%)	1142 (59.85%)	2005 (60.74%)
Middle	287 (20.60%)	472 (24.74%)	759 (22.99%)
West	243 (17.44%)	294 (15.41%)	537 (16.27%)
Total	1393	1908	3301

Table 4-8 Educational mismatch (Migrant workers versus urban workers)

Variables	The old generation of migrant workers	The new generation of migrant workers	Migrant sample	Urban sample
Overeducated	133 (9.55%)	418 (21.91%)	551(16.69%)	635 (10.72%)
Correctly educated	938 (67.34%)	1412 (74.00%)	2350 (71.19%)	4543 (76.73%)
Undereducated	322 (23.12%)	78 (4.09%)	400 (12.12%)	743 (12.55%)
Total	1393	1908	3301	5921

[146] According to the Labour Law of the People's Republic of China, the legal working hour is 8 hours a day and maximum 44 hours a week in China.

Table 4-9 Educational mismatch by wage quantiles

(Migrant workers versus urban workers)

Percentile	**Urban residents**			**Migrant workers**		
	Undereducation	Correct education	Overeducation	Undereducation	Correct education	Overeducation
$0\sim10^{th}$	124 (20.06%)	465 (75.24%)	29 (4.69%)	69 (18.25%)	262 (69.31%)	47 (12.43%)
$10^{th}\sim25^{th}$	157 (16.83%)	693 (74.28%)	83 (8.90%)	87 (19.16%)	317 (69.82%)	50 (11.01%)
$25^{th}\sim50^{th}$	216 (13.09%)	1266 (76.73%)	168 (10.18%)	102 (12.33%)	618 (74.73%)	107 (12.94%)
$50^{th}\sim75^{th}$	132 (10.64%)	956 (77.03%)	153 (12.33%)	88 (10.77%)	600 (73.44%)	129 (15.79%)
$75^{th}\sim90^{th}$	67 (7.12%)	750 (79.70%)	124 (13.18%)	44 (8.12%)	365 (67.34%)	133 (24.54%)
$90^{th}\sim100^{th}$	47 (8.74%)	413 (76.77%)	78 (14.50%)	10 (3.53%)	188 (66.43%)	85 (30.04%)
Total	743 (12.55%)	4543 (76.73%)	635 (10.72%)	400 (12.12%)	2350 (71.19%)	551 (16.69%)

Table 4-10 Multivariate regression for rural-to-urban migrant workers

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Years of schooling	0.0302***	0.0291***	0.0346***	0.0371***	0.0359***	0.0363***
	(0.0028)	(0.0028)	(0.0041)	(0.0047)	(0.0047)	(0.0047)
Old		-0.1208***	-0.0226		-0.1172***	-0.1378***
		(0.0306)	(0.0624)		(0.0307)	(0.0322)
Old*Schooling			-0.0098*			
			(0.0054)			
OVER				0.0007	-0.0020	-0.0205
				(0.0262)	(0.0261)	(0.0285)
UNDER				0.0927***	0.0891***	0.0083
				(0.0332)	(0.0331)	(0.0517)
Old*OVER						0.0587
						(0.0440)
Old*UNDER						0.1123**
						(0.0545)
Training	0.0966***	0.0955***	0.0960***	0.0957***	0.0946***	0.0949***
	(0.0167)	(0.0166)	(0.0166)	(0.0167)	(0.0166)	(0.0166)
Male	0.1271***	0.1260***	0.1283***	0.1301***	0.1289***	0.1287***
	(0.0153)	(0.0153)	(0.0153)	(0.0153)	(0.0153)	(0.0153)
Married	-0.0015	0.0026	0.0076	0.0021	0.0059	0.0063
	(0.0212)	(0.0211)	(0.0213)	(0.0212)	(0.0212)	(0.0212)
Ethnicity	0.1040*	0.1034*	0.1031*	0.1073*	0.1064*	0.1002
	(0.0611)	(0.0609)	(0.0609)	(0.0610)	(0.0609)	(0.0609)
age	0.0478***	0.0617***	0.0608***	0.0472***	0.0608***	0.0620***
	(0.0056)	(0.0066)	(0.0066)	(0.0056)	(0.0066)	(0.0066)
age^2	-0.0007***	-0.0009***	-0.0008***	-0.0007***	-0.0008***	-0.0009***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0328***	0.0334***	0.0339***	0.0331***	0.0336***	0.0338***
	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0042)
Tenure squared	-0.0007***	-0.0007***	-0.0007***	-0.0007***	-0.0007***	-0.0007***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
State	0.0113	0.0145	0.0149	0.0119	0.0150	0.0149
	(0.0207)	(0.0206)	(0.0206)	(0.0206)	(0.0206)	(0.0206)
Agriculture, forestry and animal husbandry	-0.0141	-0.0237	-0.0442	-0.0578	-0.0647	-0.0679
	(0.2868)	(0.2862)	(0.2863)	(0.2869)	(0.2863)	(0.2862)
Manufacture, production and construction	0.0567***	0.0556***	0.0562***	0.0551***	0.0543***	0.0552***
	(0.0188)	(0.0188)	(0.0188)	(0.0189)	(0.0188)	(0.0188)
Information Transmission and Transportation	0.0430	0.0427	0.0420	0.0443	0.0441	0.0455
	(0.0399)	(0.0398)	(0.0398)	(0.0399)	(0.0398)	(0.0398)
Finance and Business	0.0025	0.0051	0.0058	-0.0011	0.0014	0.0014
	(0.0287)	(0.0286)	(0.0286)	(0.0288)	(0.0287)	(0.0287)
Public	-0.0388	-0.0410	-0.0409	-0.0386	-0.0407	-0.0380
	(0.0290)	(0.0289)	(0.0289)	(0.0290)	(0.0289)	(0.0289)
Firm size 1 (1 to 5 employees)	-0.1483***	-0.1480***	-0.1460***	-0.1486***	-0.1485***	-0.1492***
	(0.0282)	(0.0281)	(0.0281)	(0.0282)	(0.0281)	(0.0281)
Firm size 2 (6 to 20 employees)	-0.0594***	-0.0604***	-0.0588***	-0.0604***	-0.0614***	-0.0626***
	(0.0219)	(0.0218)	(0.0218)	(0.0218)	(0.0218)	(0.0218)
Firm size 3 (21 to 99 employees)	0.0105	0.0096	0.0103	0.0117	0.0107	0.0095
	(0.0183)	(0.0183)	(0.0183)	(0.0183)	(0.0183)	(0.0183)
Permanent	0.0585**	0.0561**	0.0557**	0.0585**	0.0562**	0.0560**
	(0.0238)	(0.0238)	(0.0237)	(0.0238)	(0.0237)	(0.0237)
Long term	0.1056***	0.1047***	0.1039***	0.1062***	0.1053***	0.1047***
	(0.0186)	(0.0186)	(0.0186)	(0.0186)	(0.0186)	(0.0186)
Short term	0.0543**	0.0545**	0.0543**	0.0562**	0.0562**	0.0571**
	(0.0247)	(0.0246)	(0.0246)	(0.0246)	(0.0246)	(0.0246)
Henan	-0.3462***	-0.3464***	-0.3460***	-0.3419***	-0.3423***	-0.3424***
	(0.0317)	(0.0317)	(0.0317)	(0.0317)	(0.0317)	(0.0317)
Anhui	-0.3379***	-0.3407***	-0.3429***	-0.3373***	-0.3399***	-0.3390***
	(0.0299)	(0.0299)	(0.0299)	(0.0299)	(0.0299)	(0.0299)
Chongqing	-0.3925***	-0.3908***	-0.3911***	-0.3899***	-0.3883***	-0.3871***
	(0.0293)	(0.0292)	(0.0292)	(0.0293)	(0.0292)	(0.0292)
Shanghai	-0.0239	-0.0248	-0.0262	-0.0231	-0.0239	-0.0233
	(0.0297)	(0.0297)	(0.0297)	(0.0297)	(0.0297)	(0.0297)
Jiangsu	-0.0913***	-0.0921***	-0.0948***	-0.0922***	-0.0927***	-0.0916***
	(0.0246)	(0.0246)	(0.0246)	(0.0247)	(0.0246)	(0.0246)
Zhejiang	-0.0982***	-0.0989***	-0.0993***	-0.0955***	-0.0962***	-0.0958***
	(0.0239)	(0.0238)	(0.0238)	(0.0239)	(0.0239)	(0.0239)
Hubei	-0.3447***	-0.3421***	-0.3411***	-0.3442***	-0.3418***	-0.3396***
	(0.0293)	(0.0292)	(0.0292)	(0.0292)	(0.0292)	(0.0292)
Sichuan	-0.1638***	-0.1616***	-0.1636***	-0.1699***	-0.1670***	-0.1659***
	(0.0303)	(0.0303)	(0.0303)	(0.0306)	(0.0305)	(0.0305)
Constant	0.7040***	0.4819***	0.4416***	0.6358***	0.4213***	0.4120***
	(0.1119)	(0.1251)	(0.1270)	(0.1172)	(0.1297)	(0.1297)
Observations	3301	3301	3301	3301	3301	3301
R^2	0.3167	0.3199	0.3206	0.3186	0.3216	0.3228

*** p<0.10, ** p<0.05, *** p<0.010**

Note: 1. (1) Service industry is the benchmark industry; (2) Firm size above 100 employees is the bench mark group; (3) Others (non-contract temporary job, part-time job and others) is the benchmark job type; (4) Guangdong is the benchmark province; (5) Non-public is the benchmark work unit type.

Table 4-11 OLS VS QR Model 1for migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0302***	0.0210***	0.0258***	0.0318***	0.0367***	0.0363***
	(0.0028)	(0.0038)	(0.0040)	(0.0036)	(0.0035)	(0.0042)
Training	0.0966***	0.103***	0.107***	0.0854***	0.113***	0.0784***
	(0.0167)	(0.0264)	(0.0213)	(0.0207)	(0.0216)	(0.0246)
male	0.127***	0.0976***	0.0956***	0.127***	0.153***	0.153***
	(0.0153)	(0.0221)	(0.0207)	(0.0173)	(0.0204)	(0.0248)
Married	-0.00146	-0.00593	0.0290	0.0191	0.0000982	0.0244
	(0.0212)	(0.0361)	(0.0293)	(0.0290)	(0.0284)	(0.0364)
Ethnicity	0.104*	0.0766	0.170*	0.0841	0.0962	0.0713
	(0.0611)	(0.1010)	(0.0953)	(0.0711)	(0.1081)	(0.1473)
Age	0.0478***	0.0538***	0.0447***	0.0388***	0.0433***	0.0410***
	(0.0056)	(0.0089)	(0.0083)	(0.0067)	(0.0071)	(0.0092)
age^2	-0.000719***	-0.000812***	-0.000696***	-0.000603***	-0.000663***	-0.000608***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0328***	0.0192***	0.0221***	0.0317***	0.0461***	0.0483***
	(0.0042)	(0.0062)	(0.0055)	(0.0053)	(0.0058)	(0.0080)
Tenure squared	-0.000718***	-0.000250	-0.000259	-0.000659***	-0.00119***	-0.00124***
	(0.0002)	(0.0004)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Agriculture, forestry and animal husbandry	-0.0141	0.414**	0.266***	0.0478	-0.187*	-0.470***
	(0.2868)	(0.1613)	(0.1022)	(0.0630)	(0.1103)	(0.1769)
Manufacture, production and construction	0.0567***	0.0688**	0.0421	0.0721***	0.0513**	0.0353
	(0.0188)	(0.0288)	(0.0267)	(0.0221)	(0.0249)	(0.0314)
Information Transmission and Transportation	0.0430	0.0804	0.108**	0.0294	0.0246	0.00628
	(0.0399)	(0.0512)	(0.0541)	(0.0522)	(0.0528)	(0.0754)
Finance and Business	0.00249	-0.00880	0.0388	0.0173	-0.0346	-0.0179
	(0.0287)	(0.0569)	(0.0387)	(0.0323)	(0.0380)	(0.0455)
Public	-0.0388	-0.0977*	-0.0200	-0.0193	-0.0591	-0.0615
	(0.0290)	(0.0575)	(0.0405)	(0.0331)	(0.0371)	(0.0518)
State	0.0113	0.00621	-0.00978	0.0201	0.0176	0.0346
	(0.0207)	(0.0370)	(0.0287)	(0.0267)	(0.0270)	(0.0341)
Firm size 1 (1 to 5 employees)	-0.148***	-0.166***	-0.201***	-0.149***	-0.147***	-0.130**
	(0.0282)	(0.0467)	(0.0387)	(0.0365)	(0.0348)	(0.0556)
Firm size 2 (6 to 20 employees)	-0.0594***	-0.0199	-0.0563**	-0.0748**	-0.0652**	-0.0664*
	(0.0219)	(0.0340)	(0.0271)	(0.0303)	(0.0312)	(0.0372)
Firm size 3 (21 to 99 employees)	0.0105	0.0367	0.0158	0.00455	0.000573	-0.000490
	(0.0183)	(0.0283)	(0.0280)	(0.0207)	(0.0228)	(0.0279)
Permanent	0.0585**	0.0718**	0.0344	0.0626**	0.0442	0.0565
	(0.0238)	(0.0358)	(0.0324)	(0.0305)	(0.0288)	(0.0449)
Long term	0.106***	0.126***	0.131***	0.119***	0.0685**	0.0862***
	(0.0186)	(0.0296)	(0.0243)	(0.0226)	(0.0279)	(0.0310)
Short term	0.0543**	0.0919***	0.0465	0.0521*	-0.0139	0.0564
	(0.0247)	(0.0351)	(0.0306)	(0.0271)	(0.0335)	(0.0418)
Henan	-0.346***	-0.397***	-0.380***	-0.328***	-0.295***	-0.324***
	(0.0317)	(0.0661)	(0.0422)	(0.0448)	(0.0459)	(0.0443)
Anhui	-0.338***	-0.404***	-0.332***	-0.340***	-0.321***	-0.358***
	(0.0299)	(0.0480)	(0.0428)	(0.0393)	(0.0382)	(0.0497)
Chongqing	-0.393***	-0.386***	-0.373***	-0.421***	-0.409***	-0.406***
	(0.0293)	(0.0427)	(0.0333)	(0.0316)	(0.0422)	(0.0555)
Shanghai	-0.0239	-0.0456	-0.0385	0.0115	0.0246	-0.0705
	(0.0297)	(0.0531)	(0.0349)	(0.0384)	(0.0331)	(0.0548)
Jiangsu	-0.0913***	-0.114***	-0.0412	-0.0801***	-0.0995***	-0.148***
	(0.0246)	(0.0369)	(0.0319)	(0.0275)	(0.0326)	(0.0401)
Zhejiang	-0.0982***	-0.0872**	-0.0810***	-0.0921***	-0.0863***	-0.151***
	(0.0239)	(0.0357)	(0.0295)	(0.0335)	(0.0321)	(0.0348)
Hubei	-0.345***	-0.357***	-0.355***	-0.345***	-0.335***	-0.297***
	(0.0293)	(0.0342)	(0.0343)	(0.0343)	(0.0407)	(0.0585)
Sichuan	-0.164***	-0.265***	-0.171***	-0.109***	-0.155***	-0.161***
	(0.0303)	(0.0447)	(0.0519)	(0.0359)	(0.0470)	(0.0416)
Constant	0.704***	0.278	0.493***	0.833***	0.962***	1.235***
	(0.1119)	(0.1801)	(0.1728)	(0.1388)	(0.1627)	(0.2060)
Observations	3301	3301	3301	3301	3301	3301
R^2	0.317					

Note: 1. A bootstrap method is adopted to calculate standard errors in quantile regression.

Table 4-12 OLS VS QR Model 2 for migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0291***	0.0202***	0.0249***	0.0317***	0.0364***	0.0343***
	(0.0028)	(0.0040)	(0.0040)	(0.0037)	(0.0035)	(0.0045)
Old	-0.121***	-0.0624	-0.117***	-0.113***	-0.101**	-0.191***
	(0.0306)	(0.0482)	(0.0412)	(0.0426)	(0.0418)	(0.0509)
Training	0.0955***	0.0986***	0.0991***	0.0836***	0.116***	0.0631***
	(0.0166)	(0.0271)	(0.0210)	(0.0206)	(0.0217)	(0.0237)
male	0.126***	0.0923***	0.0951***	0.129***	0.147***	0.148***
	(0.0153)	(0.0233)	(0.0206)	(0.0174)	(0.0209)	(0.0254)
Married	0.00265	-0.00480	0.0236	0.0200	0.00207	0.0416
	(0.0211)	(0.0350)	(0.0292)	(0.0310)	(0.0294)	(0.0362)
Ethnicity	0.103*	0.0797	0.151	0.0982	0.0929	-0.0172
	(0.0609)	(0.0972)	(0.0957)	(0.0751)	(0.1044)	(0.1415)
Age	0.0617***	0.0578***	0.0619***	0.0526***	0.0555***	0.0613***
	(0.0066)	(0.0098)	(0.0099)	(0.0086)	(0.0085)	(0.0114)
age^2	-0.000854***	-0.000837***	-0.000876***	-0.000736***	-0.000780***	-0.000810***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0334***	0.0188***	0.0219***	0.0336***	0.0465***	0.0481***
	(0.0042)	(0.0063)	(0.0059)	(0.0052)	(0.0060)	(0.0079)
Tenure squared	-0.000721***	-0.000231	-0.000183	-0.000716***	-0.00119***	-0.00120***
	(0.0002)	(0.0003)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Agriculture, forestry and animal husbandry	-0.0237	0.414***	0.235**	0.0338	-0.199*	-0.477***
	(0.2862)	(0.1598)	(0.1024)	(0.0688)	(0.1175)	(0.1816)
Manufacture, production and construction	0.0556***	0.0604**	0.0399	0.0688***	0.0527**	0.0410
	(0.0188)	(0.0295)	(0.0275)	(0.0224)	(0.0262)	(0.0284)
Information Transmission and Transportation	0.0427	0.0784	0.0787	0.0163	0.0269	0.0321
	(0.0398)	(0.0499)	(0.0520)	(0.0498)	(0.0541)	(0.0758)
Finance and Business	0.00514	0.00637	0.00737	0.0187	-0.0271	-0.0302
	(0.0286)	(0.0551)	(0.0369)	(0.0338)	(0.0399)	(0.0448)
Public	-0.0410	-0.0931	-0.0245	-0.0184	-0.0557	-0.0833*
	(0.0289)	(0.0574)	(0.0397)	(0.0333)	(0.0372)	(0.0505)
State	0.0145	0.00498	0.00267	0.0194	0.0169	0.0146
	(0.0206)	(0.0386)	(0.0302)	(0.0266)	(0.0278)	(0.0323)
Firm size 1 (1 to 5 employees)	-0.148***	-0.171***	-0.194***	-0.138***	-0.123***	-0.123**
	(0.0281)	(0.0455)	(0.0363)	(0.0381)	(0.0386)	(0.0499)
Firm size 2 (6 to 20 employees)	-0.0604***	-0.0338	-0.0538*	-0.0741**	-0.0707**	-0.0621*
	(0.0218)	(0.0342)	(0.0281)	(0.0297)	(0.0330)	(0.0331)
Firm size 3 (21 to 99 employees)	0.00956	0.0310	0.0158	0.00858	0.000612	0.00423
	(0.0183)	(0.0286)	(0.0271)	(0.0226)	(0.0242)	(0.0276)
Permanent	0.0561**	0.0826**	0.0582*	0.0593*	0.0521*	0.0552
	(0.0238)	(0.0349)	(0.0313)	(0.0311)	(0.0306)	(0.0451)
Long term	0.105***	0.131***	0.135***	0.119***	0.0603**	0.0768**
	(0.0186)	(0.0301)	(0.0236)	(0.0235)	(0.0287)	(0.0304)
Short term	0.0545**	0.0969***	0.0585**	0.0526*	-0.0180	0.0479
	(0.0246)	(0.0350)	(0.0292)	(0.0289)	(0.0366)	(0.0413)
Henan	-0.346***	-0.399***	-0.372***	-0.338***	-0.294***	-0.347***
	(0.0317)	(0.0695)	(0.0403)	(0.0440)	(0.0471)	(0.0436)
Anhui	-0.341***	-0.419***	-0.332***	-0.348***	-0.335***	-0.368***
	(0.0299)	(0.0491)	(0.0414)	(0.0383)	(0.0388)	(0.0451)
Chongqing	-0.391***	-0.364***	-0.365***	-0.420***	-0.427***	-0.422***
	(0.0292)	(0.0421)	(0.0331)	(0.0331)	(0.0426)	(0.0509)
Shanghai	-0.0248	-0.0514	-0.0408	0.00702	0.0175	-0.0594
	(0.0297)	(0.0512)	(0.0376)	(0.0382)	(0.0321)	(0.0502)
Jiangsu	-0.0921***	-0.108***	-0.0362	-0.105***	-0.117***	-0.133***
	(0.0246)	(0.0358)	(0.0323)	(0.0296)	(0.0325)	(0.0390)
Zhejiang	-0.0989***	-0.0862**	-0.0683**	-0.108***	-0.0966***	-0.127***
	(0.0238)	(0.0359)	(0.0289)	(0.0339)	(0.0320)	(0.0368)
Hubei	-0.342***	-0.358***	-0.350***	-0.365***	-0.348***	-0.310***
	(0.0292)	(0.0339)	(0.0324)	(0.0371)	(0.0449)	(0.0526)
Sichuan	-0.162***	-0.269***	-0.169***	-0.142***	-0.163***	-0.147***
	(0.0303)	(0.0447)	(0.0500)	(0.0379)	(0.0481)	(0.0428)
Constant	0.482***	0.218	0.227	0.598***	0.769***	1.018***
	(0.1251)	(0.1945)	(0.1937)	(0.1628)	(0.1806)	(0.2174)
Observations	3301	3301	3301	3301	3301	3301
R^2	0.320					

Note: (0.90-0.10): schooling= 0. 0154*; (0.75-0.25); schooling =0.0109****

Table 4-13 OLS VS QR Model 3 for migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0346***	0.0297***	0.0385***	0.0431***	0.0394***	0.0344***
	(0.0041)	(0.0076)	(0.0065)	(0.0058)	(0.0053)	(0.0060)
Old	-0.0226	0.0842	0.0789	0.0611	-0.0462	-0.190*
	(0.0624)	(0.1044)	(0.0818)	(0.0823)	(0.0859)	(0.1031)
Old*Schooling	-0.00983*	-0.0160*	-0.0214**	-0.0184**	-0.00610	-0.000178
	(0.0054)	(0.0090)	(0.0084)	(0.0073)	(0.0074)	(0.0084)
Training	0.0960***	0.0986***	0.0941***	0.0922***	0.118***	0.0619***
	(0.0166)	(0.0279)	(0.0208)	(0.0204)	(0.0221)	(0.0236)
male	0.128***	0.0922***	0.0918***	0.124***	0.146***	0.149***
	(0.0153)	(0.0236)	(0.0199)	(0.0175)	(0.0213)	(0.0264)
Married	0.00764	-0.0215	0.0404	0.0396	0.00357	0.0412
	(0.0213)	(0.0351)	(0.0274)	(0.0295)	(0.0310)	(0.0353)
Ethnicity	0.103*	0.110	0.118	0.0865	0.0938	-0.0187
	(0.0609)	(0.0925)	(0.1004)	(0.0723)	(0.1057)	(0.1447)
Age	0.0608***	0.0610***	0.0579***	0.0496***	0.0560***	0.0614***
	(0.0066)	(0.0098)	(0.0092)	(0.0081)	(0.0088)	(0.0114)
age^2	-0.000849***	-0.000878***	-0.000827***	-0.000709***	-0.000792***	-0.000810***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0339***	0.0229***	0.0266***	0.0351***	0.0480***	0.0482***
	(0.0042)	(0.0065)	(0.0058)	(0.0050)	(0.0060)	(0.0079)
Tenure squared	-0.000734***	-0.000375	-0.000448	-0.000751***	-0.00120***	-0.00120***
	(0.0002)	(0.0004)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Agriculture, forestry and animal husbandry	-0.0442	0.414***	0.156	0.0223	-0.195	-0.475***
	(0.2863)	(0.1481)	(0.0954)	(0.0854)	(0.1263)	(0.1766)
Manufacture, production and construction	0.0562***	0.0763**	0.0422	0.0669***	0.0509**	0.0411
	(0.0188)	(0.0306)	(0.0263)	(0.0215)	(0.0258)	(0.0290)
Information Transmission and Transportation	0.0420	0.0718	0.0637	0.0136	0.0203	0.0317
	(0.0398)	(0.0523)	(0.0524)	(0.0477)	(0.0548)	(0.0758)
Finance and Business	0.00579	-0.00878	0.0283	0.0241	-0.0221	-0.0310
	(0.0286)	(0.0534)	(0.0363)	(0.0330)	(0.0417)	(0.0459)
Public	-0.0409	-0.0816	-0.0229	-0.0244	-0.0554	-0.0822
	(0.0289)	(0.0568)	(0.0392)	(0.0347)	(0.0367)	(0.0509)
State	0.0149	-0.00450	0.00312	0.0203	0.0230	0.0147
	(0.0206)	(0.0366)	(0.0306)	(0.0257)	(0.0274)	(0.0330)
Firm size 1 (1 to 5 employees)	-0.146***	-0.190***	-0.203***	-0.146***	-0.126***	-0.123**
	(0.0281)	(0.0458)	(0.0375)	(0.0365)	(0.0390)	(0.0492)
Firm size 2 (6 to 20 employees)	-0.0588***	-0.0352	-0.0554**	-0.0674**	-0.0707**	-0.0615*
	(0.0218)	(0.0359)	(0.0271)	(0.0298)	(0.0331)	(0.0333)
Firm size 3 (21 to 99 employees)	0.0103	0.0284	0.00764	0.0105	-0.00114	0.00319
	(0.0183)	(0.0290)	(0.0267)	(0.0222)	(0.0250)	(0.0272)
Permanent	0.0557**	0.0666*	0.0444	0.0561*	0.0503	0.0553
	(0.0237)	(0.0373)	(0.0305)	(0.0293)	(0.0313)	(0.0449)
Long term	0.104***	0.125***	0.131***	0.116***	0.0661**	0.0778***
	(0.0186)	(0.0297)	(0.0233)	(0.0229)	(0.0294)	(0.0302)
Short term	0.0543**	0.0953***	0.0547*	0.0411	-0.0126	0.0493
	(0.0246)	(0.0359)	(0.0292)	(0.0290)	(0.0371)	(0.0405)
Henan	-0.346***	-0.376***	-0.373***	-0.349***	-0.291***	-0.344***
	(0.0317)	(0.0681)	(0.0403)	(0.0424)	(0.0473)	(0.0430)
Anhui	-0.343***	-0.388***	-0.331***	-0.350***	-0.335***	-0.367***
	(0.0299)	(0.0488)	(0.0404)	(0.0371)	(0.0389)	(0.0435)
Chongqing	-0.391***	-0.373***	-0.363***	-0.426***	-0.425***	-0.419***
	(0.0292)	(0.0420)	(0.0326)	(0.0339)	(0.0428)	(0.0519)
Shanghai	-0.0262	-0.0409	-0.0451	0.00135	0.0154	-0.0568
	(0.0297)	(0.0488)	(0.0367)	(0.0375)	(0.0318)	(0.0505)
Jiangsu	-0.0948***	-0.101***	-0.0610*	-0.112***	-0.123***	-0.132***
	(0.0246)	(0.0364)	(0.0323)	(0.0296)	(0.0321)	(0.0391)
Zhejiang	-0.0993***	-0.0795**	-0.0782***	-0.109***	-0.0950***	-0.126***
	(0.0238)	(0.0353)	(0.0299)	(0.0327)	(0.0324)	(0.0374)
Hubei	-0.341***	-0.350***	-0.355***	-0.360***	-0.351***	-0.307***
	(0.0292)	(0.0356)	(0.0340)	(0.0344)	(0.0422)	(0.0524)
Sichuan	-0.164***	-0.246***	-0.176***	-0.151***	-0.163***	-0.146***
	(0.0303)	(0.0439)	(0.0496)	(0.0383)	(0.0495)	(0.0431)
Constant	0.442***	0.0350	0.195	0.544***	0.728***	1.016***
	(0.1270)	(0.2014)	(0.1957)	(0.1571)	(0.1843)	(0.2219)
Observations	3301	3301	3301	3301	3301	3301
R^2	0.321					

Table 4-14 OLS VS QR Model 4 for migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0371***	0.0288***	0.0295***	0.0387***	0.0478***	0.0380***
	(0.0047)	(0.0061)	(0.0068)	(0.0057)	(0.0061)	(0.0073)
OVER	0.000685	-0.0160	0.0287	0.0291	-0.0183	0.0333
	(0.0262)	(0.0466)	(0.0338)	(0.0321)	(0.0364)	(0.0380)
UNDER	0.0927***	0.0838*	0.0680*	0.107***	0.124***	0.0538
	(0.0332)	(0.0439)	(0.0411)	(0.0403)	(0.0462)	(0.0527)
Training	0.0957***	0.107***	0.105***	0.0823***	0.101***	0.0727***
	(0.0167)	(0.0258)	(0.0209)	(0.0202)	(0.0207)	(0.0253)
male	0.130***	0.0864***	0.102***	0.122***	0.155***	0.164***
	(0.0153)	(0.0225)	(0.0210)	(0.0168)	(0.0205)	(0.0255)
Married	0.00215	-0.00573	0.0348	0.0142	0.00704	0.0158
	(0.0212)	(0.0355)	(0.0282)	(0.0275)	(0.0280)	(0.0360)
Ethnicity	0.107*	0.0600	0.149	0.0825	0.128	0.0462
	(0.0610)	(0.1058)	(0.1025)	(0.0759)	(0.0935)	(0.1525)
Age	0.0472***	0.0495***	0.0444***	0.0389***	0.0413***	0.0399***
	(0.0056)	(0.0089)	(0.0081)	(0.0065)	(0.0073)	(0.0091)
age^2	-0.000718***	-0.000751***	-0.000693***	-0.000616***	-0.000645***	-0.000598***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0331***	0.0215***	0.0230***	0.0336***	0.0465***	0.0484***
	(0.0042)	(0.0063)	(0.0059)	(0.0050)	(0.0055)	(0.0080)
Tenure squared	-0.000707***	-0.000292	-0.000332	-0.000663***	-0.00119***	-0.00130***
	(0.0002)	(0.0004)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Agriculture, forestry and animal husbandry	-0.0578	0.397**	0.208**	-0.0109	-0.263**	-0.503***
	(0.2869)	(0.1542)	(0.0910)	(0.0652)	(0.1285)	(0.1846)
Manufacture, production and construction	0.0551***	0.0567*	0.0299	0.0782***	0.0474*	0.0341
	(0.0189)	(0.0290)	(0.0269)	(0.0215)	(0.0244)	(0.0302)
Information Transmission and Transportation	0.0443	0.0601	0.105**	0.0341	0.0123	0.0130
	(0.0399)	(0.0540)	(0.0528)	(0.0477)	(0.0597)	(0.0796)
Finance and Business	-0.00111	-0.0145	0.0407	0.0268	-0.0439	-0.0413
	(0.0288)	(0.0551)	(0.0378)	(0.0304)	(0.0381)	(0.0442)
Public	-0.0386	-0.0874	-0.0336	-0.00977	-0.0661*	-0.0694
	(0.0290)	(0.0598)	(0.0419)	(0.0373)	(0.0373)	(0.0516)
State	0.0119	0.00516	-0.0123	0.0208	0.0173	0.0230
	(0.0206)	(0.0376)	(0.0296)	(0.0264)	(0.0264)	(0.0343)
Firm size 1 (1 to 5 employees)	-0.149***	-0.198***	-0.209***	-0.132***	-0.135***	-0.142***
	(0.0282)	(0.0453)	(0.0399)	(0.0357)	(0.0364)	(0.0543)
Firm size 2 (6 to 20 employees)	-0.0604***	-0.0440	-0.0547**	-0.0563**	-0.0772**	-0.0712**
	(0.0218)	(0.0338)	(0.0271)	(0.0284)	(0.0334)	(0.0360)
Firm size 3 (21 to 99 employees)	0.0117	0.0254	0.0145	0.0198	0.0102	-0.00488
	(0.0183)	(0.0288)	(0.0284)	(0.0209)	(0.0240)	(0.0282)
Permanent	0.0585**	0.0665*	0.0489	0.0740***	0.0501	0.0533
	(0.0238)	(0.0355)	(0.0344)	(0.0285)	(0.0309)	(0.0425)
Long term	0.106***	0.135***	0.141***	0.118***	0.0714***	0.0781**
	(0.0186)	(0.0300)	(0.0239)	(0.0219)	(0.0275)	(0.0306)
Short term	0.0562**	0.103***	0.0605*	0.0538**	-0.00749	0.0382
	(0.0246)	(0.0362)	(0.0309)	(0.0264)	(0.0327)	(0.0433)
Henan	-0.342***	-0.375***	-0.363***	-0.334***	-0.272***	-0.325***
	(0.0317)	(0.0681)	(0.0419)	(0.0412)	(0.0443)	(0.0441)
Anhui	-0.337***	-0.406***	-0.320***	-0.349***	-0.320***	-0.368***
	(0.0299)	(0.0486)	(0.0442)	(0.0358)	(0.0373)	(0.0482)
Chongqing	-0.390***	-0.379***	-0.364***	-0.405***	-0.418***	-0.386***
	(0.0293)	(0.0413)	(0.0352)	(0.0312)	(0.0443)	(0.0546)
Shanghai	-0.0231	-0.0426	-0.0316	0.00747	0.0363	-0.0575
	(0.0297)	(0.0506)	(0.0368)	(0.0385)	(0.0313)	(0.0559)
Jiangsu	-0.0922***	-0.104***	-0.0495	-0.0875***	-0.112***	-0.140***
	(0.0247)	(0.0359)	(0.0313)	(0.0270)	(0.0321)	(0.0412)
Zhejiang	-0.0955***	-0.0899***	-0.0777***	-0.0940***	-0.0965***	-0.139***
	(0.0239)	(0.0347)	(0.0300)	(0.0316)	(0.0291)	(0.0336)
Hubei	-0.344***	-0.353***	-0.363***	-0.339***	-0.338***	-0.302***
	(0.0292)	(0.0320)	(0.0382)	(0.0329)	(0.0418)	(0.0590)
Sichuan	-0.170***	-0.264***	-0.192***	-0.142***	-0.162***	-0.166***
	(0.0306)	(0.0451)	(0.0494)	(0.0379)	(0.0437)	(0.0437)
Constant	0.636***	0.288	0.463**	0.753***	0.853***	1.268***
	(0.1172)	(0.1849)	(0.1864)	(0.1466)	(0.1553)	(0.2173)
Observations	3301	3301	3301	3301	3301	3301
R^2	0.319					

Table 4-15 OLS VS QR Model 5 for migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0359***	0.0286***	0.0281***	0.0378***	0.0439***	0.0376***
	(0.0047)	(0.0062)	(0.0066)	(0.0058)	(0.0060)	(0.0074)
OVER	-0.00195	-0.0290	0.0259	0.0356	0.00611	0.00983
	(0.0261)	(0.0463)	(0.0332)	(0.0335)	(0.0356)	(0.0412)
UNDER	0.0891***	0.0829*	0.0658*	0.108***	0.103**	0.0494
	(0.0331)	(0.0448)	(0.0397)	(0.0406)	(0.0449)	(0.0533)
Old	-0.117***	-0.0457	-0.120***	-0.0963**	-0.0926**	-0.175***
	(0.0307)	(0.0493)	(0.0423)	(0.0417)	(0.0394)	(0.0521)
Training	0.0946***	0.106***	0.0996***	0.0845***	0.111***	0.0628***
	(0.0166)	(0.0272)	(0.0215)	(0.0201)	(0.0215)	(0.0243)
male	0.129***	0.0789***	0.0973***	0.123***	0.149***	0.156***
	(0.0153)	(0.0230)	(0.0205)	(0.0171)	(0.0212)	(0.0263)
Married	0.00585	-0.0205	0.0372	0.0283	-0.00341	0.0217
	(0.0212)	(0.0367)	(0.0275)	(0.0301)	(0.0289)	(0.0356)
Ethnicity	0.106*	0.0718	0.131	0.0759	0.131	-0.0183
	(0.0609)	(0.1051)	(0.1005)	(0.0773)	(0.0933)	(0.1389)
Age	0.0608***	0.0563***	0.0576***	0.0492***	0.0539***	0.0617***
	(0.0066)	(0.0100)	(0.0093)	(0.0081)	(0.0086)	(0.0113)
age^2	-0.000849***	-0.000817***	-0.000819***	-0.000715***	-0.000766***	-0.000816***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0336***	0.0209***	0.0248***	0.0352***	0.0480***	0.0496***
	(0.0042)	(0.0066)	(0.0058)	(0.0051)	(0.0056)	(0.0081)
Tenure squared	-0.000711***	-0.000301	-0.000379	-0.000706***	-0.00123***	-0.00134***
	(0.0002)	(0.0004)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Agriculture, forestry and animal husbandry	-0.0647	0.403***	0.192**	-0.0237	-0.251*	-0.513***
	(0.2863)	(0.1537)	(0.0917)	(0.0722)	(0.1333)	(0.1889)
Manufacture, production and construction	0.0543***	0.0627**	0.0370	0.0676***	0.0474*	0.0439
	(0.0188)	(0.0300)	(0.0276)	(0.0218)	(0.0260)	(0.0284)
Information Transmission and Transportation	0.0441	0.0583	0.0727	0.0127	0.0321	0.0419
	(0.0398)	(0.0539)	(0.0490)	(0.0454)	(0.0603)	(0.0764)
Finance and Business	0.00138	-0.0147	0.0212	0.0107	-0.0268	-0.0406
	(0.0287)	(0.0530)	(0.0376)	(0.0314)	(0.0400)	(0.0463)
Public	-0.0407	-0.0811	-0.0287	-0.0210	-0.0564	-0.0745
	(0.0289)	(0.0594)	(0.0404)	(0.0361)	(0.0374)	(0.0527)
State	0.0150	0.00739	0.00385	0.0303	0.0151	0.0119
	(0.0206)	(0.0383)	(0.0298)	(0.0265)	(0.0256)	(0.0332)
Firm size 1 (1 to 5 employees)	-0.148***	-0.192***	-0.200***	-0.135***	-0.129***	-0.134***
	(0.0281)	(0.0447)	(0.0373)	(0.0361)	(0.0377)	(0.0494)
Firm size 2 (6 to 20 employees)	-0.0614***	-0.0395	-0.0565**	-0.0585**	-0.0753**	-0.0759**
	(0.0218)	(0.0342)	(0.0287)	(0.0292)	(0.0330)	(0.0345)
Firm size 3 (21 to 99 employees)	0.0107	0.0226	0.0148	0.0181	0.00808	-0.00273
	(0.0183)	(0.0285)	(0.0277)	(0.0213)	(0.0243)	(0.0283)
Permanent	0.0562**	0.0755**	0.0503	0.0703**	0.0434	0.0591
	(0.0237)	(0.0354)	(0.0334)	(0.0294)	(0.0329)	(0.0449)
Long term	0.105***	0.135***	0.137***	0.115***	0.0673**	0.0704**
	(0.0186)	(0.0303)	(0.0231)	(0.0224)	(0.0285)	(0.0294)
Short term	0.0562**	0.102***	0.0603**	0.0489*	-0.0136	0.0234
	(0.0246)	(0.0370)	(0.0292)	(0.0277)	(0.0353)	(0.0418)
Henan	-0.342***	-0.381***	-0.364***	-0.347***	-0.282***	-0.354***
	(0.0317)	(0.0683)	(0.0403)	(0.0412)	(0.0455)	(0.0447)
Anhui	-0.340***	-0.418***	-0.329***	-0.351***	-0.345***	-0.372***
	(0.0299)	(0.0520)	(0.0432)	(0.0359)	(0.0395)	(0.0451)
Chongqing	-0.388***	-0.379***	-0.365***	-0.410***	-0.436***	-0.424***
	(0.0292)	(0.0419)	(0.0350)	(0.0331)	(0.0430)	(0.0543)
Shanghai	-0.0239	-0.0288	-0.0500	0.00600	0.0208	-0.0503
	(0.0297)	(0.0511)	(0.0398)	(0.0384)	(0.0316)	(0.0500)
Jiangsu	-0.0927***	-0.103***	-0.0520	-0.103***	-0.119***	-0.140***
	(0.0246)	(0.0365)	(0.0329)	(0.0281)	(0.0313)	(0.0393)
Zhejiang	-0.0962***	-0.0906**	-0.0735**	-0.101***	-0.110***	-0.138***
	(0.0239)	(0.0358)	(0.0293)	(0.0327)	(0.0300)	(0.0381)
Hubei	-0.342***	-0.348***	-0.364***	-0.344***	-0.343***	-0.319***
	(0.0292)	(0.0329)	(0.0354)	(0.0353)	(0.0436)	(0.0540)
Sichuan	-0.167***	-0.257***	-0.177***	-0.151***	-0.168***	-0.144***
	(0.0305)	(0.0458)	(0.0488)	(0.0383)	(0.0447)	(0.0454)
Constant	0.421***	0.169	0.270	0.603***	0.682***	0.984***
	(0.1297)	(0.2003)	(0.2033)	(0.1623)	(0.1737)	(0.2198)
Observations	3301	3301	3301	3301	3301	3301
R^2	0.322					

Table 4-16 OLS VS QR Model 6 for migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0363***	0.0286***	0.0267***	0.0389***	0.0448***	0.0389***
	(0.0047)	(0.0066)	(0.0066)	(0.0058)	(0.0060)	(0.0076)
OVER	-0.0205	-0.0251	0.0237	0.00942	-0.0318	-0.0333
	(0.0285)	(0.0529)	(0.0368)	(0.0354)	(0.0386)	(0.0416)
UNDER	0.00834	0.0272	-0.0682	-0.00239	0.0461	0.0208
	(0.0517)	(0.0897)	(0.0606)	(0.0752)	(0.0567)	(0.1272)
Old	-0.138***	-0.0713	-0.135***	-0.123***	-0.131***	-0.203***
	(0.0322)	(0.0542)	(0.0435)	(0.0419)	(0.0433)	(0.0520)
OVER*Old	0.0587	0.0117	0.0132	0.0726	0.100	0.121*
	(0.0440)	(0.0768)	(0.0661)	(0.0630)	(0.0629)	(0.0696)
UNDER*Old	0.112**	0.105	0.160***	0.127	0.103*	0.0573
	(0.0545)	(0.0911)	(0.0615)	(0.0808)	(0.0603)	(0.1326)
Training	0.0949***	0.0972***	0.100***	0.0870***	0.118***	0.0750***
	(0.0166)	(0.0278)	(0.0216)	(0.0201)	(0.0215)	(0.0247)
male	0.129***	0.0864***	0.100***	0.124***	0.142***	0.149***
	(0.0153)	(0.0236)	(0.0201)	(0.0175)	(0.0209)	(0.0256)
Married	0.00627	-0.0166	0.0307	0.0282	-0.00473	0.0297
	(0.0212)	(0.0353)	(0.0261)	(0.0302)	(0.0307)	(0.0352)
Ethnicity	0.100	0.0900	0.136	0.0710	0.151*	-0.0336
	(0.0609)	(0.0991)	(0.0975)	(0.0738)	(0.0894)	(0.1438)
Age	0.0620***	0.0561***	0.0602***	0.0515***	0.0565***	0.0610***
	(0.0066)	(0.0098)	(0.0094)	(0.0080)	(0.0088)	(0.0110)
age^2	-0.000867***	-0.000814***	-0.000855***	-0.000738***	-0.000798***	-0.000801***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0338***	0.0258***	0.0258***	0.0351***	0.0486***	0.0485***
	(0.0042)	(0.0065)	(0.0059)	(0.0051)	(0.0058)	(0.0076)
Tenure squared	-0.000706***	-0.000618*	-0.000423	-0.000692***	-0.00123***	-0.00132***
	(0.0002)	(0.0004)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Agriculture, forestry and animal husbandry	-0.0679	0.365**	0.202**	-0.0273	-0.264**	-0.510***
	(0.2862)	(0.1523)	(0.0864)	(0.0679)	(0.1265)	(0.1884)
Manufacture, production and construction	0.0552***	0.0620**	0.0330	0.0618***	0.0576**	0.0359
	(0.0188)	(0.0300)	(0.0266)	(0.0218)	(0.0264)	(0.0284)
Information Transmission and Transportation	0.0455	0.0468	0.0668	0.0158	0.0462	0.0539
	(0.0398)	(0.0557)	(0.0506)	(0.0434)	(0.0590)	(0.0819)
Finance and Business	0.00136	-0.0177	0.0182	0.0122	-0.0165	-0.0384
	(0.0287)	(0.0538)	(0.0376)	(0.0322)	(0.0384)	(0.0467)
Public	-0.0380	-0.0962	-0.0250	-0.0317	-0.0537	-0.0792
	(0.0289)	(0.0588)	(0.0396)	(0.0368)	(0.0377)	(0.0522)
State	0.0149	0.0106	0.000905	0.0266	0.0218	0.00638
	(0.0206)	(0.0382)	(0.0297)	(0.0257)	(0.0263)	(0.0339)
Firm size 1 (1 to 5 employees)	-0.149***	-0.184***	-0.202***	-0.138***	-0.126***	-0.144***
	(0.0281)	(0.0445)	(0.0380)	(0.0357)	(0.0386)	(0.0500)
Firm size 2 (6 to 20 employees)	-0.0626***	-0.0430	-0.0571**	-0.0616**	-0.0720**	-0.0698**
	(0.0218)	(0.0347)	(0.0264)	(0.0281)	(0.0332)	(0.0355)
Firm size 3 (21 to 99 employees)	0.00953	0.0272	0.00761	0.0115	0.0115	0.00399
	(0.0183)	(0.0297)	(0.0265)	(0.0219)	(0.0248)	(0.0291)
Permanent	0.0560**	0.0636*	0.0532*	0.0725**	0.0589*	0.0515
	(0.0237)	(0.0363)	(0.0323)	(0.0297)	(0.0331)	(0.0461)
Long term	0.105***	0.128***	0.141***	0.124***	0.0762***	0.0663**
	(0.0186)	(0.0303)	(0.0240)	(0.0220)	(0.0292)	(0.0293)
Short term	0.0571**	0.0883**	0.0695**	0.0544*	0.00415	0.0289
	(0.0246)	(0.0378)	(0.0300)	(0.0280)	(0.0366)	(0.0391)
Henan	-0.342***	-0.398***	-0.370***	-0.346***	-0.268***	-0.332***
	(0.0317)	(0.0681)	(0.0402)	(0.0412)	(0.0483)	(0.0466)
Anhui	-0.339***	-0.408***	-0.325***	-0.352***	-0.337***	-0.359***
	(0.0299)	(0.0524)	(0.0408)	(0.0356)	(0.0398)	(0.0444)
Chongqing	-0.387***	-0.374***	-0.365***	-0.409***	-0.434***	-0.405***
	(0.0292)	(0.0436)	(0.0352)	(0.0331)	(0.0436)	(0.0508)
Shanghai	-0.0233	-0.0572	-0.0437	0.00454	0.0202	-0.0479
	(0.0297)	(0.0505)	(0.0385)	(0.0373)	(0.0321)	(0.0497)
Jiangsu	-0.0916***	-0.109***	-0.0532	-0.0985***	-0.131***	-0.111***
	(0.0246)	(0.0367)	(0.0348)	(0.0284)	(0.0325)	(0.0375)
Zhejiang	-0.0958***	-0.101***	-0.0794***	-0.102***	-0.103***	-0.118***
	(0.0239)	(0.0367)	(0.0295)	(0.0326)	(0.0299)	(0.0375)
Hubei	-0.340***	-0.355***	-0.359***	-0.340***	-0.337***	-0.289***
	(0.0292)	(0.0340)	(0.0346)	(0.0353)	(0.0457)	(0.0519)
Sichuan	-0.166***	-0.272***	-0.175***	-0.158***	-0.161***	-0.117***
	(0.0305)	(0.0463)	(0.0481)	(0.0378)	(0.0453)	(0.0452)
Constant	0.412***	0.163	0.245	0.564***	0.600***	0.992***
	(0.1297)	(0.1946)	(0.1999)	(0.1617)	(0.1714)	(0.2225)
Observations	3301	3301	3301	3301	3301	3301
R^2	0.323					

Table 4-17 Wage returns to education in urban sample (OLS)

Variables	Model 1	Model 2
Years of schooling	0.0565***	0.0667***
	(0.0027)	(0.0035)
OVER		-0.1237***
		(0.0286)
UNDER		0.0764***
		(0.0273)
male	0.1758***	0.1769***
	(0.0158)	(0.0158)
Married	0.0625**	0.0606**
	(0.0252)	(0.0251)
Ethnicity	0.0439	0.0444
	(0.0766)	(0.0764)
age	0.0113	0.0112
	(0.0080)	(0.0080)
age^2	-0.0002*	-0.0002*
	(0.0001)	(0.0001)
Tenure of current job	0.0262***	0.0260***
	(0.0030)	(0.0030)
Tenure squared	-0.0005***	-0.0005***
	(0.0001)	(0.0001)
Agriculture, Forestry, Animal husbandry	0.3798***	0.3747***
	(0.0883)	(0.0881)
Manufacture, production and construction	0.1072***	0.0996***
	(0.0227)	(0.0228)
Information Transmission and Transportation	0.1857***	0.1760***
	(0.0267)	(0.0267)
Business and Finance	0.2758***	0.2685***
	(0.0290)	(0.0290)
Public	0.2576***	0.2432***
	(0.0237)	(0.0239)
State	-0.0306	-0.0316*
	(0.0186)	(0.0186)
Firm size 1 (1 to 5 employees)	-0.1617***	-0.1641***
	(0.0392)	(0.0392)
Firm size 2 (6 to 20 employees)	-0.1477***	-0.1465***
	(0.0233)	(0.0233)
Firm size 3 (21 to 99 employees)	-0.0358*	-0.0387**
	(0.0184)	(0.0184)
Permanent	0.4261***	0.4215***
	(0.0321)	(0.0320)
Long term	0.2507***	0.2471***
	(0.0273)	(0.0273)
Short term	-0.0413	-0.0403
	(0.0430)	(0.0430)
Henan	-0.7765***	-0.7733***
	(0.0298)	(0.0298)
Anhui	-0.7624***	-0.7595***
	(0.0298)	(0.0298)
Chongqing	-0.6333***	-0.6229***
	(0.0329)	(0.0329)
Shanghai	-0.1555***	-0.1592***
	(0.0296)	(0.0297)
Jiangsu	-0.4504***	-0.4471***
	(0.0298)	(0.0298)
Zhejiang	-0.2515***	-0.2551***
	(0.0300)	(0.0299)
Hubei	-0.5347***	-0.5335***
	(0.0324)	(0.0323)
Sichuan	-0.5939***	-0.5941***
	(0.0293)	(0.0293)
Constant	1.3212***	1.2140***
	(0.1751)	(0.1768)
Observations	5921	5921
R^2	0.4026	0.4049

*** p<0.10, ** p<0.05, *** p<0.010**

Note: (1) Service is the benchmark industry. (2) Firm size above 100 employees is the benchmark group (3) Others (non-contract temporary job, temporary job and others) is the benchmark job type; (4) Guangdong is the base province; (5) Non-public is the benchmark work unit type.

Table 4-18 OLS VS QR wage returns to education in urban sample

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0565***	0.0512***	0.0583***	0.0615***	0.0625***	0.0652***
	(0.0027)	(0.0043)	(0.0033)	(0.0039)	(0.0044)	(0.0060)
male	0.176***	0.132***	0.163***	0.189***	0.182***	0.216***
	(0.0158)	(0.0200)	(0.0195)	(0.0190)	(0.0189)	(0.0311)
Married	0.0625**	0.0423	0.0405	0.0441	0.0873***	0.0771
	(0.0252)	(0.0287)	(0.0281)	(0.0349)	(0.0278)	(0.0498)
Ethnicity	0.0439	0.0751	0.187**	0.100	-0.0803	-0.0275
	(0.0766)	(0.0600)	(0.0787)	(0.1176)	(0.1229)	(0.2813)
age	0.0113	0.0140	0.0134	0.0200*	0.00296	0.0102
	(0.0080)	(0.0095)	(0.0085)	(0.0102)	(0.0120)	(0.0152)
age^2	-0.000163*	-0.000219*	-0.000215**	-0.000271**	-0.0000466	-0.000104
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Tenure of current job	0.0262***	0.0219***	0.0259***	0.0275***	0.0296***	0.0274***
	(0.0030)	(0.0038)	(0.0035)	(0.0036)	(0.0039)	(0.0057)
Tenure squared	-0.000489***	-0.000429***	-0.000480***	-0.000455***	-0.000516***	-0.000543***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Agriculture, Forestry, Animal husbandary	0.380***	0.362***	0.315***	0.380***	0.377**	0.475*
	(0.0883)	(0.1339)	(0.1103)	(0.1051)	(0.1671)	(0.2523)
Manufacture, production and construction	0.107***	0.0281	0.0888***	0.0918***	0.142***	0.146***
	(0.0227)	(0.0269)	(0.0270)	(0.0254)	(0.0308)	(0.0463)
Information Transmission and Transportation	0.186***	0.175***	0.168***	0.169***	0.192***	0.220***
	(0.0267)	(0.0350)	(0.0281)	(0.0317)	(0.0330)	(0.0521)
Business and Finance	0.276***	0.196***	0.203***	0.234***	0.280***	0.334***
	(0.0290)	(0.0329)	(0.0315)	(0.0372)	(0.0397)	(0.0859)
Public	0.258***	0.200***	0.219***	0.246***	0.279***	0.265***
	(0.0237)	(0.0330)	(0.0261)	(0.0265)	(0.0291)	(0.0472)
State	-0.0306	-0.0282	0.00983	-0.0397*	-0.0455**	-0.0506
	(0.0186)	(0.0222)	(0.0202)	(0.0223)	(0.0221)	(0.0410)
Firm size 1 (1 to 5 employees)	-0.162***	-0.142***	-0.161***	-0.204***	-0.148**	-0.116
	(0.0392)	(0.0537)	(0.0388)	(0.0494)	(0.0603)	(0.0833)
Firm size 2 (6 to 20 employees)	-0.148***	-0.163***	-0.102***	-0.158***	-0.150***	-0.144***
	(0.0233)	(0.0287)	(0.0268)	(0.0268)	(0.0286)	(0.0438)
Firm size 3 (21 to 99 employees)	-0.0358*	-0.0855***	-0.0388*	-0.0496**	-0.0149	0.0457
	(0.0184)	(0.0222)	(0.0234)	(0.0220)	(0.0229)	(0.0375)
Permanent	0.426***	0.487***	0.452***	0.410***	0.386***	0.299***
	(0.0321)	(0.0421)	(0.0375)	(0.0435)	(0.0511)	(0.0641)
Long term	0.251***	0.314***	0.247***	0.252***	0.237***	0.159***
	(0.0273)	(0.0306)	(0.0298)	(0.0338)	(0.0450)	(0.0573)
Short term	-0.0413	0.0589	0.00190	-0.00370	-0.0856	-0.124
	(0.0430)	(0.0444)	(0.0385)	(0.0462)	(0.0643)	(0.0963)
Henan	-0.777***	-0.757***	-0.698***	-0.695***	-0.856***	-0.910***
	(0.0298)	(0.0432)	(0.0353)	(0.0360)	(0.0402)	(0.0710)
Anhui	-0.762***	-0.665***	-0.662***	-0.697***	-0.798***	-0.922***
	(0.0298)	(0.0385)	(0.0304)	(0.0377)	(0.0419)	(0.0648)
Chongqing	-0.633***	-0.458***	-0.484***	-0.569***	-0.731***	-0.858***
	(0.0329)	(0.0464)	(0.0367)	(0.0362)	(0.0387)	(0.0656)
Shanghai	-0.156***	-0.0129	-0.0541*	-0.124***	-0.222***	-0.321***
	(0.0296)	(0.0368)	(0.0309)	(0.0375)	(0.0430)	(0.0642)
Jiangsu	-0.450***	-0.335***	-0.327***	-0.401***	-0.522***	-0.572***
	(0.0298)	(0.0444)	(0.0323)	(0.0366)	(0.0418)	(0.0678)
Zhejiang	-0.252***	-0.151***	-0.159***	-0.198***	-0.330***	-0.386***
	(0.0300)	(0.0373)	(0.0364)	(0.0375)	(0.0416)	(0.0722)
Hubei	-0.535***	-0.375***	-0.427***	-0.471***	-0.641***	-0.754***
	(0.0324)	(0.0405)	(0.0408)	(0.0374)	(0.0418)	(0.0748)
Sichuan	-0.594***	-0.568***	-0.524***	-0.504***	-0.610***	-0.718***
	(0.0293)	(0.0449)	(0.0316)	(0.0378)	(0.0399)	(0.0676)
Constant	1.321***	0.697***	0.722***	0.963***	1.806***	2.031***
	(0.1751)	(0.1950)	(0.1771)	(0.2325)	(0.2727)	(0.4358)
Observations	5921	5921	5921	5921	5921	5921
R^2	0.403					

Table 4-19 OLS VS QR Wage effects of overeducation in urban sample

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0667***	0.0588***	0.0698***	0.0750***	0.0765***	0.0832***
	(0.0035)	(0.0052)	(0.0046)	(0.0054)	(0.0055)	(0.0078)
OVER	-0.124***	-0.133***	-0.151***	-0.105***	-0.103***	-0.0737
	(0.0286)	(0.0449)	(0.0326)	(0.0339)	(0.0375)	(0.0537)
UNDER	0.0764***	0.0166	0.0921***	0.111***	0.139***	0.157***
	(0.0273)	(0.0382)	(0.0329)	(0.0360)	(0.0375)	(0.0490)
male	0.177***	0.131***	0.177***	0.184***	0.171***	0.204***
	(0.0158)	(0.0205)	(0.0185)	(0.0181)	(0.0191)	(0.0314)
Married	0.0606**	0.0235	0.0495*	0.0350	0.0639**	0.0734
	(0.0251)	(0.0298)	(0.0270)	(0.0341)	(0.0279)	(0.0492)
Ethnicity	0.0444	0.0636	0.146	0.125	-0.0796	-0.0843
	(0.0764)	(0.0614)	(0.0903)	(0.1130)	(0.1160)	(0.2810)
age	0.0112	0.0129	0.0167**	0.0168*	0.00896	0.00924
	(0.0080)	(0.0095)	(0.0084)	(0.0096)	(0.0117)	(0.0149)
age^2	-0.000163*	-0.000199*	-0.000250**	-0.000224*	-0.000121	-0.0000983
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Tenure of current job	0.0260***	0.0225***	0.0243***	0.0281***	0.0289***	0.0298***
	(0.0030)	(0.0038)	(0.0035)	(0.0035)	(0.0039)	(0.0055)
Tenure squared	-0.000486***	-0.000446***	-0.000439***	-0.000475***	-0.000493***	-0.000578***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Agriculture, Forestry, Animal husbandry	0.375***	0.332**	0.291**	0.357***	0.358**	0.488*
	(0.0881)	(0.1371)	(0.1152)	(0.1089)	(0.1671)	(0.2561)
Manufacture, production and construction	0.0996***	0.0276	0.0861***	0.0807***	0.146***	0.127***
	(0.0228)	(0.0281)	(0.0261)	(0.0251)	(0.0291)	(0.0475)
Information Transmission and Transportation	0.176***	0.168***	0.163***	0.159***	0.199***	0.181***
	(0.0267)	(0.0336)	(0.0269)	(0.0299)	(0.0326)	(0.0534)
Business and Finance	0.268***	0.182***	0.194***	0.217***	0.265***	0.340***
	(0.0290)	(0.0340)	(0.0319)	(0.0371)	(0.0398)	(0.0885)
Public	0.243***	0.163***	0.214***	0.232***	0.271***	0.254***
	(0.0239)	(0.0343)	(0.0258)	(0.0248)	(0.0305)	(0.0490)
State	-0.0316*	-0.0142	0.00831	-0.0406*	-0.0386*	-0.0527
	(0.0186)	(0.0221)	(0.0210)	(0.0230)	(0.0220)	(0.0380)
Firm size 1 (1 to 5 employees)	-0.164***	-0.126**	-0.172***	-0.224***	-0.172***	-0.139*
	(0.0392)	(0.0537)	(0.0380)	(0.0497)	(0.0591)	(0.0820)
Firm size 2 (6 to 20 employees)	-0.146***	-0.149***	-0.114***	-0.159***	-0.130***	-0.139***
	(0.0233)	(0.0282)	(0.0265)	(0.0264)	(0.0282)	(0.0417)
Firm size 3 (21 to 99 employees)	-0.0387**	-0.0803***	-0.0511**	-0.0505**	-0.0147	0.0506
	(0.0184)	(0.0224)	(0.0226)	(0.0209)	(0.0233)	(0.0372)
Permanent	0.422***	0.490***	0.431***	0.398***	0.379***	0.287***
	(0.0320)	(0.0425)	(0.0349)	(0.0422)	(0.0481)	(0.0632)
Long term	0.247***	0.323***	0.247***	0.231***	0.234***	0.135**
	(0.0273)	(0.0317)	(0.0300)	(0.0334)	(0.0415)	(0.0560)
Short term	-0.0403	0.0833*	0.00543	-0.00938	-0.0727	-0.118
	(0.0430)	(0.0437)	(0.0402)	(0.0460)	(0.0595)	(0.0949)
Henan	-0.773***	-0.767***	-0.692***	-0.705***	-0.845***	-0.887***
	(0.0298)	(0.0422)	(0.0371)	(0.0366)	(0.0410)	(0.0740)
Anhui	-0.759***	-0.680***	-0.671***	-0.705***	-0.799***	-0.897***
	(0.0298)	(0.0389)	(0.0314)	(0.0362)	(0.0430)	(0.0620)
Chongqing	-0.623***	-0.461***	-0.492***	-0.570***	-0.714***	-0.837***
	(0.0329)	(0.0453)	(0.0362)	(0.0366)	(0.0421)	(0.0632)
Shanghai	-0.159***	-0.0259	-0.0660**	-0.135***	-0.241***	-0.320***
	(0.0297)	(0.0387)	(0.0302)	(0.0392)	(0.0441)	(0.0635)
Jiangsu	-0.447***	-0.330***	-0.337***	-0.410***	-0.505***	-0.569***
	(0.0298)	(0.0424)	(0.0328)	(0.0376)	(0.0437)	(0.0638)
Zhejiang	-0.255***	-0.159***	-0.173***	-0.206***	-0.349***	-0.412***
	(0.0299)	(0.0387)	(0.0354)	(0.0365)	(0.0415)	(0.0650)
Hubei	-0.533***	-0.380***	-0.414***	-0.476***	-0.637***	-0.760***
	(0.0323)	(0.0433)	(0.0406)	(0.0377)	(0.0407)	(0.0756)
Sichuan	-0.594***	-0.582***	-0.525***	-0.518***	-0.611***	-0.704***
	(0.0293)	(0.0462)	(0.0331)	(0.0380)	(0.0394)	(0.0653)
Constant	1.214***	0.650***	0.566***	0.864***	1.536***	1.882***
	(0.1768)	(0.2020)	(0.1839)	(0.2191)	(0.2813)	(0.4342)
Observations	5921	5921	5921	5921	5921	5921
R^2	0.405					

Table 4-20 OLS VS QR Wage effects of overeducation in urban male sample

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0727***	0.0655***	0.0714***	0.0823***	0.0813***	0.0908***
	(0.0047)	(0.0088)	(0.0064)	(0.0071)	(0.0071)	(0.0102)
OVER	-0.146***	-0.140**	-0.148***	-0.147***	-0.125***	-0.149**
	(0.0385)	(0.0605)	(0.0442)	(0.0460)	(0.0477)	(0.0689)
UNDER	0.108***	0.0260	0.0888*	0.157***	0.162***	0.202***
	(0.0362)	(0.0534)	(0.0473)	(0.0461)	(0.0560)	(0.0704)
Married	0.145***	0.0712	0.117***	0.106**	0.147***	0.238***
	(0.0375)	(0.0476)	(0.0378)	(0.0445)	(0.0417)	(0.0763)
Ethnicity	0.133	0.0966	0.272***	0.169	0.114	0.171
	(0.1048)	(0.0684)	(0.0949)	(0.1790)	(0.1528)	(0.3402)
age	0.0176	0.0237	0.0208*	0.0201	0.00776	0.000914
	(0.0111)	(0.0193)	(0.0108)	(0.0150)	(0.0162)	(0.0234)
age^2	-0.000249*	-0.000301	-0.000319**	-0.000275	-0.000111	-0.0000320
	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0003)
Tenure of current job	0.0262***	0.0306***	0.0312***	0.0277***	0.0311***	0.0253***
	(0.0040)	(0.0060)	(0.0046)	(0.0056)	(0.0051)	(0.0089)
Tenure squared	-0.000475***	-0.000634***	-0.000575***	-0.000451***	-0.000550***	-0.000427**
	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Agriculture, Forestry, Animal husbandry	0.505***	0.385**	0.564***	0.480***	0.558***	0.652**
	(0.1127)	(0.1642)	(0.1834)	(0.1473)	(0.1931)	(0.2580)
Manufacture, production and construction	0.131***	0.102**	0.151***	0.159***	0.194***	0.111*
	(0.0318)	(0.0500)	(0.0358)	(0.0388)	(0.0377)	(0.0645)
Information Transmission and Transportation	0.178***	0.237***	0.168***	0.168***	0.199***	0.143*
	(0.0353)	(0.0496)	(0.0342)	(0.0410)	(0.0444)	(0.0765)
Business and Finance	0.289***	0.253***	0.219***	0.292***	0.280***	0.263**
	(0.0427)	(0.0510)	(0.0493)	(0.0525)	(0.0533)	(0.1123)
Public	0.276***	0.229***	0.267***	0.272***	0.311***	0.258***
	(0.0346)	(0.0580)	(0.0405)	(0.0419)	(0.0429)	(0.0739)
State	-0.0603**	-0.0221	0.0111	-0.0402	-0.0733**	-0.144***
	(0.0256)	(0.0352)	(0.0318)	(0.0330)	(0.0366)	(0.0525)
Firm size 1 (1 to 5 employees)	-0.177***	-0.170**	-0.180***	-0.186**	-0.0900	-0.0712
	(0.0591)	(0.0785)	(0.0579)	(0.0776)	(0.1007)	(0.1336)
Firm size 2 (6 to 20 employees)	-0.116***	-0.156***	-0.0655*	-0.122***	-0.0918**	-0.0882
	(0.0338)	(0.0567)	(0.0354)	(0.0365)	(0.0459)	(0.0698)
Firm size 3 (21 to 99 employees)	-0.0412*	-0.0708**	-0.0119	-0.0481	-0.0238	0.0709
	(0.0248)	(0.0353)	(0.0304)	(0.0322)	(0.0329)	(0.0555)
Permanent	0.436***	0.444***	0.406***	0.448***	0.370***	0.392***
	(0.0457)	(0.0620)	(0.0547)	(0.0634)	(0.0653)	(0.0980)
Long term	0.313***	0.321***	0.279***	0.318***	0.273***	0.309***
	(0.0401)	(0.0500)	(0.0437)	(0.0512)	(0.0543)	(0.0872)
Short term	-0.0146	0.127	0.0257	0.0303	-0.0742	-0.0345
	(0.0648)	(0.1036)	(0.0651)	(0.0631)	(0.0847)	(0.1492)
Henan	-0.803***	-0.780***	-0.721***	-0.790***	-0.852***	-0.862***
	(0.0405)	(0.0659)	(0.0499)	(0.0514)	(0.0526)	(0.1048)
Anhui	-0.754***	-0.609***	-0.650***	-0.733***	-0.772***	-0.893***
	(0.0401)	(0.0716)	(0.0509)	(0.0488)	(0.0535)	(0.0890)
Chongqing	-0.621***	-0.422***	-0.475***	-0.600***	-0.713***	-0.864***
	(0.0456)	(0.0686)	(0.0552)	(0.0519)	(0.0515)	(0.0898)
Shanghai	-0.188***	-0.00472	-0.0692	-0.218***	-0.225***	-0.319***
	(0.0403)	(0.0619)	(0.0445)	(0.0558)	(0.0498)	(0.0897)
Jiangsu	-0.466***	-0.375***	-0.358***	-0.468***	-0.474***	-0.515***
	(0.0403)	(0.0658)	(0.0473)	(0.0570)	(0.0517)	(0.0946)
Zhejiang	-0.275***	-0.114*	-0.172***	-0.278***	-0.323***	-0.375***
	(0.0405)	(0.0598)	(0.0446)	(0.0530)	(0.0593)	(0.0884)
Hubei	-0.534***	-0.367***	-0.405***	-0.507***	-0.621***	-0.760***
	(0.0433)	(0.0613)	(0.0537)	(0.0530)	(0.0543)	(0.1039)
Sichuan	-0.551***	-0.487***	-0.478***	-0.523***	-0.591***	-0.639***
	(0.0399)	(0.0706)	(0.0445)	(0.0535)	(0.0592)	(0.0885)
Constant	1.003***	0.260	0.379	0.733**	1.370***	1.755***
	(0.2440)	(0.4044)	(0.2356)	(0.3439)	(0.3749)	(0.5875)
Observations	3307	3307	3307	3307	3307	3307
R^2	0.390					

Table 4-21 OLS VS QR Wage effects of overeducation in urban female sample

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0569***	0.0608***	0.0575***	0.0625***	0.0645***	0.0584***
	(0.0051)	(0.0084)	(0.0069)	(0.0079)	(0.0091)	(0.0116)
OVER	-0.0958**	-0.152**	-0.112**	-0.0721*	-0.0831	0.0261
	(0.0426)	(0.0665)	(0.0478)	(0.0401)	(0.0578)	(0.1020)
UNDER	0.0261	0.0279	0.0212	0.0520	0.0806	0.0755
	(0.0416)	(0.0588)	(0.0447)	(0.0553)	(0.0642)	(0.0822)
Married	-0.0164	0.00963	-0.0214	-0.0314	0.000955	-0.0461
	(0.0343)	(0.0440)	(0.0393)	(0.0331)	(0.0442)	(0.0730)
Ethnicity	-0.0548	-0.0221	0.0708	-0.0270	-0.0347	-0.0828
	(0.1116)	(0.1521)	(0.1633)	(0.1443)	(0.1702)	(0.4206)
age	-0.00527	0.00291	0.0109	0.0102	0.00775	0.00295
	(0.0122)	(0.0143)	(0.0141)	(0.0139)	(0.0166)	(0.0297)
age^2	0.0000410	-7.7E-05	-0.000178	-0.000167	-0.000130	-0.0000322
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0004)
Tenure of current job	0.0236***	0.0141**	0.0207***	0.0244***	0.0233***	0.0320***
	(0.0047)	(0.0065)	(0.0058)	(0.0054)	(0.0063)	(0.0088)
Tenure squared	-0.000428***	-0.00022	-0.000394**	-0.000366**	-0.000301	-0.000683***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Agriculture, Forestry, Animal husbandry	0.129	-0.118	0.190	0.0617	0.0643	0.391
	(0.1427)	(0.2562)	(0.1416)	(0.1665)	(0.2606)	(0.4971)
Manufacture, production and construction	0.0561*	-0.0312	0.0214	0.0105	0.0720	0.167**
	(0.0332)	(0.0401)	(0.0367)	(0.0352)	(0.0491)	(0.0834)
Information Transmission and Transportation	0.206***	0.168***	0.203***	0.205***	0.185***	0.187**
	(0.0431)	(0.0451)	(0.0471)	(0.0454)	(0.0526)	(0.0914)
Business and Finance	0.257***	0.124**	0.190***	0.163***	0.301***	0.377***
	(0.0392)	(0.0534)	(0.0437)	(0.0489)	(0.0542)	(0.0893)
Public	0.202***	0.130***	0.153***	0.188***	0.203***	0.224***
	(0.0332)	(0.0403)	(0.0380)	(0.0360)	(0.0510)	(0.0672)
State	0.00864	-0.0292	0.0246	-0.0123	0.00685	0.0540
	(0.0269)	(0.0315)	(0.0291)	(0.0272)	(0.0384)	(0.0588)
Firm size 1 (1 to 5 employees)	-0.157***	-0.199**	-0.181***	-0.218***	-0.141*	-0.164
	(0.0523)	(0.0785)	(0.0509)	(0.0549)	(0.0764)	(0.1414)
Firm size 2 (6 to 20 employees)	-0.168***	-0.142***	-0.153***	-0.157***	-0.162***	-0.213***
	(0.0322)	(0.0352)	(0.0365)	(0.0320)	(0.0427)	(0.0627)
Firm size 3 (21 to 99 employees)	-0.0469*	-0.0764**	-0.0948***	-0.0698**	-0.0523	0.0283
	(0.0272)	(0.0347)	(0.0337)	(0.0293)	(0.0386)	(0.0567)
Permanent	0.446***	0.504***	0.472***	0.430***	0.442***	0.250***
	(0.0458)	(0.0606)	(0.0521)	(0.0562)	(0.0744)	(0.0952)
Long term	0.194***	0.310***	0.220***	0.206***	0.183***	0.0292
	(0.0375)	(0.0391)	(0.0421)	(0.0429)	(0.0645)	(0.0814)
Short term	-0.0484	0.0777	-0.0234	-0.00460	-0.0453	-0.196*
	(0.0570)	(0.0552)	(0.0612)	(0.0591)	(0.0919)	(0.1152)
Henan	-0.746***	-0.750***	-0.657***	-0.612***	-0.839***	-0.886***
	(0.0437)	(0.0597)	(0.0505)	(0.0504)	(0.0704)	(0.1072)
Anhui	-0.775***	-0.684***	-0.701***	-0.651***	-0.868***	-0.905***
	(0.0445)	(0.0524)	(0.0446)	(0.0621)	(0.0786)	(0.0947)
Chongqing	-0.632***	-0.512***	-0.479***	-0.504***	-0.702***	-0.846***
	(0.0473)	(0.0724)	(0.0456)	(0.0532)	(0.0856)	(0.1021)
Shanghai	-0.121***	-0.021	-0.00813	-0.0298	-0.219***	-0.274***
	(0.0439)	(0.0500)	(0.0483)	(0.0517)	(0.0740)	(0.1002)
Jiangsu	-0.432***	-0.298***	-0.283***	-0.316***	-0.571***	-0.577***
	(0.0442)	(0.0504)	(0.0430)	(0.0511)	(0.0777)	(0.0941)
Zhejiang	-0.229***	-0.176***	-0.147***	-0.110**	-0.340***	-0.435***
	(0.0442)	(0.0461)	(0.0488)	(0.0530)	(0.0704)	(0.1115)
Hubei	-0.534***	-0.398***	-0.394***	-0.386***	-0.676***	-0.755***
	(0.0486)	(0.0663)	(0.0472)	(0.0567)	(0.0724)	(0.1001)
Sichuan	-0.651***	-0.672***	-0.565***	-0.482***	-0.677***	-0.750***
	(0.0428)	(0.0694)	(0.0437)	(0.0550)	(0.0713)	(0.0986)
Constant	1.852***	1.014***	1.036***	1.354***	1.822***	2.448***
	(0.2648)	(0.3302)	(0.3110)	(0.3328)	(0.3961)	(0.7342)
Observations	2614	2614	2614	2614	2614	2614
R^2	0.397					

Table 4-22 Wage returns to education by generations in urban sample

Variables	Model 1	Model 2	Model 3
Years of schooling	0.0565***	0.0564***	0.0652***
	(0.0027)	(0.0027)	(0.0079)
Old		0.0334	0.1778
		(0.0398)	(0.1290)
Old*Schooling			-0.0099
			(0.0084)
male	0.1758***	0.1757***	0.1763***
	(0.0158)	(0.0158)	(0.0158)
Married	0.0625**	0.0585**	0.0610**
	(0.0252)	(0.0256)	(0.0257)
Ethnicity	0.0439	0.0441	0.0419
	(0.0766)	(0.0766)	(0.0766)
age	0.0113	0.0056	0.0039
	(0.0080)	(0.0105)	(0.0106)
age^2	-0.0002*	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)
Tenure of current job	0.0262***	0.0261***	0.0263***
	(0.0030)	(0.0030)	(0.0030)
Tenure squared	-0.0005***	-0.0005***	-0.0005***
	(0.0001)	(0.0001)	(0.0001)
Agriculture, Forestry, Animal husbandry	0.3798***	0.3807***	0.3796***
	(0.0883)	(0.0883)	(0.0883)
Manufacture, production and construction	0.1072***	0.1075***	0.1069***
	(0.0227)	(0.0227)	(0.0227)
Information Transmission and Transportation	0.1857***	0.1859***	0.1848***
	(0.0267)	(0.0267)	(0.0267)
Business and Finance	0.2758***	0.2758***	0.2754***
	(0.0290)	(0.0290)	(0.0290)
Public	0.2576***	0.2577***	0.2578***
	(0.0237)	(0.0237)	(0.0237)
State	-0.0306	-0.0305	-0.0307*
	(0.0186)	(0.0186)	(0.0186)
Firm size 1 (1 to 5 employees)	-0.1617***	-0.1618***	-0.1605***
	(0.0392)	(0.0392)	(0.0393)
Firm size 2 (6 to 20 employees)	-0.1477***	-0.1478***	-0.1471***
	(0.0233)	(0.0233)	(0.0233)
Firm size 3 (21 to 99 employees)	-0.0358*	-0.0358*	-0.0357*
	(0.0184)	(0.0184)	(0.0184)
Permanent	0.4261***	0.4259***	0.4260***
	(0.0321)	(0.0321)	(0.0321)
Long term	0.2507***	0.2507***	0.2503***
	(0.0273)	(0.0273)	(0.0273)
Short term	-0.0413	-0.0409	-0.0415
	(0.0430)	(0.0430)	(0.0430)
Henan	-0.7765***	-0.7768***	-0.7760***
	(0.0298)	(0.0298)	(0.0298)
Anhui	-0.7624***	-0.7624***	-0.7617***
	(0.0298)	(0.0298)	(0.0298)
Chongqing	-0.6333***	-0.6333***	-0.6328***
	(0.0329)	(0.0329)	(0.0329)
Shanghai	-0.1555***	-0.1555***	-0.1557***
	(0.0296)	(0.0296)	(0.0296)
Jiangsu	-0.4504***	-0.4507***	-0.4505***
	(0.0298)	(0.0298)	(0.0298)
Zhejiang	-0.2515***	-0.2519***	-0.2524***
	(0.0300)	(0.0300)	(0.0300)
Hubei	-0.5347***	-0.5347***	-0.5339***
	(0.0324)	(0.0324)	(0.0324)
Sichuan	-0.5939***	-0.5940***	-0.5937***
	(0.0293)	(0.0293)	(0.0293)
Constant	1.3212***	1.4235***	1.3301***
	(0.1751)	(0.2134)	(0.2277)
Observations	5921	5921	5921
R^2	0.4026	0.4027	0.4028

Table 4-23 OLS VS QR Wage returns to education in urban sample (generations)

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0652***	0.0514***	0.0585***	0.0796***	0.0792***	0.0748***
	(0.0079)	(0.0160)	(0.0088)	(0.0099)	(0.0115)	(0.0145)
Old	0.178	0.0341	0.0356	0.306**	0.315*	0.324
	(0.1290)	(0.2335)	(0.1416)	(0.1531)	(0.1817)	(0.2529)
Old*Schooling	-0.00985	-0.0000556	-0.000662	-0.0195*	-0.0187	-0.0115
	(0.0084)	(0.0164)	(0.0095)	(0.0103)	(0.0118)	(0.0159)
male	0.176***	0.134***	0.160***	0.189***	0.184***	0.209***
	(0.0158)	(0.0207)	(0.0194)	(0.0186)	(0.0187)	(0.0296)
Married	0.0610**	0.0351	0.0379	0.0336	0.0865***	0.0675
	(0.0257)	(0.0293)	(0.0281)	(0.0347)	(0.0286)	(0.0465)
Ethnicity	0.0419	0.0823	0.193**	0.0918	-0.0813	-0.0429
	(0.0766)	(0.0606)	(0.0798)	(0.1091)	(0.1208)	(0.2883)
age	0.00389	0.00825	0.00922	0.0121	-0.00445	-0.0207
	(0.0106)	(0.0137)	(0.0111)	(0.0135)	(0.0162)	(0.0210)
age^2	-0.0000848	-0.000155	-0.000170	-0.000181	0.0000264	0.000225
	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
Tenure of current job	0.0263***	0.0223***	0.0254***	0.0290***	0.0300***	0.0248***
	(0.0030)	(0.0038)	(0.0035)	(0.0036)	(0.0039)	(0.0056)
Tenure squared	-0.000490***	-0.000446***	-0.000472***	-0.000497***	-0.000525***	-0.000489***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Agriculture, Forestry, Animal husbandry	0.380***	0.363***	0.281**	0.377***	0.363**	0.474*
	(0.0883)	(0.1346)	(0.1118)	(0.1074)	(0.1655)	(0.2617)
Manufacture, production and construction	0.107***	0.0323	0.0884***	0.0867***	0.143***	0.148***
	(0.0227)	(0.0271)	(0.0264)	(0.0254)	(0.0307)	(0.0457)
Information Transmission and Transportation	0.185***	0.176***	0.172***	0.157***	0.193***	0.223***
	(0.0267)	(0.0359)	(0.0281)	(0.0321)	(0.0323)	(0.0509)
Business and Finance	0.275***	0.191***	0.204***	0.229***	0.267***	0.345***
	(0.0290)	(0.0336)	(0.0320)	(0.0346)	(0.0392)	(0.0830)
Public	0.258***	0.195***	0.225***	0.242***	0.282***	0.275***
	(0.0237)	(0.0327)	(0.0258)	(0.0267)	(0.0287)	(0.0483)
State	-0.0307*	-0.0220	0.00652	-0.0410*	-0.0434**	-0.0462
	(0.0186)	(0.0228)	(0.0202)	(0.0221)	(0.0217)	(0.0394)
Firm size 1 (1 to 5 employees)	-0.161***	-0.140***	-0.164***	-0.199***	-0.137**	-0.156*
	(0.0393)	(0.0523)	(0.0386)	(0.0503)	(0.0578)	(0.0825)
Firm size 2 (6 to 20 employees)	-0.147***	-0.159***	-0.105***	-0.163***	-0.141***	-0.130***
	(0.0233)	(0.0287)	(0.0267)	(0.0265)	(0.0283)	(0.0422)
Firm size 3 (21 to 99 employees)	-0.0357*	-0.0845***	-0.0439*	-0.0446**	-0.0111	0.0481
	(0.0184)	(0.0224)	(0.0233)	(0.0214)	(0.0228)	(0.0379)
Permanent	0.426***	0.486***	0.451***	0.411***	0.389***	0.324***
	(0.0321)	(0.0430)	(0.0368)	(0.0426)	(0.0502)	(0.0642)
Long term	0.250***	0.311***	0.246***	0.258***	0.240***	0.176***
	(0.0273)	(0.0310)	(0.0301)	(0.0338)	(0.0432)	(0.0568)
Short term	-0.0415	0.0599	-0.00707	-0.00353	-0.0701	-0.0526
	(0.0430)	(0.0443)	(0.0381)	(0.0475)	(0.0616)	(0.0968)
Henan	-0.776***	-0.766***	-0.705***	-0.698***	-0.846***	-0.920***
	(0.0298)	(0.0430)	(0.0356)	(0.0351)	(0.0409)	(0.0704)
Anhui	-0.762***	-0.660***	-0.669***	-0.696***	-0.804***	-0.934***
	(0.0298)	(0.0387)	(0.0311)	(0.0358)	(0.0407)	(0.0651)
Chongqing	-0.633***	-0.462***	-0.486***	-0.576***	-0.724***	-0.891***
	(0.0329)	(0.0460)	(0.0371)	(0.0350)	(0.0392)	(0.0654)
Shanghai	-0.156***	-0.0157	-0.0576*	-0.122***	-0.215***	-0.332***
	(0.0296)	(0.0366)	(0.0314)	(0.0368)	(0.0430)	(0.0640)
Jiangsu	-0.450***	-0.337***	-0.326***	-0.401***	-0.519***	-0.579***
	(0.0298)	(0.0454)	(0.0323)	(0.0359)	(0.0422)	(0.0680)
Zhejiang	-0.252***	-0.151***	-0.159***	-0.208***	-0.328***	-0.423***
	(0.0300)	(0.0371)	(0.0373)	(0.0362)	(0.0400)	(0.0701)
Hubei	-0.534***	-0.371***	-0.429***	-0.474***	-0.636***	-0.751***
	(0.0324)	(0.0415)	(0.0400)	(0.0366)	(0.0410)	(0.0742)
Sichuan	-0.594***	-0.570***	-0.527***	-0.511***	-0.597***	-0.735***
	(0.0293)	(0.0444)	(0.0312)	(0.0372)	(0.0390)	(0.0668)
Constant	1.330***	0.789**	0.794***	0.859***	1.683***	2.467***
	(0.2277)	(0.3326)	(0.2245)	(0.2841)	(0.3726)	(0.5234)
Observations	5921	5921	5921	5921	5921	5921
R^2	0.403					

Chapter 5 Conclusions

5.1 Summary of the Thesis

This thesis focuses on the exploration of overeducation in the Chinese labour market in three aspects. Chapter 2 provides an overview of the phenomenon of overeducation in China. Chapter 3 investigates the relationship between overeducation and job satisfaction based on the point of view of productivity. Chapter 4 examines the wage return to education and wage effects of overeducation in segmented labour markets in urban China. The main conclusions from each chapter will be discussed below. At the end of this section, policy implications and recommendations for future work are highlighted.

Chapter 2 (Research question 1) provides a longitudinal analysis of overeducation over the period from 1989 to 2009 to explore whether the stylised patterns of overeducation regarding the incidence of overeducation, the determinants of and wage effects of overeducation are found in China. First, based on the realised matches (RM) method, about 18.19% of workers in our sample are treated as overeducated and 20.33% employees have deficit education in the mean index. While using the mode index, the incidence of overeducation is 26.10% and about 30.16% of workers are estimated as undereducated. The incidence of overeducation and undereducation found in this chapter are similar with other studies about overeducation in China (21% in Yang and Yue (2005), 20.5% in Mayston and Yang (2008) and 27.3% in Ren and Miller (2012), even though they have different methods to define overeducation and use different datasets. In addition, compared to the extent of overeducation in Chapter 3 (23.1% using the mode index) and Chapter 4 (16.69% for migrant workers and 10.72% for urban residents using the mean index), results in this chapter are slightly higher. Based on the above evidence, we can infer that the incidence of overeducation in China is somewhere between 20% and 30% regardless of the measurement of required education used.

Results indicate that in both indexes, males are more likely to be overeducated than females and individuals who have an urban registration are more likely to be estimated as overeducated than people with rural registration. In addition, individuals who have less experience are more likely to be estimated as overeducated, which confirms the human capital theory that there is a potential trade-off between schooling and other kinds of human capital. However, this result is only found in the mean index. Temporary workers tend to be overeducated in both indexes and workers in the private sector are more likely to be overeducated than individuals in the government sector in both indexes.

In terms of the wage effects of overeducation in the pooled OLS regression, the results in Chapter 2 are from two equations (ORU and VV equations). Both the mean index and mode index produce results that are consistent with literature. After taking time effects into consideration, although time effects change the magnitude of wage effects, the pattern of estimation results are still consistent with previous findings that educational mismatch causes wage differentials. When taking unobserved heterogeneity into account, empirical results in this chapter indicate that the wage penalty of overeducation becomes smaller or even disappears, which can be confirmed by the mode index in the VV equation. In all, the results from Chapter 2 suggest that the stylised patterns of overeducation in the literature are present in the Chinese labour market.

In addition, there are some specific features of the wage effects of overeducation in China indicated in this chapter. The exploration of wage effects of overeducation by wave suggests that there are increasing wage returns to overeducation over time in China. This may be explained by the economic transition and its following changes in the labour market and education system. In addition, different wage effects of overeducation by age groups may be explained by the changes in Post-Mao and Mao education systems to some extent.

Chapter 3 (Research question 2) investigates detailed relationships among educational mismatch, skill mismatch and job satisfaction in China. First, according to the summary statistics in the sample, overeducated people report the highest job satisfaction level among the three groups (overeducated, undereducated and correctly educated). When exploring relationships between educational mismatch and overall job satisfaction and aspects of job satisfaction without taking skill mismatch into consideration, results indicate that overeducated people are more satisfied with their workload, working conditions and facilities, their relationship with colleagues and housing benefits compared to workers who work in similar jobs who are correctly educated. In terms of overall job satisfaction, there is no evidence from the ordered probit model that overeducated individuals are more likely to report low job satisfaction. Two reasons can explain the above results. The first is that there may be compensating aspects of the job that make overeducated people choose a job lower than their educational attainment to achieve a balanced tradeoff between work and leisure. The second is that overeducated people may choose to stay in a job beneath their level of education due to their own preference for one or more characteristics of the job.

When educational mismatch and skill mismatch are included simultaneously into the analysis of job satisfaction, empirical results suggest that skill mismatch has a consistently stronger negative effect on overall job satisfaction and many facets of job satisfaction except for job satisfaction with welfare, workload and commuting distance to job location than educational mismatch. It seems that skill mismatch may undermine job satisfaction within institutions. This result is also consistent with the recent literature that focuses on skill mismatch.

Chapter 4 (Research question 3) depicts the wage effects of schooling and wage effects of overeducation and undereducation for rural-to-urban migrant workers and urban residents who are segmented in the urban labour market in China. Empirical results show that the new generation of migrant workers have a higher wage returns to schooling than the old generation of migrant workers. Improved rural educational attainment and school quality, and relaxed restrictions on migrant workers entering the urban labour market may lead to the higher wage returns to schooling for the new generation of migrant workers. Based on results in the quantile regression, the new generation migrant workers have higher wage returns to schooling than the old generation migrant workers in the low and middle part of the wage distribution (10^{th}, 25^{th} and 50^{th} percentile). Although we are unable to make a further in-depth analysis of the wage structure between the old and new generation of migrant workers, we speculate that a shift from manufacturing and construction industry to service sectors (wholesale and retail trade, hotel and catering and other service) between two generations may lead to such different wage effects of schooling. In addition, the wage return to schooling of migrant workers (around 3 per cent) is lower than that of urban residents (6 per cent). The segmented labour market caused by the Household Registration System (*Hukou*) is the main cause that explains the disparity of wage returns to schooling between urban residents and migrant workers.

In terms of educational mismatch, there is no significant wage effect of overeducation for migrant workers and positive wage premiums of undereducation can be enjoyed by migrant workers. Based on a distributional analysis, undereducated migrant workers in the old generation enjoy higher wage premiums of undereducation at the middle quantiles (25^{th} and 75^{th}). Overeducated workers in the old generation have higher wage effects of overeducation at the 90^{th} quantile of the wage distribution. The wage effects of educational mismatch for urban workers are consistent with the existing literature. Different wage effects of educational mismatch between urban residents and rural migrant workers are presented, which support the notion of the two-tier labour market in urban China (Meng and Zhang, 2001). Informal job search in the migrant groups is an important reason to explain the educational mismatch of rural-to-urban migrant workers. Another reason is the inferior jobs undertaken by some migrant workers that require proficiency and are paid by piecework. Skills and relevant working experience are more related to wages than educational level in those jobs. Therefore, it is easy to understand the insignificant wage effects of overeducation for migrant workers.

5.2 Policy implications

It should be mentioned that although this thesis cannot be treated as evidence for policy making, it can offer some information to policy makers. Given the empirical findings in this thesis, enhancing skills to commensurate with the market needs, increasing the investment in rural education and further removing barriers from Hukou system should be importantly highlighted.

Regarding the current situation in China, the growth rate of GDP has begun to decrease gradually since 2010 and the latest figure is 6.8% in the fourth quarter of 2015 (Wall Street Journal, 19 January, 2016). At the same time, China is experiencing significant structural changes in the economy[147]. Service sectors (Tertiary industry) are

[147] Industry classifications in China can be seen in Chapter 4.

expanding, while shares of the first industry and second industry are declining. Based on statistic from the National Bureau of Statistics, the proportion of service sectors account for the total amount of GDP in China increased from 34.3% in 1990 to 48.2% in 2014. About 40% of the total employment comes from the service sector (Lam et al., 2015). According to *China's 13th Five-Year Plan (2016-2020)*, the main task for the government is to develop a services-dominated industrial structure[148]. The service sector will become the key engine of economic development in China and newly created jobs will mainly come from the service sector in the future. Most jobs in the service sector are skills-based, especially in those called "new" service sectors, such as communications, business and finance, and research (Wu, 2007). Therefore, given the above conditions, the match between job and worker is vital for economic development and to maintain the stability of the labour market in China. Empirical findings that unobserved heterogeneity plays an important role in determining the wage effects of overeducation in Chapter 2 and significant negative effects of skill mismatch on job satisfaction and facets of job satisfaction in Chapter 3 all indicate that the government should make more effort to ensure that skills offered in the labour market should be in line with the market needs. That is to say, the government should ensure that the job-worker match mechanism conduct in a way that can effectively use of employees' skills to increase productivity. Reforming higher education to adapt to the labour market needs, enhancing the development of vocational education and training, work-related training and improving information dissemination and career guidance all can bring benefits to the society and help to improve the job-worker match efficiency in the labour market, in order to keep sustained economic growth in China.

As China's urbanization program expands and there is a decline in the number of urban working population due to the one child policy[149], rural-to-urban migrant workers, especially the new generation of migrant workers, will become the main labour force in the Chinese labour market. This implies that the level of overall human capital in the country will be determined by the human capital of the rural labour force in the future. The exploration of rural-to-urban migrant workers is a key to understand

[148] http://www.chinadaily.com.cn/china/13thfiveyearplan/2016-02/26/content_23652904.htm

[149] One-child policy in rural area is more loosened in rural China than in urban China (Peng, 1991). More special conditions allowing the second child are applied in rural areas than the urban areas. Meng (2012) argues that one-child policy has fewer effects on fertility rate in rural China than in urban China.

the Chinese labour market. Empirical findings in Chapter 4 indicate that enhancing rural education and providing more job-specific skill training and vocational education in the rural area, alongside further relaxation of the restrictions caused by the “Hukou” system are vital for the China’s economic growth.

5.3 Research limitations

Despite the limitations stated in each chapter, there are still two further limitations that need to be addressed in this section. First, this thesis doesn’t provide empirical models to explore whether overeducation is a long run or temporary phenomenon in China. If overeducation is a short-run phenomenon, it may not be a threat to the economy and this temporary mismatch will be relieved in the end when overeducated individuals move to higher levels of jobs that are matched with their educational attainment. However, if overedcuation is a long run phenomenon, regarding its negative impacts on the labour market, it should be considered in depth in the future analysis. According to the low within-group standard deviation in the fixed effects model in Chapter 2, overeducation may be a long run phenomenon in China.

Second, unfortunately, there is no analysis of overeducation by subjects of graduates in this thesis due to data limitations. As stated in the introduction part, about 31% university graduates and 38% vocational college graduates fail to find jobs that are matched with their majors in China. In addition, unemployment rates of graduates differ by majors. According to Molnar et al. (2015), graduates majoring in physics, biology and biotechnology find it easier to secure a position than those graduates whose majors are in the Arts and design and social science. The evidence above indicates that there may be different effects of overeducation across majors in China. Frenette (2004) argues that exploring overeducation by majors offers more practical implications to students and policy makers. If data about majors becomes available in the future, exploring overeducation across majors will provide useful guidance to help reform Chinese higher education system to the market needs.

If comprehensive data on majors, skill category and school quality are available in the future, the exploration of overeducation will provide more practical implications to policy makers and society.

Appendix A

Table A 1 GDP growth rate and the number of college enrollment

Year	GDP growth rate (%)	The number of college enrollment (million)	Growth rate of college enrollment (%)
1998	7.8	1.08	8.00
1999	7.6	1.55	43.52
2000	8.4	2.21	42.58
2001	8.3	2.68	21.27
2002	9.1	3.21	19.78
2003	10	3.82	19.00
2004	10.1	4.47	17.02
2005	11.3	5.04	12.75
2006	12.7	5.46	8.33
2007	14.2	5.66	3.67
2008	9.6	6.08	7.42
2009	9.2	6.39	5.10
2010	10.4	6.62	3.60
2011	9.3	6.82	3.02

Source: Chinese statistical database

Table A 2 CPI and average monthly wage in China

	1989	1991	1993	1997	2000	2004	2006	2009
CPI (1989=100)	100	106.6	130.1	210.5	206.8	217.2	224.4	247.3
Average monthly wage (Yuan)	161.25	195.0	280.9	539.2	777.8	1326.7	1738.0	2687.0

Source: Chinese statistical database.

Table A 3 Occupations in CHNS

	Occupations	Number
1	Senior professional/technical	1339 (7.54%)
2	Junior professional/technical	1562 (8.79%)
3	Administrator/ executive/ manager	1857 (10.45%)
4	Office staff	1925 (10.84%)
5	Farmer, fisherman, hunter	213 (1.20%)
6	Skilled worker	3170 (17.84%)
7	Non-skilled worker	4665 (26.26%)
8	Army officer, police officer	65 (0.37%)
9	Ordinary soldier, policeman	121 (0.68%)
10	Driver	425 (2.39%)
11	Service worker	1946 (10.95%)
12	Athlete, actor, musician	80 (0.45%)
13	Other	398 (2.24%)
	Total	17766 (100.00%)

Table A 4 Aggregate occupation category

Category	Occupations	Number
Clerk	Office staff, ordinary soldier and policeman	2046
Junior	Junior professional/technical worker, skilled worker and driver	5157
Senior	Senior professional/ technical worker	1339
Leader	Administrator/executive/manager or an army officer, police officer	1922
Other	Athlete, actor, musician or other	478
Unskilled	Service worker, farmer, fisherman, hunter or non-skilled worker	6824
Total		17766

Table A 5 The distribution of highest educational level by groups

Group	Master's degree or higher	University or college degree	Technical or vocational	Upper middle school	Lower middle school	Primary school or less
Post-Mao education	2 (0.06%)	469 (13.93%)	564 (16.75%)	650 (19.30%)	1398 (41.51%)	285 (8.46%)
Mao education	24 (0.17%)	1251 (8.69%)	1542 (10.71%)	3440 (23.89%)	5147 (35.75%)	2994 (20.79%)

Table A 6 Definitions of variables

Variable	Definitions
Dependent variables	
Log of monthly wages	Natural logarithm of average monthly wages last year (without any subsides and bonuses)
Independent variables	
Years of schooling (CEDU)	Actual completed years of schooling
Years of required schooling (REDU)	The mean value of years of schooling in a specific occupation and a given wave
Years of overeducation (OEDU)	Years of schooling above the required years of schooling within an occupation and a given wave
Years of undereducation (UEDU)	Years of schooling below the required years of schooling within an occupation and a given wave
Overeducated (OVER)	OVER=1 if overeducated and OVER=0 if otherwise
Undereducated (UNDER)	UNDER=1 if undereducated and UNDER=0 if otherwise
Female (Female)	Female=1 if females, and Female=0 if males
Urban registration (UR)	UR=1 if urban registration; UR=0 if rural registration
Age	Age of individuals
Experience (Exper)	This variable is the maximum potential years of work experience=age-education-6
Experience squared (Exper squared)	Experience squared
Ownership: reference group (Government sector)	
Government sector (Gov)	Gov=1 if an individual works in a government, state service/institute or state-owned enterprise and Gov=0 if otherwise
Private sector (Pri)	Pri=1 if an individual works in a family contract farming, private, individual enterprise or three-capital enterprise and Pri=0 if otherwise
Collective sector (Collective)	Collective=1 if an individual works in small and large collective enterprises and Collective=0 if otherwise
Unknown ownership (Unknown1)	Unknown1=1 if type of work unit is unknown and Unknown1=0 if otherwise
Educational attainment: reference group (Primary school or less)	
Primary school or less (Edu1)	Edu1=1 if individual’s highest level of education is primary school degree or less and Edu1=0 if otherwise
Lower middle school (Edu2)	Edu2=1 if individual’s highest level of education is lower middle school degree and Edu2=0 if otherwise
Upper middle school (Edu3)	Edu3=1 if individual’s highest level of education is upper middle school degree and Edu3=0 if otherwise
Technical or vocational degree (Edu4)	Edu4=1 if individual’s highest level of education is technical or vocational degree and Edu4=0 if otherwise
University or college degree (Edu5)	Edu5= 1 if individual’s highest level of education is university or college degree and Edu5=0 if otherwise
Master’s degree or higher degree (Edu6)	Edu6=1 if individual’s highest level of education is master’s degree or higher and Edu6=0 if otherwise
Economic region: reference group (West)	
Northeast	Northeast=1 if Province: Liaoning, Heilongjiang and Northeast=0 if otherwise
Central	Central=1 if Province: Henan, Hubei, Hunan and Central=0 if otherwise
East	East=1 if Province: Shandong, Jiangsu and East=0 if otherwise
West	West =1 if Province: Guangxi and Guizhou and West=0 if otherwise
Firm size: reference group (Firm size 1)	
Firm size 1 (more than 100 employees)	Firmsize1=1 if the number of employees in the work unit is more than 100 and Firmsize1=0 if otherwise
Firm size 2 (between 20 and 100 employees)	Firmsize2=1 if the number of employees in the work unit is between 20 and 100 and Firmsize2=0 if otherwise
Firm size 3 (less than 20 employees)	Firmsize3=1 if the number of employees in the work unit is less than 20 and Firmsize3=0 if otherwise
Unknown firm size (Firmsize4)	Firmsize4=1 if the number of employees in the work unit is unknown and Firmsize4=0 if otherwise
Job type: reference group (Permanent)	
Permanent	Permanent=1 if works for another person or enterprises as permanent employee, and Permanent=0 if otherwise
Contractor	Contractor=1 if contractor with other people or enterprise, and Contractor=0 if otherwise
Temporary	Temporary=1 if temporary workers, and Temporary=0 if otherwise
Other	Other=1 if job type is paid family workers, unpaid family workers, other and unknown and Other=0 if otherwise
Aggregate occupations: reference group (Unskilled)	
Clerk	Clerk=1 if the individual works as an office staff or an ordinary soldier, policeman, and Clerk=0 if otherwise
Junior	Junior=1 if the individual works as a junior professional/technical worker, skilled worker or driver, and Junior=0 if otherwise
Senior	Senior=1 if the individual works as a senior professional/technical worker and Senior=0 if otherwise
Leader	Leader=1 if the individual works as an administrator/executive/manager or an army officer, police officer and Leader=0 if otherwise
Other	Other=1 if the individual’s work is athlete, actor, musician and other and Other=0 if otherwise
Unskilled	Unskilled=1 if the individual’s work is service workers, farmer, fisherman, hunter or non-skilled workers and Unskilled=0 if otherwise

Table A7 Wage effects of overeducation (ORU) ----- mean index VS mode index

	The mean index				The mode index			
Variables	Pooled OLS (1)	Pooled OLS with time effects (2)	Fixed effects (3)	Random effects (4)	Pooled OLS (5)	Pooled OLS with time effects (6)	Fixed effects (7)	Random effects (8)
Wage return to required education	0.2324***	0.0280***	0.0175*	0.0271***	0.2620***	0.0773***	0.0555***	0.0787***
	(0.0062)	(0.0060)	(0.0097)	(0.0060)	(0.0079)	(0.0070)	(0.0183)	(0.0071)
Wage return to overeducation	0.0298***	0.0257***	0.0183***	0.0260***	0.0968***	0.0394***	0.0452**	0.0457***
	(0.0040)	(0.0034)	(0.0067)	(0.0033)	(0.0083)	(0.0073)	(0.0179)	(0.0072)
Wage return to undereducation	-0.0382***	-0.0209***	-0.0076	-0.0223***	-0.1319***	-0.0808***	-0.0268	-0.0741***
	(0.0045)	(0.0041)	(0.0082)	(0.0039)	(0.0100)	(0.0087)	(0.0188)	(0.0079)
Female	-0.2128***	-0.1700***		-0.1876***	-0.1960***	-0.1727***		-0.1908***
	(0.0106)	(0.0096)		(0.0106)	(0.0106)	(0.0095)		(0.0105)
Urban registration	0.0591***	0.0599***		0.0510***	0.0491***	0.0574***		0.0477***
	(0.0104)	(0.0095)		(0.0106)	(0.0105)	(0.0095)		(0.0105)
Experience	0.0230***	0.0168***	0.0151**	0.0185***	0.0247***	0.0169***	0.0176**	0.0188***
	(0.0018)	(0.0016)	(0.0074)	(0.0015)	(0.0018)	(0.0016)	(0.0082)	(0.0015)
Experience squared	-0.0003***	-0.0003***	-0.0006***	-0.0003***	-0.0003***	-0.0002***	-0.0006***	-0.0003***
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Private sector	0.4126***	0.0422**	-0.0977***	-0.0032	0.4780***	0.0567***	-0.0923***	0.0114
	(0.0175)	(0.0177)	(0.0219)	(0.0152)	(0.0179)	(0.0177)	(0.0219)	(0.0153)
Collective sector	0.3156***	0.1563***	-0.0192	0.1016***	0.3357***	0.1657***	-0.0193	0.1096***
	(0.0191)	(0.0192)	(0.0203)	(0.0149)	(0.0193)	(0.0191)	(0.0203)	(0.0149)
Unknown ownership	0.3425***	0.0034	0.0245	-0.0065	0.4027***	0.0120	0.0250	-0.0003
	(0.0480)	(0.0434)	(0.0394)	(0.0299)	(0.0483)	(0.0433)	(0.0394)	(0.0299)
Firm size 2 (between 20 and 100 employees)	0.0204	0.0179	-0.0017	0.0108	0.0366**	0.0134	-0.0037	0.0063
	(0.0148)	(0.0128)	(0.0162)	(0.0125)	(0.0152)	(0.0128)	(0.0162)	(0.0124)
Firm size 3 (less than 20 employees)	-0.2131***	-0.1592***	-0.1000***	-0.1430***	-0.1934***	-0.1591***	-0.1038***	-0.1449***
	(0.0191)	(0.0178)	(0.0209)	(0.0150)	(0.0193)	(0.0177)	(0.0209)	(0.0150)
Unknown firm size	-0.7458***	0.0068	0.0395	0.0105	-0.8447***	0.0082	0.0403	0.0111
	(0.0145)	(0.0279)	(0.0334)	(0.0236)	(0.0139)	(0.0278)	(0.0334)	(0.0236)
Contractor	0.1248***	0.0267	-0.0163	0.0194	0.1399***	0.0319*	-0.0148	0.0235*
	(0.0179)	(0.0166)	(0.0186)	(0.0141)	(0.0183)	(0.0165)	(0.0186)	(0.0141)
Temporary	0.0244	-0.1259***	-0.0970***	-0.1150***	0.0469**	-0.1198***	-0.0941***	-0.1088***
	(0.0197)	(0.0178)	(0.0227)	(0.0160)	(0.0203)	(0.0178)	(0.0227)	(0.0161)

Other job type	-0.0598	-0.0808**	-0.0168	-0.0587**	-0.0402	-0.0770**	-0.0159	-0.0570**
	(0.0411)	(0.0365)	(0.0330)	(0.0262)	(0.0421)	(0.0362)	(0.0330)	(0.0262)
Clerk	-0.2937***	0.0721***	0.0288	0.0537***	-0.0368**	0.0692***	0.0253	0.0479***
	(0.0188)	(0.0176)	(0.0229)	(0.0180)	(0.0162)	(0.0144)	(0.0190)	(0.0149)
Junior	-0.1395***	0.0945***	0.0268*	0.0665***	0.0311**	0.0921***	0.0271**	0.0641***
	(0.0137)	(0.0131)	(0.0151)	(0.0120)	(0.0122)	(0.0110)	(0.0129)	(0.0102)
Senior	-0.5066***	0.1864***	0.0782**	0.1517***	-0.1228***	0.1570***	0.0668**	0.1245***
	(0.0315)	(0.0278)	(0.0356)	(0.0278)	(0.0272)	(0.0220)	(0.0292)	(0.0222)
Leader	-0.2849***	0.1092***	0.0714***	0.0782***	-0.0422**	0.1052***	0.0662***	0.0713***
	(0.0218)	(0.0207)	(0.0251)	(0.0191)	(0.0199)	(0.0183)	(0.0217)	(0.0163)
Other	0.0029	0.0782***	0.0562*	0.0635***	0.1133***	0.0846***	0.0622**	0.0701***
	(0.0328)	(0.0288)	(0.0313)	(0.0242)	(0.0331)	(0.0288)	(0.0313)	(0.0241)
Northeast	0.0496***	0.0386***		0.0419**	0.0593***	0.0378***		0.0398**
	(0.0163)	(0.0144)		(0.0166)	(0.0163)	(0.0143)		(0.0166)
Central	0.0229	0.0341***		0.0323**	0.0204	0.0337***		0.0321**
	(0.0146)	(0.0131)		(0.0147)	(0.0147)	(0.0131)		(0.0146)
East	0.1341***	0.1360***		0.1143***	0.1288***	0.1394***		0.1174***
	(0.0147)	(0.0135)		(0.0146)	(0.0147)	(0.0135)		(0.0146)
Year 1991		0.1063***	0.1524***	0.1119***		0.1107***	0.1509***	0.1154***
		(0.0114)	(0.0178)	(0.0118)		(0.0112)	(0.0185)	(0.0116)
Year 1993		0.2461***	0.3140***	0.2500***		0.2446***	0.3018***	0.2472***
		(0.0139)	(0.0293)	(0.0128)		(0.0137)	(0.0319)	(0.0125)
Year 1997		0.7291***	0.8948***	0.7376***		0.7290***	0.8772***	0.7368***
		(0.0306)	(0.0647)	(0.0257)		(0.0303)	(0.0693)	(0.0255)
Year 2000		1.0704***	1.2792***	1.0798***		1.0725***	1.2571***	1.0813***
		(0.0311)	(0.0828)	(0.0265)		(0.0306)	(0.0895)	(0.0257)
Year 2004		1.3285***	1.6654***	1.3564***		1.3215***	1.6292***	1.3477***
		(0.0332)	(0.1074)	(0.0292)		(0.0321)	(0.1185)	(0.0277)
Year 2006		1.4958***	1.8652***	1.5219***		1.4821***	1.8135***	1.5053***
		(0.0343)	(0.1197)	(0.0301)		(0.0330)	(0.1322)	(0.0285)
Year 2009		1.8133***	2.2521***	1.8443***		1.8024***	2.1918***	1.8291***
		(0.0347)	(0.1389)	(0.0303)		(0.0331)	(0.1539)	(0.0283)
Constant	3.0029***	3.8767***	4.0800***	3.9146***	4.5009***	3.9699***	4.0788***	3.9936***
	(0.0633)	(0.0615)	(0.1513)	(0.0581)	(0.0327)	(0.0393)	(0.1403)	(0.0354)
Observations	17766	17766	17766	17766	17766	17766	17766	17766
r^2	0.5588	0.6510	0.5964		0.5440	0.6525	0.5966	

Table A8 Wage effects of overeducation (ORU) by groups -----The mean index

	Post-Mao education				Mao education			
Variables	**Pooled OLS (1)**	**Pooled OLS with time effects (2)**	**Fixed effects (3)**	**Random effects (4)**	**Pooled OLS (5)**	**Pooled OLS with time effects (6)**	**Fixed effects (7)**	**Random effects (8)**
Wage return to required education	0.2550***	0.0509***	0.0472	0.0455***	0.2038***	0.0211***	0.0138	0.0214***
	(0.0127)	(0.0144)	(0.0296)	(0.0141)	(0.0070)	(0.0066)	(0.0104)	(0.0067)
Wage return to overeducation	0.0683***	0.0328***	0.0251	0.0364***	0.0319***	0.0287***	0.0185**	0.0283***
	(0.0083)	(0.0075)	(0.0182)	(0.0071)	(0.0045)	(0.0039)	(0.0072)	(0.0038)
Wage return to undereducation	-0.0802***	-0.0413***	-0.0110	-0.0448***	-0.0396***	-0.0192***	-0.0074	-0.0203***
	(0.0120)	(0.0112)	(0.0299)	(0.0107)	(0.0048)	(0.0045)	(0.0086)	(0.0042)
Female	-0.2258***	-0.1576***		-0.1707***	-0.2094***	-0.1768***		-0.1970***
	(0.0230)	(0.0210)		(0.0210)	(0.0118)	(0.0108)		(0.0122)
Urban registration	0.0531**	0.0462**		0.0292	0.0580***	0.0608***		0.0563***
	(0.0235)	(0.0214)		(0.0220)	(0.0115)	(0.0105)		(0.0120)
Experience	0.0647***	0.0436***	-0.0068	0.0419***	0.0390***	0.0288***	0.0234***	0.0316***
	(0.0075)	(0.0070)	(0.0230)	(0.0067)	(0.0024)	(0.0022)	(0.0080)	(0.0021)
Experience squared	-0.0012***	-0.0016***	-0.0006	-0.0015***	-0.0005***	-0.0004***	-0.0007***	-0.0005***
	(0.0003)	(0.0003)	(0.0005)	(0.0003)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Private sector	0.4309***	0.1462***	0.1050**	0.1196***	0.3375***	-0.0066	-0.1402***	-0.0564***
	(0.0291)	(0.0307)	(0.0489)	(0.0275)	(0.0216)	(0.0218)	(0.0246)	(0.0185)
Collective sector	0.3145***	0.2031***	0.0700	0.1644***	0.2894***	0.1314***	-0.0438*	0.0702***
	(0.0333)	(0.0324)	(0.0459)	(0.0283)	(0.0234)	(0.0241)	(0.0228)	(0.0177)
Unknown ownership	0.3591***	0.1466**	0.1103	0.1248**	0.2729***	-0.0447	0.0061	-0.0485
	(0.0795)	(0.0718)	(0.0951)	(0.0592)	(0.0561)	(0.0523)	(0.0435)	(0.0345)
Firm size 2 (between 20 and 100 employees)	-0.0270	-0.0154	-0.0390	-0.0219	0.0450**	0.0306**	0.0053	0.0232
	(0.0266)	(0.0243)	(0.0393)	(0.0240)	(0.0175)	(0.0150)	(0.0178)	(0.0145)
Firm size 3 (less than 20 employees)	-0.1610***	-0.1473***	-0.1922***	-0.1519***	-0.2061***	-0.1616***	-0.0832***	-0.1380***
	(0.0321)	(0.0298)	(0.0488)	(0.0275)	(0.0234)	(0.0221)	(0.0232)	(0.0179)
Unknown firm size	-0.3653***	0.0399	-0.0268	0.0259	-0.7450***	-0.0480	0.0418	-0.0294
	(0.0346)	(0.0404)	(0.0645)	(0.0375)	(0.0162)	(0.0384)	(0.0393)	(0.0305)
Contractor	0.1574***	0.0614**	-0.0438	0.0416*	0.0699***	-0.0090	-0.0035	-0.0057
	(0.0266)	(0.0244)	(0.0361)	(0.0238)	(0.0231)	(0.0222)	(0.0218)	(0.0177)

Temporary	0.0619**	-0.0765***	-0.1061**	-0.0788***	-0.0142	-0.1538***	-0.0943***	-0.1342***
	(0.0300)	(0.0278)	(0.0453)	(0.0272)	(0.0247)	(0.0233)	(0.0263)	(0.0200)
Other job type	0.0291	-0.0508	0.1305	-0.0269	-0.0945**	-0.0807**	-0.0379	-0.0611**
	(0.0912)	(0.0856)	(0.0853)	(0.0587)	(0.0441)	(0.0400)	(0.0360)	(0.0292)
Clerk	-0.2247***	0.0968**	-0.0084	0.0937**	-0.2635***	0.0674***	0.0324	0.0457**
	(0.0492)	(0.0480)	(0.0751)	(0.0451)	(0.0199)	(0.0187)	(0.0241)	(0.0196)
Junior	-0.0958***	0.0958***	0.0267	0.0898***	-0.1125***	0.0960***	0.0276*	0.0628***
	(0.0325)	(0.0315)	(0.0436)	(0.0285)	(0.0151)	(0.0144)	(0.0161)	(0.0133)
Senior	-0.1887***	0.2799***	0.0440	0.2384***	-0.4432***	0.1839***	0.0817**	0.1457***
	(0.0713)	(0.0679)	(0.1235)	(0.0723)	(0.0346)	(0.0305)	(0.0375)	(0.0303)
Leader	-0.2114***	0.1247*	0.0893	0.1322**	-0.2460***	0.1072***	0.0693***	0.0698***
	(0.0713)	(0.0676)	(0.0945)	(0.0610)	(0.0230)	(0.0217)	(0.0262)	(0.0203)
Other	0.0576	0.1365**	0.0169	0.1185**	0.0081	0.0758**	0.0624*	0.0607**
	(0.0664)	(0.0575)	(0.0847)	(0.0523)	(0.0364)	(0.0330)	(0.0337)	(0.0273)
Northeast	0.0041	-0.0189		-0.0163	0.0721***	0.0593***		0.0710***
	(0.0358)	(0.0312)		(0.0340)	(0.0178)	(0.0161)		(0.0190)
Central	-0.0324	-0.0376		-0.0273	0.0405**	0.0534***		0.0558***
	(0.0310)	(0.0276)		(0.0282)	(0.0162)	(0.0148)		(0.0171)
East	0.1191***	0.1135***		0.0994***	0.1451***	0.1485***		0.1276***
	(0.0316)	(0.0285)		(0.0287)	(0.0164)	(0.0153)		(0.0169)
Year 1991		-0.0089	0.1377	0.0284		0.1109***	0.1475***	0.1127***
		(0.1034)	(0.0937)	(0.0703)		(0.0113)	(0.0186)	(0.0121)
Year 1993		0.1791*	0.3374***	0.2013***		0.2371***	0.3008***	0.2371***
		(0.1006)	(0.1166)	(0.0690)		(0.0141)	(0.0311)	(0.0134)
Year 1997		0.7011***	0.9536***	0.7216***		0.6413***	0.8600***	0.6572***
		(0.1055)	(0.1916)	(0.0771)		(0.0404)	(0.0713)	(0.0322)
Year 2000		1.0068***	1.3603***	1.0271***		0.9748***	1.2377***	0.9910***
		(0.1064)	(0.2413)	(0.0789)		(0.0411)	(0.0904)	(0.0333)
Year 2004		1.1946***	1.7088***	1.2268***		1.2594***	1.6299***	1.2903***
		(0.1102)	(0.3070)	(0.0849)		(0.0435)	(0.1167)	(0.0362)
Year 2006		1.3525***	1.9401***	1.3892***		1.4318***	1.8206***	1.4544***
		(0.1116)	(0.3407)	(0.0877)		(0.0445)	(0.1297)	(0.0370)
Year 2009		1.6933***	2.3243***	1.7166***		1.7460***	2.2199***	1.7796***
		(0.1132)	(0.3923)	(0.0888)		(0.0450)	(0.1503)	(0.0376)
Constant	2.5186***	3.6669***	3.6924***	3.7442***	3.0054***	3.8433***	4.0452***	3.8311***
	(0.1233)	(0.1603)	(0.2570)	(0.1363)	(0.0737)	(0.0738)	(0.1869)	(0.0688)
Observations	3368	3368	3368	3368	14398	14398	14398	14398
r^2	0.5084	0.6019	0.5496		0.5695	0.6500	0.6032	

Table A9 Wage effects of overeducation (ORU) by groups -----The mode index

	Post-Mao education				Mao education			
Variables	**Pooled OLS (1)**	**Pooled OLS with time effects (2)**	**Fixed effects (3)**	**Random effects (4)**	**Pooled OLS (5)**	**Pooled OLS with time effects (6)**	**Fixed effects (7)**	**Random effects (8)**
Wage return to required education	0.3117***	0.1030***	0.0208	0.0977***	0.2405***	0.0694***	0.0632***	0.0739***
	(0.0154)	(0.0158)	(0.0443)	(0.0159)	(0.0091)	(0.0081)	(0.0202)	(0.0082)
Wage return to overeducation	0.1709***	0.0358**	0.0092	0.0431***	0.0975***	0.0487***	0.0550***	0.0549***
	(0.0164)	(0.0153)	(0.0404)	(0.0145)	(0.0095)	(0.0085)	(0.0200)	(0.0084)
Wage return to undereducation	-0.2124***	-0.1108***	0.0203	-0.1052***	-0.1304***	-0.0761***	-0.0371*	-0.0704***
	(0.0247)	(0.0217)	(0.0483)	(0.0196)	(0.0109)	(0.0095)	(0.0205)	(0.0088)
Female	-0.2182***	-0.1674***		-0.1806***	-0.1943***	-0.1779***		-0.1979***
	(0.0233)	(0.0206)		(0.0209)	(0.0117)	(0.0107)		(0.0121)
Urban registration	0.0445*	0.0500**		0.0333	0.0489***	0.0582***		0.0526***
	(0.0239)	(0.0215)		(0.0221)	(0.0115)	(0.0105)		(0.0120)
Experience	0.0664***	0.0403***	-0.0262	0.0384***	0.0416***	0.0283***	0.0296***	0.0315***
	(0.0075)	(0.0068)	(0.0215)	(0.0066)	(0.0023)	(0.0022)	(0.0091)	(0.0021)
Experience squared	-0.0010***	-0.0015***	-0.0005	-0.0014***	-0.0006***	-0.0004***	-0.0006***	-0.0005***
	(0.0003)	(0.0003)	(0.0005)	(0.0003)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Private sector	0.4719***	0.1547***	0.1041**	0.1261***	0.3909***	0.0064	-0.1343***	-0.0425**
	(0.0300)	(0.0305)	(0.0490)	(0.0276)	(0.0219)	(0.0217)	(0.0247)	(0.0187)
Collective sector	0.3134***	0.2068***	0.0710	0.1679***	0.3102***	0.1407***	-0.0442*	0.0776***
	(0.0336)	(0.0323)	(0.0460)	(0.0282)	(0.0233)	(0.0240)	(0.0228)	(0.0177)
Unknown ownership	0.3928***	0.1476**	0.0987	0.1234**	0.3218***	-0.0358	0.0077	-0.0421
	(0.0793)	(0.0719)	(0.0951)	(0.0593)	(0.0559)	(0.0521)	(0.0435)	(0.0345)
Firm size 2 (between 20 and 100 employees)	-0.0114	-0.0195	-0.0380	-0.0249	0.0575***	0.0268*	0.0024	0.0186
	(0.0274)	(0.0243)	(0.0394)	(0.0239)	(0.0179)	(0.0150)	(0.0178)	(0.0145)
Firm size 3 (less than 20 employees)	-0.1393***	-0.1509***	-0.1906***	-0.1563***	-0.1887***	-0.1597***	-0.0884***	-0.1393***
	(0.0323)	(0.0296)	(0.0488)	(0.0274)	(0.0236)	(0.0219)	(0.0232)	(0.0179)
Unknown firm size	-0.4150***	0.0351	-0.0225	0.0210	-0.8254***	-0.0432	0.0423	-0.0263
	(0.0354)	(0.0402)	(0.0649)	(0.0375)	(0.0157)	(0.0382)	(0.0392)	(0.0305)
Contractor	0.1640***	0.0615**	-0.0416	0.0410*	0.0825***	-0.0026	-0.0015	-0.0005
	(0.0270)	(0.0244)	(0.0363)	(0.0238)	(0.0234)	(0.0221)	(0.0218)	(0.0177)
Temporary	0.0740**	-0.0757***	-0.1079**	-0.0789***	0.0061	-0.1483***	-0.0904***	-0.1280***
	(0.0305)	(0.0279)	(0.0454)	(0.0272)	(0.0252)	(0.0233)	(0.0264)	(0.0201)
Other job type	0.0602	-0.0391	0.1285	-0.0155	-0.0798*	-0.0784**	-0.0373	-0.0607**
	(0.0921)	(0.0853)	(0.0856)	(0.0588)	(0.0449)	(0.0396)	(0.0360)	(0.0292)

Clerk	0.0514	0.1052***	0.0300	0.0951**	-0.0454***	0.0585***	0.0254	0.0354**
	(0.0438)	(0.0388)	(0.0586)	(0.0370)	(0.0169)	(0.0154)	(0.0203)	(0.0163)
Junior	0.0889***	0.1046***	0.0518	0.0936***	0.0299**	0.0891***	0.0252*	0.0568***
	(0.0274)	(0.0245)	(0.0345)	(0.0232)	(0.0135)	(0.0124)	(0.0139)	(0.0114)
Senior	0.2293***	0.2898***	0.0968	0.2416***	-0.1235***	0.1457***	0.0634**	0.1097***
	(0.0656)	(0.0570)	(0.1063)	(0.0611)	(0.0293)	(0.0242)	(0.0306)	(0.0240)
Leader	0.0503	0.1254**	0.1217	0.1216**	-0.0403*	0.0964***	0.0613***	0.0576***
	(0.0675)	(0.0618)	(0.0824)	(0.0557)	(0.0208)	(0.0192)	(0.0227)	(0.0172)
Other	0.1570**	0.1479***	0.0314	0.1250**	0.1049***	0.0779**	0.0676**	0.0644**
	(0.0685)	(0.0567)	(0.0838)	(0.0517)	(0.0364)	(0.0332)	(0.0337)	(0.0271)
Northeast	0.0076	-0.0176		-0.0140	0.0818***	0.0584***		0.0679***
	(0.0366)	(0.0312)		(0.0340)	(0.0178)	(0.0160)		(0.0189)
Central	-0.0337	-0.0349		-0.0231	0.0384**	0.0530***		0.0557***
	(0.0314)	(0.0274)		(0.0282)	(0.0162)	(0.0147)		(0.0170)
East	0.1160***	0.1172***		0.1056***	0.1430***	0.1533***		0.1321***
	(0.0319)	(0.0283)		(0.0285)	(0.0164)	(0.0152)		(0.0169)
Year 1991		0.0102	0.1842**	0.0441		0.1124***	0.1374***	0.1137***
		(0.1033)	(0.0916)	(0.0702)		(0.0111)	(0.0197)	(0.0118)
Year 1993		0.2026**	0.4201***	0.2220***		0.2344***	0.2725***	0.2327***
		(0.1005)	(0.1120)	(0.0687)		(0.0139)	(0.0347)	(0.0131)
Year 1997		0.7290***	1.1228***	0.7480***		0.6425***	0.8109***	0.6569***
		(0.1054)	(0.1809)	(0.0764)		(0.0400)	(0.0775)	(0.0320)
Year 2000		1.0463***	1.5959***	1.0637***		0.9757***	1.1716***	0.9907***
		(0.1060)	(0.2272)	(0.0774)		(0.0406)	(0.0995)	(0.0325)
Year 2004		1.2381***	2.0226***	1.2645***		1.2473***	1.5337***	1.2768***
		(0.1089)	(0.2922)	(0.0822)		(0.0426)	(0.1312)	(0.0348)
Year 2006		1.3881***	2.2862***	1.4220***		1.4154***	1.7009***	1.4342***
		(0.1100)	(0.3229)	(0.0841)		(0.0433)	(0.1464)	(0.0355)
Year 2009		1.7351***	2.7281***	1.7555***		1.7306***	2.0789***	1.7587***
		(0.1110)	(0.3730)	(0.0845)		(0.0437)	(0.1702)	(0.0358)
Constant	4.1105***	3.9061***	3.9969***	3.9465***	4.2742***	3.8946***	3.9244***	3.8718***
	(0.0659)	(0.1100)	(0.1348)	(0.0841)	(0.0419)	(0.0519)	(0.1862)	(0.0458)
Observations	3368	3368	3368	3368	14398	14398	14398	14398
r2	0.4897	0.6026	0.5489		0.5596	0.6512	0.6035	

Table A10 Wage returns to overeducation (ORU) by wave----the mean index

Variables	1989	1991	1993	1997	2000	2004	2006	2009
Wage return to required education	-0.0211	0.0022	-0.0914***	0.0034	0.1140***	0.0723***	0.0591***	0.0776***
	(0.0169)	(0.0116)	(0.0189)	(0.0230)	(0.0211)	(0.0210)	(0.0164)	(0.0154)
Wage return to overeducation	0.0061	0.0133**	0.0198**	0.0235***	0.0200**	0.0508***	0.0741***	0.0475***
	(0.0079)	(0.0055)	(0.0077)	(0.0081)	(0.0091)	(0.0093)	(0.0101)	(0.0102)
Wage return to undereducation	-0.0188*	-0.0113*	-0.0171*	-0.0057	-0.0223**	-0.0433***	-0.0439***	-0.0365***
	(0.0100)	(0.0067)	(0.0090)	(0.0097)	(0.0108)	(0.0093)	(0.0099)	(0.0099)
Female	-0.1291***	-0.1525***	-0.1304***	-0.1822***	-0.1799***	-0.1597***	-0.2009***	-0.2584***
	(0.0215)	(0.0148)	(0.0211)	(0.0226)	(0.0256)	(0.0244)	(0.0257)	(0.0258)
Urban registration	0.0082	0.0551***	0.1245***	0.0701***	0.0197	0.1086***	0.0786***	0.0944***
	(0.0213)	(0.0147)	(0.0208)	(0.0224)	(0.0260)	(0.0236)	(0.0249)	(0.0248)
Experience	0.0237***	0.0227***	0.0240***	0.0199***	0.0149***	0.0127***	0.0139***	0.0162***
	(0.0035)	(0.0025)	(0.0035)	(0.0039)	(0.0043)	(0.0044)	(0.0046)	(0.0044)
Experience squared	-0.0003***	-0.0002***	-0.0003***	-0.0003***	-0.0003***	-0.0002**	-0.0002**	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Private sector	0.0201	0.1426***	-0.0855	0.2717***	0.0649	0.0693**	0.0760**	0.0737**
	(0.0721)	(0.0545)	(0.0921)	(0.0602)	(0.0567)	(0.0329)	(0.0351)	(0.0332)
Collective sector	0.2957***	0.4659***	0.5869***	0.3982***	0.2247***	-0.1673***	-0.1795***	-0.0822*
	(0.0710)	(0.0435)	(0.0485)	(0.0401)	(0.0402)	(0.0385)	(0.0426)	(0.0458)
Unknown ownership	0.0747	-0.1136	0.2997**	0.2939***	0.2558***	-0.1037	0.0344	-0.0711
	(0.1090)	(0.1076)	(0.1399)	(0.1064)	(0.0987)	(0.0694)	(0.0675)	(0.0716)
Firm size 2 (between 20 and 100 employees)				-0.0057	-0.0912***	0.0435	-0.0057	0.0488*
				(0.0263)	(0.0297)	(0.0273)	(0.0292)	(0.0291)
Firm size 3 (less than 20 employees)				-0.1008***	-0.1305***	-0.1448***	-0.1480***	-0.1794***
				(0.0335)	(0.0371)	(0.0333)	(0.0334)	(0.0342)
Unknown firm size				0.0256	-0.0178	-0.0756	0.0096	-0.0498
				(0.0499)	(0.0523)	(0.0638)	(0.0678)	(0.0531)

Contractor	-0.0431	-0.5642**	0.0907	0.1056***	0.0841**	0.0296	-0.0414	-0.1105***
	(0.0843)	(0.2711)	(0.1484)	(0.0340)	(0.0386)	(0.0342)	(0.0351)	(0.0323)
Temporary	-0.5505	-0.0520		-0.0245	0.0192	-0.1612***	-0.1791***	-0.1793***
	(0.5453)	(0.0537)		(0.0426)	(0.0439)	(0.0374)	(0.0385)	(0.0374)
Other job type	-0.0643	-0.1669*	0.0161	-0.3474***	-0.0608	-0.1693*	-0.1684**	-0.0384
	(0.0643)	(0.0972)	(0.1047)	(0.0873)	(0.0691)	(0.0870)	(0.0822)	(0.0763)
Clerk	0.0617	0.0753**	0.1833***	0.1415**	-0.0942	0.1003	0.0446	0.0612
	(0.0426)	(0.0313)	(0.0471)	(0.0610)	(0.0662)	(0.0656)	(0.0633)	(0.0592)
Junior	0.0919***	0.0567***	0.1743***	0.1605***	0.0170	0.1251***	0.1403***	0.0983**
	(0.0301)	(0.0208)	(0.0330)	(0.0398)	(0.0459)	(0.0459)	(0.0440)	(0.0394)
Senior	0.2859***	0.1154*	0.4346***	0.2082**	-0.0291	0.2269***	0.2792***	0.2035***
	(0.0907)	(0.0642)	(0.0971)	(0.0966)	(0.0891)	(0.0804)	(0.0748)	(0.0748)
Leader	0.1463***	0.1218***	0.2949***	0.0819	-0.0547	0.0944	0.1438**	0.0875
	(0.0452)	(0.0313)	(0.0518)	(0.0567)	(0.0701)	(0.0673)	(0.0650)	(0.0640)
Other	0.1438**	0.0015	0.0750	0.1701**	0.0805	0.0636	0.0273	0.0304
	(0.0731)	(0.0582)	(0.0774)	(0.0679)	(0.0804)	(0.0653)	(0.0718)	(0.0644)
Northeast	0.0629*	0.0955***	-0.0028	-0.0932**	-0.0682*	0.1023***	0.1201***	0.1237***
	(0.0357)	(0.0249)	(0.0346)	(0.0416)	(0.0396)	(0.0355)	(0.0376)	(0.0375)
Central	0.0684**	0.0876***	-0.0248	0.1100***	0.0046	-0.0221	0.0400	0.1102***
	(0.0303)	(0.0208)	(0.0283)	(0.0305)	(0.0362)	(0.0347)	(0.0366)	(0.0358)
East	0.0939***	0.0941***	0.1817***	0.2164***	0.2102***	0.2212***	0.2238***	0.1803***
	(0.0307)	(0.0208)	(0.0287)	(0.0302)	(0.0355)	(0.0344)	(0.0367)	(0.0354)
Constant	4.2183***	4.0974***	5.0313***	4.6889***	4.2118***	4.7564***	5.0600***	5.2184***
	(0.1454)	(0.1027)	(0.1664)	(0.2076)	(0.1996)	(0.2084)	(0.1775)	(0.1730)
Observations	2797	2769	2363	2194	2014	1757	1843	2029
r2	0.0887	0.2214	0.1730	0.1502	0.1110	0.2684	0.2621	0.2666

Note: 1. There is no information regarding firm size from 1989 to 1993 in the raw data; 2. Only 18 observations in the raw data in 1993 have reported their job as temporary. They are dropped when merging data set.

Table A11 Wage returns to overeducation (ORU) by wave----the mode index

Variables	1989	1991	1993	1997	2000	2004	2006	2009
Wage return to required education	-0.0284	-0.0048	-0.0794***	0.0278	0.1604***	0.1381***	0.1263***	0.1483***
	(0.0362)	(0.0257)	(0.0219)	(0.0225)	(0.0247)	(0.0234)	(0.0189)	(0.0185)
Wage return to overeducation	0.0286	0.0268**	0.0343*	0.0442**	0.0550***	0.0871***	0.1018***	0.0416**
	(0.0188)	(0.0121)	(0.0199)	(0.0204)	(0.0202)	(0.0175)	(0.0207)	(0.0196)
Wage return to undereducation	-0.0354	-0.0386**	-0.0319*	-0.0543**	-0.0710***	-0.1004***	-0.1210***	-0.1448***
	(0.0222)	(0.0165)	(0.0189)	(0.0214)	(0.0259)	(0.0244)	(0.0182)	(0.0182)
Female	-0.1289***	-0.1517***	-0.1348***	-0.1815***	-0.1818***	-0.1657***	-0.2088***	-0.2645***
	(0.0215)	(0.0148)	(0.0211)	(0.0225)	(0.0254)	(0.0241)	(0.0256)	(0.0254)
Urban registration	0.0060	0.0535***	0.1264***	0.0685***	0.0158	0.1024***	0.0811***	0.0869***
	(0.0214)	(0.0147)	(0.0208)	(0.0223)	(0.0260)	(0.0240)	(0.0250)	(0.0247)
Experience	0.0239***	0.0227***	0.0237***	0.0194***	0.0157***	0.0138***	0.0140***	0.0155***
	(0.0034)	(0.0025)	(0.0035)	(0.0039)	(0.0043)	(0.0044)	(0.0045)	(0.0043)
Experience squared	-0.0003***	-0.0002***	-0.0003***	-0.0003***	-0.0003***	-0.0002**	-0.0002**	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Private sector	0.0124	0.1466***	-0.0854	0.2743***	0.0748	0.0797**	0.0844**	0.0912***
	(0.0727)	(0.0546)	(0.0924)	(0.0601)	(0.0566)	(0.0332)	(0.0352)	(0.0330)
Collective sector	0.2927***	0.4663***	0.5866***	0.3991***	0.2313***	-0.1596***	-0.1651***	-0.0650
	(0.0716)	(0.0436)	(0.0486)	(0.0400)	(0.0402)	(0.0387)	(0.0429)	(0.0454)
Unknown ownership	0.0733	-0.1154	0.2993**	0.2836***	0.2759***	-0.0999	0.0481	-0.0639
	(0.1092)	(0.1076)	(0.1401)	(0.1062)	(0.0986)	(0.0695)	(0.0678)	(0.0709)
Firm size 2 (between 20 and 100 employees)				-0.0036	-0.0904***	0.0373	-0.0111	0.0452
				(0.0263)	(0.0295)	(0.0272)	(0.0291)	(0.0288)
Firm size 3 (less than 20 employees)				-0.0977***	-0.1213***	-0.1514***	-0.1473***	-0.1742***
				(0.0335)	(0.0369)	(0.0333)	(0.0334)	(0.0338)

Unknown firm size				0.0311	-0.0125	-0.0730	0.0208	-0.0469
				(0.0499)	(0.0521)	(0.0638)	(0.0680)	(0.0526)
Contractor	-0.0565	-0.5682**	0.0914	0.1098***	0.0885**	0.0346	-0.0312	-0.1033***
	(0.0863)	(0.2710)	(0.1487)	(0.0340)	(0.0384)	(0.0342)	(0.0354)	(0.0321)
Temporary	-0.5560	-0.0490		-0.0181	0.0212	-0.1613***	-0.1717***	-0.1803***
	(0.5452)	(0.0537)		(0.0425)	(0.0437)	(0.0375)	(0.0387)	(0.0371)
Other job type	-0.0688	-0.1667*	0.0167	-0.3397***	-0.0506	-0.1798**	-0.1531*	-0.0328
	(0.0643)	(0.0970)	(0.1048)	(0.0872)	(0.0690)	(0.0870)	(0.0825)	(0.0756)
Clerk	0.0203	0.0597**	0.1211***	0.1228***	0.0364	0.1397***	0.0683	0.0679
	(0.0370)	(0.0262)	(0.0412)	(0.0416)	(0.0467)	(0.0455)	(0.0610)	(0.0609)
Junior	0.0781***	0.0581***	0.1111***	0.1516***	0.0982***	0.1445***	0.1347***	0.1031***
	(0.0276)	(0.0183)	(0.0272)	(0.0306)	(0.0351)	(0.0345)	(0.0366)	(0.0352)
Senior	0.3113***	0.1694**	0.2880***	0.1861***	0.0789	0.2257***	0.2868***	0.2084***
	(0.1186)	(0.0837)	(0.0776)	(0.0644)	(0.0690)	(0.0598)	(0.0562)	(0.0649)
Leader	0.1073***	0.1057***	0.2030***	0.0721*	0.0881*	0.1437***	0.1619**	0.0616
	(0.0410)	(0.0264)	(0.0423)	(0.0434)	(0.0501)	(0.0478)	(0.0665)	(0.0659)
Other	0.1127	-0.0196	-0.0118	0.1584**	0.1117	0.0379	0.0452	0.0819
	(0.0756)	(0.0602)	(0.0787)	(0.0672)	(0.0796)	(0.0666)	(0.0698)	(0.0632)
Northeast	0.0613*	0.0954***	0.0007	-0.1005**	-0.0724*	0.1060***	0.1299***	0.1263***
	(0.0356)	(0.0249)	(0.0346)	(0.0416)	(0.0395)	(0.0355)	(0.0376)	(0.0371)
Central	0.0657**	0.0856***	-0.0275	0.1066***	0.0013	-0.0180	0.0423	0.1220***
	(0.0304)	(0.0208)	(0.0283)	(0.0305)	(0.0361)	(0.0348)	(0.0367)	(0.0355)
East	0.0953***	0.0936***	0.1826***	0.2210***	0.2115***	0.2290***	0.2316***	0.1882***
	(0.0307)	(0.0208)	(0.0288)	(0.0302)	(0.0354)	(0.0344)	(0.0368)	(0.0350)
Constant	4.0984***	4.1309***	4.4190***	4.6714***	4.8807***	5.1190***	5.3313***	5.6492***
	(0.0852)	(0.0597)	(0.0611)	(0.0709)	(0.0822)	(0.0864)	(0.0889)	(0.0880)
Observations	2797	2769	2363	2194	2014	1757	1843	2029
r^2	0.0889	0.2221	0.1703	0.1521	0.1156	0.2674	0.2587	0.2796

Table A12 Wage returns to years of schooling by wave using monthly wage

Variables	1989	1991	1993	1997	2000	2004	2006	2009
Wage return to years of schooling	0.0097*	0.0119***	0.0074	0.0169***	0.0342***	0.0455***	0.0570***	0.0482***
	(0.0053)	(0.0036)	(0.0050)	(0.0054)	(0.0060)	(0.0056)	(0.0058)	(0.0058)
Female	-0.1318***	-0.1528***	-0.1482***	-0.1833***	-0.1564***	-0.1500***	-0.1965***	-0.2401***
	(0.0214)	(0.0148)	(0.0210)	(0.0222)	(0.0251)	(0.0236)	(0.0250)	(0.0249)
Urban registration	0.0087	0.0544***	0.1321***	0.0707***	0.0080	0.0969***	0.0729***	0.0794***
	(0.0213)	(0.0147)	(0.0209)	(0.0223)	(0.0260)	(0.0237)	(0.0249)	(0.0248)
Experience	0.0242***	0.0230***	0.0238***	0.0195***	0.0146***	0.0126***	0.0128***	0.0152***
	(0.0035)	(0.0025)	(0.0035)	(0.0039)	(0.0043)	(0.0043)	(0.0044)	(0.0043)
Experience squared	-0.0003***	-0.0002***	-0.0003***	-0.0003***	-0.0002**	-0.0002**	-0.0002*	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Private sector	0.0275	0.1469***	-0.1099	0.2739***	0.0577	0.0634*	0.0806**	0.0720**
	(0.0721)	(0.0546)	(0.0925)	(0.0601)	(0.0567)	(0.0325)	(0.0341)	(0.0325)
Collective sector	0.3089***	0.4694***	0.6013***	0.4024***	0.2159***	-0.1726***	-0.1744***	-0.0878*
	(0.0708)	(0.0435)	(0.0487)	(0.0398)	(0.0401)	(0.0384)	(0.0421)	(0.0455)
Unknown ownership	0.0850	-0.1135	0.3099**	0.2885***	0.2532**	-0.1019	0.0284	-0.0726
	(0.1088)	(0.1075)	(0.1408)	(0.1063)	(0.0988)	(0.0695)	(0.0670)	(0.0713)
Firm size 2 (between 20 and 100 employees)				-0.0071	-0.0727**	0.0472*	-0.0059	0.0542*
				(0.0260)	(0.0294)	(0.0270)	(0.0288)	(0.0289)
Firm size 3 (less than 20 employees)				-0.1028***	-0.1119***	-0.1474***	-0.1448***	-0.1673***
				(0.0333)	(0.0370)	(0.0331)	(0.0330)	(0.0340)
Unknown firm size				0.0274	-0.0022	-0.0661	0.0127	-0.0443
				(0.0498)	(0.0522)	(0.0638)	(0.0676)	(0.0529)
Contractor	-0.0211	-0.5591**	0.0877	0.1082***	0.0854**	0.0247	-0.0387	-0.1163***
	(0.0837)	(0.2710)	(0.1494)	(0.0339)	(0.0386)	(0.0341)	(0.0350)	(0.0322)
Temporary	-0.5650	-0.0505		-0.0187	0.0192	-0.1654***	-0.1702***	-0.1819***
	(0.5452)	(0.0537)		(0.0426)	(0.0439)	(0.0374)	(0.0384)	(0.0372)

Other job type	-0.0633	-0.1657*	0.0195	-0.3435***	-0.0637	-0.1720**	-0.1636**	-0.0411
	(0.0642)	(0.0969)	(0.1052)	(0.0872)	(0.0691)	(0.0868)	(0.0818)	(0.0760)
Clerk	0.0222	0.0595**	0.0186	0.1142***	0.1079**	0.1765***	0.0908**	0.1746***
	(0.0370)	(0.0262)	(0.0363)	(0.0381)	(0.0434)	(0.0419)	(0.0435)	(0.0436)
Junior	0.0629**	0.0505***	0.0590**	0.1437***	0.1544***	0.1753***	0.1425***	0.1451***
	(0.0255)	(0.0174)	(0.0252)	(0.0279)	(0.0325)	(0.0318)	(0.0335)	(0.0327)
Senior	0.1487***	0.0721*	-0.0130	0.1705***	0.2645***	0.3218***	0.3049***	0.3396***
	(0.0535)	(0.0381)	(0.0503)	(0.0512)	(0.0551)	(0.0467)	(0.0508)	(0.0508)
Leader	0.1075***	0.1051***	0.1060***	0.0579	0.1589***	0.1704***	0.1812***	0.1671***
	(0.0410)	(0.0263)	(0.0380)	(0.0389)	(0.0466)	(0.0444)	(0.0493)	(0.0494)
Other	0.1464**	0.0043	0.0610	0.1601**	0.1152	0.0840	0.0410	0.0625
	(0.0728)	(0.0579)	(0.0775)	(0.0673)	(0.0798)	(0.0623)	(0.0683)	(0.0635)
Northeast	0.0596*	0.0940***	0.0013	-0.0962**	-0.0703*	0.1039***	0.1180***	0.1256***
	(0.0356)	(0.0249)	(0.0349)	(0.0416)	(0.0396)	(0.0355)	(0.0375)	(0.0373)
Central	0.0681**	0.0871***	-0.0230	0.1093***	0.0000	-0.0192	0.0350	0.1129***
	(0.0303)	(0.0208)	(0.0284)	(0.0305)	(0.0362)	(0.0346)	(0.0365)	(0.0357)
East	0.0969***	0.0943***	0.1898***	0.2179***	0.1996***	0.2213***	0.2203***	0.1763***
	(0.0306)	(0.0207)	(0.0288)	(0.0302)	(0.0354)	(0.0344)	(0.0365)	(0.0352)
Constant	3.9539***	4.0112***	4.1996***	4.5787***	4.8914***	4.9993***	5.0805***	5.4907***
	(0.0682)	(0.0469)	(0.0648)	(0.0760)	(0.0892)	(0.0908)	(0.0971)	(0.0995)
Observations	2797	2769	2363	2194	2014	1757	1843	2029
r^2	0.0877	0.2218	0.1615	0.1504	0.1083	0.2666	0.2642	0.2698

Table A13 Wage returns to years of schooling by wave using hourly wage

Variables	1989	1991	1993	1997	2000	2004	2006	2009
Wage return to years of schooling	0.0147***	0.0147***	0.0126**	0.0243***	0.0410***	0.0542***	0.0612***	0.0583***
	(0.0055)	(0.0037)	(0.0051)	(0.0058)	(0.0067)	(0.0064)	(0.0063)	(0.0064)
Female	-0.1233***	-0.1365***	-0.1314***	-0.1628***	-0.1136***	-0.1182***	-0.1679***	-0.2263***
	(0.0221)	(0.0155)	(0.0214)	(0.0239)	(0.0277)	(0.0268)	(0.0267)	(0.0273)
Urban registration	0.0393*	0.0610***	0.1546***	0.1180***	0.0407	0.0789***	0.1146***	0.0849***
	(0.0220)	(0.0154)	(0.0213)	(0.0239)	(0.0287)	(0.0270)	(0.0267)	(0.0273)
Experience	0.0257***	0.0234***	0.0253***	0.0222***	0.0179***	0.0196***	0.0169***	0.0187***
	(0.0036)	(0.0026)	(0.0037)	(0.0042)	(0.0047)	(0.0049)	(0.0048)	(0.0047)
Experience squared	-0.0003***	-0.0002***	-0.0003***	-0.0003***	-0.0003**	-0.0003**	-0.0003***	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Private sector	0.0286	0.1696***	-0.0486	0.2894***	0.0031	-0.0617*	-0.0712*	-0.0852**
	(0.0742)	(0.0576)	(0.0934)	(0.0651)	(0.0628)	(0.0370)	(0.0366)	(0.0357)
Collective sector	0.3691***	0.3938***	0.5173***	0.2386***	0.0934**	-0.2358***	-0.1909***	-0.2445***
	(0.0740)	(0.0457)	(0.0508)	(0.0430)	(0.0444)	(0.0436)	(0.0451)	(0.0500)
Unknown ownership	0.0594	-0.1341	0.1676	0.2152*	0.1405	-0.1528*	-0.0310	-0.1509*
	(0.1179)	(0.1174)	(0.1635)	(0.1214)	(0.1111)	(0.0796)	(0.0723)	(0.0787)
Firm size 2 (between 20 and 100 employees)				-0.0036	-0.0919***	0.0373	0.0030	0.0613*
				(0.0279)	(0.0324)	(0.0306)	(0.0308)	(0.0318)
Firm size 3 (less than 20 employees)				-0.0711**	-0.1152***	-0.1453***	-0.1378***	-0.1377***
				(0.0358)	(0.0408)	(0.0377)	(0.0353)	(0.0373)
Unknown firm size				0.0319	-0.0054	-0.0669	-0.0420	-0.0746
				(0.0542)	(0.0580)	(0.0741)	(0.0740)	(0.0586)
Contractor	0.4096***	-0.6485**	-0.0293	0.0665*	0.0456	0.0481	-0.0524	-0.0946***
	(0.0866)	(0.2834)	(0.1509)	(0.0365)	(0.0427)	(0.0387)	(0.0375)	(0.0355)
Temporary	-0.6059	0.0498		-0.0688	-0.0004	-0.2178***	-0.1968***	-0.2154***
	(0.5607)	(0.0562)		(0.0463)	(0.0486)	(0.0425)	(0.0412)	(0.0410)
Other job type	-0.1175*	-0.1960*	-0.0293	-0.2587***	-0.0428	-0.1704*	-0.1765**	-0.0910
	(0.0666)	(0.1017)	(0.1085)	(0.0942)	(0.0772)	(0.0998)	(0.0886)	(0.0840)
Clerk	0.0421	0.0571**	0.0081	0.1532***	0.1636***	0.2757***	0.1666***	0.2299***
	(0.0382)	(0.0274)	(0.0369)	(0.0408)	(0.0478)	(0.0476)	(0.0465)	(0.0480)
Junior	0.0816***	0.0610***	0.0664***	0.1588***	0.1929***	0.2035***	0.1371***	0.1926***
	(0.0263)	(0.0183)	(0.0257)	(0.0299)	(0.0359)	(0.0362)	(0.0360)	(0.0359)
Senior	0.1489***	0.0709*	-0.0214	0.1991***	0.3083***	0.3739***	0.3725***	0.3978***
	(0.0552)	(0.0399)	(0.0509)	(0.0550)	(0.0605)	(0.0530)	(0.0546)	(0.0559)
Leader	0.1263***	0.0944***	0.1153***	0.0743*	0.2022***	0.2777***	0.2669***	0.2022***
	(0.0425)	(0.0275)	(0.0385)	(0.0418)	(0.0514)	(0.0506)	(0.0528)	(0.0544)

Other	0.2002***	0.0174	0.1227	0.1959***	0.0595	0.2538***	0.2138***	0.1529**
	(0.0755)	(0.0606)	(0.0792)	(0.0738)	(0.0905)	(0.0714)	(0.0733)	(0.0696)
Northeast	0.0582	0.0860***	-0.0492	-0.1509***	-0.0900**	0.0362	0.0590	0.0197
	(0.0368)	(0.0260)	(0.0355)	(0.0445)	(0.0440)	(0.0403)	(0.0402)	(0.0409)
Central	0.0890***	0.0939***	-0.0126	0.0849***	0.0349	-0.0437	0.0134	0.0880**
	(0.0314)	(0.0218)	(0.0291)	(0.0328)	(0.0402)	(0.0395)	(0.0393)	(0.0392)
East	0.0822***	0.0665***	0.1585***	0.1118***	0.1433***	0.1647***	0.1510***	0.1162***
	(0.0317)	(0.0217)	(0.0295)	(0.0325)	(0.0391)	(0.0391)	(0.0391)	(0.0387)
Constant	-1.4063***	-1.2881***	-1.1328***	-0.6469***	-0.3789***	-0.3228***	-0.1459	0.2093*
	(0.0705)	(0.0491)	(0.0667)	(0.0818)	(0.0986)	(0.1035)	(0.1040)	(0.1097)
Observations	2770	2750	2304	2146	1955	1737	1827	2012
r^2	0.1251	0.2054	0.1504	0.1309	0.1152	0.2940	0.3175	0.3172

Table A14 Wage returns to overeducation (ORU) using hourly wage

	The mean index				The mode index			
Variables	**Pooled OLS (1)**	**Pooled OLS with time effects (2)**	**Fixed effects (3)**	**Random effects (4)**	**Pooled OLS (5)**	**Pooled OLS with time effects (6)**	**Fixed effects (7)**	**Random effects (8)**
Wage return to required education	0.2525***	0.0539***	0.0248**	0.0505***	0.2908***	0.1099***	0.0628***	0.1104***
	(0.0064)	(0.0064)	(0.0106)	(0.0064)	(0.0083)	(0.0075)	(0.0199)	(0.0076)
Wage return to overeducation	0.0341***	0.0300***	0.0222***	0.0324***	0.1083***	0.0510***	0.0441**	0.0607***
	(0.0041)	(0.0035)	(0.0073)	(0.0036)	(0.0085)	(0.0076)	(0.0195)	(0.0077)
Wage return to undereducation	-0.0433***	-0.0265***	-0.0130	-0.0293***	-0.1402***	-0.0901***	-0.0287	-0.0875***
	(0.0046)	(0.0042)	(0.0089)	(0.0042)	(0.0102)	(0.0089)	(0.0204)	(0.0085)
Female	-0.1941***	-0.1519***		-0.1674***	-0.1775***	-0.1543***		-0.1705***
	(0.0110)	(0.0100)		(0.0113)	(0.0110)	(0.0099)		(0.0112)
Urban registration	0.0775***	0.0788***		0.0685***	0.0672***	0.0759***		0.0650***
	(0.0109)	(0.0099)		(0.0113)	(0.0109)	(0.0099)		(0.0113)
Experience	0.0261***	0.0199***	0.0192**	0.0217***	0.0281***	0.0201***	0.0187**	0.0221***
	(0.0019)	(0.0017)	(0.0080)	(0.0016)	(0.0019)	(0.0017)	(0.0089)	(0.0016)
Experience squared	-0.0003***	-0.0003***	-0.0006***	-0.0003***	-0.0004***	-0.0003***	-0.0006***	-0.0003***
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Private sector	0.2938***	-0.0668***	-0.1618***	-0.0933***	0.3656***	-0.0489**	-0.1550***	-0.0760***
	(0.0185)	(0.0192)	(0.0239)	(0.0164)	(0.0191)	(0.0193)	(0.0239)	(0.0165)
Collective sector	0.2503***	0.0886***	-0.0471**	0.0571***	0.2732***	0.0982***	-0.0469**	0.0653***
	(0.0209)	(0.0212)	(0.0223)	(0.0162)	(0.0211)	(0.0212)	(0.0223)	(0.0162)
Unknown ownership	0.2990***	-0.0443	-0.0186	-0.0466	0.3634***	-0.0347	-0.0184	-0.0394
	(0.0505)	(0.0460)	(0.0443)	(0.0331)	(0.0510)	(0.0459)	(0.0442)	(0.0330)
Firm size 2 (between 20 and 100 employees)	0.0124	0.0118	-0.0145	0.0013	0.0282*	0.0071	-0.0170	-0.0034
	(0.0158)	(0.0140)	(0.0177)	(0.0135)	(0.0162)	(0.0139)	(0.0177)	(0.0134)
Firm size 3 (less than 20 employees)	-0.2195***	-0.1611***	-0.1068***	-0.1492***	-0.2007***	-0.1610***	-0.1114***	-0.1513***
	(0.0202)	(0.0193)	(0.0229)	(0.0163)	(0.0205)	(0.0191)	(0.0230)	(0.0162)
Unknown firm size	-0.8535***	-0.0242	0.0408	-0.0139	-0.9594***	-0.0227	0.0422	-0.0130
	(0.0156)	(0.0317)	(0.0368)	(0.0259)	(0.0149)	(0.0315)	(0.0367)	(0.0258)
Contractor	0.1360***	0.0370*	-0.0458**	0.0207	0.1522***	0.0429**	-0.0436**	0.0257*
	(0.0202)	(0.0192)	(0.0203)	(0.0153)	(0.0205)	(0.0191)	(0.0203)	(0.0153)
Temporary	-0.0213	-0.1766***	-0.1464***	-0.1680***	0.0043	-0.1688***	-0.1428***	-0.1603***
	(0.0213)	(0.0197)	(0.0250)	(0.0174)	(0.0219)	(0.0197)	(0.0251)	(0.0174)
Other job type	-0.0487	-0.0804**	-0.0425	-0.0719**	-0.0287	-0.0749*	-0.0421	-0.0686**
	(0.0432)	(0.0388)	(0.0364)	(0.0286)	(0.0442)	(0.0386)	(0.0364)	(0.0285)

Clerk	-0.2872***	0.0669***	0.0183	0.0485**	-0.0160	0.0860***	0.0165	0.0607***
	(0.0197)	(0.0188)	(0.0249)	(0.0194)	(0.0170)	(0.0154)	(0.0207)	(0.0160)
Junior	-0.1440***	0.0829***	0.0152	0.0550***	0.0373***	0.0961***	0.0172	0.0652***
	(0.0142)	(0.0136)	(0.0164)	(0.0130)	(0.0127)	(0.0115)	(0.0141)	(0.0110)
Senior	-0.5347***	0.1380***	0.0618	0.1154***	-0.1325***	0.1400***	0.0509	0.1141***
	(0.0333)	(0.0299)	(0.0388)	(0.0299)	(0.0290)	(0.0238)	(0.0317)	(0.0238)
Leader	-0.2761***	0.1051***	0.0585**	0.0769***	-0.0200	0.1222***	0.0545**	0.0872***
	(0.0217)	(0.0207)	(0.0273)	(0.0206)	(0.0196)	(0.0180)	(0.0236)	(0.0176)
Other	0.0800**	0.1477***	0.0809**	0.1159***	0.2004***	0.1666***	0.0906***	0.1327***
	(0.0336)	(0.0303)	(0.0343)	(0.0263)	(0.0342)	(0.0304)	(0.0343)	(0.0261)
Northeast	0.0092	0.0005		0.0019	0.0197	0.0002		0.0005
	(0.0168)	(0.0149)		(0.0178)	(0.0169)	(0.0148)		(0.0177)
Central	0.0319**	0.0447***		0.0466***	0.0288*	0.0442***		0.0466***
	(0.0151)	(0.0138)		(0.0157)	(0.0153)	(0.0137)		(0.0157)
East	0.0885***	0.0923***		0.0745***	0.0832***	0.0954***		0.0777***
	(0.0148)	(0.0137)		(0.0156)	(0.0150)	(0.0137)		(0.0156)
Year 1991		0.0847***	0.1452***	0.0946***		0.0978***	0.1514***	0.1057***
		(0.0124)	(0.0194)	(0.0128)		(0.0122)	(0.0201)	(0.0125)
Year 1993		0.2210***	0.3125***	0.2331***		0.2249***	0.3126***	0.2350***
		(0.0147)	(0.0319)	(0.0139)		(0.0145)	(0.0347)	(0.0135)
Year 1997		0.8023***	0.9994***	0.8143***		0.8108***	1.0082***	0.8214***
		(0.0341)	(0.0708)	(0.0281)		(0.0337)	(0.0758)	(0.0278)
Year 2000		1.1341***	1.3889***	1.1509***		1.1538***	1.4045***	1.1679***
		(0.0357)	(0.0905)	(0.0289)		(0.0350)	(0.0978)	(0.0281)
Year 2004		1.3821***	1.7528***	1.4116***		1.3993***	1.7669***	1.4233***
		(0.0373)	(0.1172)	(0.0318)		(0.0360)	(0.1292)	(0.0302)
Year 2006		1.5339***	1.9381***	1.5605***		1.5388***	1.9405***	1.5602***
		(0.0386)	(0.1306)	(0.0328)		(0.0370)	(0.1441)	(0.0310)
Year 2009		1.8509***	2.3340***	1.8852***		1.8617***	2.3372***	1.8890***
		(0.0389)	(0.1515)	(0.0329)		(0.0371)	(0.1678)	(0.0308)
Constant	-2.3638***	-1.6029***	-1.2913***	-1.5596***	-0.7504***	-1.3640***	-1.2041***	-1.3525***
	(0.0662)	(0.0660)	(0.1648)	(0.0626)	(0.0345)	(0.0433)	(0.1530)	(0.0383)
Observations	17501	17501	17501	17501	17501	17501	17501	17501
r^2	0.5732	0.6536	0.5913		0.5590	0.6552	0.5915	

Table A15 Wage effects of overeducation (VV)

	The mean index				The mode index			
Variables	**Pooled OLS (1)**	**Pooled OLS with time effects (2)**	**Fixed effects (3)**	**Random effects (4)**	**Pooled OLS (5)**	**Pooled OLS with time effects (6)**	**Fixed effects (7)**	**Random effects (8)**
Wage return to education	0.1141***	0.0300***	0.2767***	0.0286***	0.2393***	0.0831***	0.0509***	0.0826***
	(0.0040)	(0.0035)	(0.0590)	(0.0035)	(0.0076)	(0.0068)	(0.0176)	(0.0066)
Overeducated	-0.2400***	0.0004	0.0399**	0.0126	-0.2033***	-0.0513***	-0.0064	-0.0445***
	(0.0177)	(0.0156)	(0.0190)	(0.0147)	(0.0140)	(0.0122)	(0.0158)	(0.0118)
Undereducated	0.2257***	0.0483***	0.0199	0.0388**	0.1486***	0.0285**	0.0427***	0.0331***
	(0.0185)	(0.0166)	(0.0235)	(0.0154)	(0.0138)	(0.0124)	(0.0158)	(0.0114)
Female	-0.1754***	-0.1686***		-0.1859***	-0.1929***	-0.1751***		-0.1925***
	(0.0106)	(0.0095)		(0.0105)	(0.0105)	(0.0095)		(0.0105)
Urban registration	0.0379***	0.0550***		0.0454***	0.0441***	0.0568***		0.0473***
	(0.0105)	(0.0094)		(0.0106)	(0.0105)	(0.0094)		(0.0105)
Experience	0.0248***	0.0176***	0.2823***	0.0194***	0.0248***	0.0174***	0.0162**	0.0190***
	(0.0018)	(0.0016)	(0.0588)	(0.0015)	(0.0018)	(0.0016)	(0.0082)	(0.0015)
Experience squared	-0.0003***	-0.0003***	-0.0006***	-0.0003***	-0.0003***	-0.0003***	-0.0005***	-0.0003***
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Private sector	0.4435***	0.0495***	-0.0960***	0.0035	0.4718***	0.0607***	-0.0931***	0.0138
	(0.0180)	(0.0176)	(0.0218)	(0.0151)	(0.0178)	(0.0178)	(0.0219)	(0.0152)
Collective sector	0.3229***	0.1608***	-0.0165	0.1052***	0.3368***	0.1671***	-0.0186	0.1106***
	(0.0192)	(0.0191)	(0.0203)	(0.0149)	(0.0193)	(0.0192)	(0.0203)	(0.0149)
Unknown ownership	0.4017***	0.0074	0.0273	-0.0036	0.4099***	0.0126	0.0238	0.0000
	(0.0476)	(0.0433)	(0.0394)	(0.0299)	(0.0476)	(0.0433)	(0.0394)	(0.0299)
Firm size 2 (between 20 and 100 employees)	0.0592***	0.0186	-0.0015	0.0111	0.0411***	0.0112	-0.0033	0.0051
	(0.0153)	(0.0127)	(0.0162)	(0.0124)	(0.0153)	(0.0128)	(0.0162)	(0.0124)
Firm size 3 (less than 20 employees)	-0.1740***	-0.1586***	-0.1026***	-0.1424***	-0.1836***	-0.1622***	-0.1037***	-0.1468***
	(0.0193)	(0.0178)	(0.0209)	(0.0150)	(0.0192)	(0.0177)	(0.0209)	(0.0150)
Unknown firm size	-0.8513***	0.0082	0.0389	0.0123	-0.8565***	0.0060	0.0394	0.0097
	(0.0139)	(0.0279)	(0.0333)	(0.0236)	(0.0140)	(0.0277)	(0.0334)	(0.0236)
Contractor	0.1241***	0.0270	-0.0172	0.0201	0.1401***	0.0323**	-0.0149	0.0241*
	(0.0183)	(0.0165)	(0.0185)	(0.0141)	(0.0183)	(0.0165)	(0.0186)	(0.0141)
Temporary	0.0247	-0.1237***	-0.0975***	-0.1126***	0.0374*	-0.1184***	-0.0947***	-0.1078***
	(0.0202)	(0.0178)	(0.0227)	(0.0160)	(0.0203)	(0.0178)	(0.0227)	(0.0160)
Other job type	-0.0368	-0.0783**	-0.0194	-0.0577**	-0.0340	-0.0770**	-0.0165	-0.0567**
	(0.0419)	(0.0365)	(0.0330)	(0.0262)	(0.0421)	(0.0363)	(0.0330)	(0.0262)
Clerk	0.0077	0.0781***	0.0469**	0.0615***	-0.0026	0.0592***	0.0284	0.0416***
	(0.0173)	(0.0149)	(0.0189)	(0.0146)	(0.0164)	(0.0143)	(0.0188)	(0.0145)
Junior	0.0501***	0.0996***	0.0370***	0.0723***	0.0494***	0.0879***	0.0286**	0.0617***
	(0.0123)	(0.0111)	(0.0129)	(0.0102)	(0.0121)	(0.0109)	(0.0128)	(0.0101)

Senior	0.0248	0.1952***	0.1026***	0.1619***	-0.0446*	0.1443***	0.0765***	0.1186***
	(0.0245)	(0.0205)	(0.0279)	(0.0207)	(0.0260)	(0.0212)	(0.0281)	(0.0210)
Leader	-0.0176	0.1107***	0.0911***	0.0827***	-0.0140	0.0934***	0.0702***	0.0637***
	(0.0209)	(0.0189)	(0.0217)	(0.0161)	(0.0202)	(0.0185)	(0.0215)	(0.0159)
Other	0.0912***	0.0842***	0.0610*	0.0712***	0.1114***	0.0825***	0.0634**	0.0694***
	(0.0332)	(0.0288)	(0.0313)	(0.0241)	(0.0327)	(0.0288)	(0.0313)	(0.0241)
Northeast	0.0568***	0.0379***		0.0406**	0.0616***	0.0380***		0.0402**
	(0.0164)	(0.0144)		(0.0166)	(0.0163)	(0.0143)		(0.0166)
Central	0.0233	0.0346***		0.0325**	0.0242*	0.0344***		0.0330**
	(0.0147)	(0.0131)		(0.0147)	(0.0147)	(0.0131)		(0.0146)
East	0.1214***	0.1355***		0.1132***	0.1312***	0.1405***		0.1185***
	(0.0148)	(0.0135)		(0.0146)	(0.0147)	(0.0135)		(0.0146)
Year 1991		0.1089***	-0.3552***	0.1138***		0.1112***	0.1526***	0.1160***
		(0.0113)	(0.1131)	(0.0116)		(0.0112)	(0.0185)	(0.0116)
Year 1993		0.2469***	-0.7273***	0.2503***		0.2429***	0.3069***	0.2466***
		(0.0136)	(0.2305)	(0.0125)		(0.0136)	(0.0318)	(0.0124)
Year 1997		0.7328***	-1.2205***	0.7405***		0.7271***	0.8844***	0.7362***
		(0.0304)	(0.4681)	(0.0254)		(0.0302)	(0.0692)	(0.0254)
Year 2000		1.0754***	-1.6294**	1.0839***		1.0707***	1.2668***	1.0809***
		(0.0307)	(0.6431)	(0.0257)		(0.0306)	(0.0894)	(0.0257)
Year 2004		1.3255***	-2.3024***	1.3532***		1.3177***	1.6427***	1.3464***
		(0.0324)	(0.8765)	(0.0279)		(0.0321)	(0.1184)	(0.0277)
Year 2006		1.4927***	-2.6264***	1.5186***		1.4735***	1.8329***	1.5009***
		(0.0329)	(0.9922)	(0.0283)		(0.0328)	(0.1318)	(0.0282)
Year 2009		1.8121***	-3.0427***	1.8420***		1.7932***	2.2136***	1.8241***
		(0.0330)	(1.1691)	(0.0282)		(0.0330)	(0.1535)	(0.0281)
Constant	4.0015***	3.8345***	-1.8359	3.8762***	4.5463***	3.9540***	4.0989***	3.9815***
	(0.0482)	(0.0486)	(1.3141)	(0.0449)	(0.0328)	(0.0394)	(0.1396)	(0.0353)
Observations	17766	17766	17766	17766	17766	17766	17766	17766
r^2	0.5390	0.6518	0.5972		0.5417	0.6526	0.5966	

Appendix B

Table B 1 Highest educational level

Highest educational level	Freq.	Percent
Primary school or less	331	14.65
Junior high school	669	29.60
Senior high school	710	31.42
College level	304	13.45
University	228	10.09
Master’s or higher	18	0.80
Total	2260	10.00

Table B 2 Marginal effects of reporting each answer category of overall job satisfaction (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.045***	0.052***	-0.097***	0.045***	0.051***	-0.096***
							(0.0144)	(0.0165)	(0.0307)	(0.0144)	(0.0166)	(0.0307)
Actual years of schooling	-0.007***	-0.009***	0.016***	-0.009***	-0.010***	0.019***	-0.008***	-0.009***	0.017***	-0.009***	-0.011***	0.020***
	(0.0021)	(0.0024)	(0.0045)	(0.0021)	(0.0024)	(0.0044)	(0.0021)	(0.0024)	(0.0045)	(0.0021)	(0.0024)	(0.0044)
Overeducated	0.009	0.010	-0.018	0.009	0.010	-0.018	0.008	0.009	-0.017	0.008	0.009	-0.017
	(0.0126)	(0.0145)	(0.0270)	(0.0126)	(0.0145)	(0.0270)	(0.0125)	(0.0144)	(0.0270)	(0.0125)	(0.0145)	(0.0270)
Undereducated	-0.005	-0.006	0.010	-0.006	-0.007	0.013	-0.005	-0.006	0.011	-0.006	-0.007	0.014
	(0.0106)	(0.0122)	(0.0228)	(0.0106)	(0.0122)	(0.0229)	(0.0106)	(0.0122)	(0.0228)	(0.0106)	(0.0122)	(0.0228)
Age	0.007**	0.008**	-0.015**	0.007**	0.008**	-0.014**	0.007**	0.008**	-0.016**	0.007**	0.008**	-0.014**
	(0.0032)	(0.0037)	(0.0069)	(0.0032)	(0.0037)	(0.0069)	(0.0032)	(0.0037)	(0.0069)	(0.0032)	(0.0037)	(0.0069)
$Age^2/100$	-0.010**	-0.011**	0.021**	-0.009**	-0.010**	0.019**	-0.010**	-0.011**	0.021**	-0.009**	-0.011**	0.020**
	(0.0039)	(0.0045)	(0.0084)	(0.0039)	(0.0045)	(0.0084)	(0.0039)	(0.0045)	(0.0084)	(0.0039)	(0.0045)	(0.0084)
Hourly wage	-0.001***	-0.001***	0.002***				-0.001***	-0.001***	0.002***			
	(0.0004)	(0.0004)	(0.0008)				(0.0004)	(0.0004)	(0.0008)			
Male	0.012	0.014	-0.027	0.010	0.011	-0.021	0.012	0.014	-0.026	0.009	0.011	-0.020
	(0.0089)	(0.0102)	(0.0191)	(0.0089)	(0.0102)	(0.0190)	(0.0089)	(0.0102)	(0.0191)	(0.0088)	(0.0102)	(0.0190)
Ethnicity	0.032*	0.037*	-0.069*	0.032*	0.037*	-0.069*	0.028*	0.033*	-0.061*	0.029*	0.033*	-0.061*
	(0.0173)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0371)	(0.0173)	(0.0199)	(0.0371)
Political	-0.011	-0.013	0.025	-0.013	-0.015	0.028	-0.012	-0.013	0.025	-0.013	-0.015	0.028
	(0.0134)	(0.0154)	(0.0288)	(0.0134)	(0.0154)	(0.0288)	(0.0134)	(0.0154)	(0.0287)	(0.0134)	(0.0154)	(0.0287)
Married	-0.026**	-0.030**	0.056**	-0.025*	-0.029*	0.054*	-0.026**	-0.030**	0.056**	-0.025*	-0.029*	0.054*
	(0.0130)	(0.0149)	(0.0277)	(0.0130)	(0.0149)	(0.0278)	(0.0129)	(0.0148)	(0.0277)	(0.0129)	(0.0149)	(0.0277)
Urban registration	-0.007	-0.008	0.016	-0.010	-0.011	0.021	-0.007	-0.008	0.016	-0.010	-0.011	0.021
	(0.0113)	(0.0130)	(0.0243)	(0.0113)	(0.0130)	(0.0243)	(0.0113)	(0.0130)	(0.0243)	(0.0113)	(0.0130)	(0.0243)
Full time job	-0.026**	-0.030**	0.056**	-0.025*	-0.029*	0.055*	-0.026**	-0.030**	0.056**	-0.026**	-0.030**	0.055**
	(0.0130)	(0.0150)	(0.0279)	(0.0130)	(0.0150)	(0.0279)	(0.0130)	(0.0150)	(0.0279)	(0.0130)	(0.0150)	(0.0279)

Public sector	-0.036***	-0.041***	0.078***	-0.033***	-0.039***	0.072***	-0.035***	-0.040***	0.075***	-0.032***	-0.037***	0.070***
	(0.0109)	(0.0125)	(0.0232)	(0.0109)	(0.0125)	(0.0232)	(0.0109)	(0.0125)	(0.0232)	(0.0109)	(0.0125)	(0.0231)
Healthy status	-0.004	-0.004	0.008	-0.005	-0.005	0.010	-0.003	-0.003	0.005	-0.004	-0.004	0.008
	(0.0172)	(0.0198)	(0.0370)	(0.0172)	(0.0199)	(0.0371)	(0.0172)	(0.0198)	(0.0370)	(0.0172)	(0.0199)	(0.0371)
Low social status	0.120***	0.139***	-0.259***	0.135***	0.156***	-0.291***	0.118***	0.136***	-0.254***	0.133***	0.153***	-0.286***
	(0.0291)	(0.0329)	(0.0611)	(0.0290)	(0.0325)	(0.0604)	(0.0290)	(0.0328)	(0.0610)	(0.0289)	(0.0325)	(0.0602)
Middle social status	0.068**	0.078**	-0.145**	0.079***	0.091***	-0.170***	0.066**	0.076**	-0.142**	0.078***	0.090***	-0.167***
	(0.0287)	(0.0327)	(0.0611)	(0.0286)	(0.0325)	(0.0607)	(0.0286)	(0.0326)	(0.0609)	(0.0285)	(0.0325)	(0.0606)
Medium-size firm	0.024**	0.028**	-0.052**	0.024**	0.027**	-0.051**	0.023**	0.026**	-0.049**	0.022*	0.026*	-0.048*
	(0.0115)	(0.0132)	(0.0247)	(0.0115)	(0.0133)	(0.0247)	(0.0115)	(0.0132)	(0.0246)	(0.0115)	(0.0132)	(0.0247)
Large-size firm	0.022*	0.025*	-0.046*	0.019	0.022	-0.041	0.020*	0.023*	-0.043*	0.018	0.020	-0.038
	(0.0123)	(0.0141)	(0.0263)	(0.0122)	(0.0141)	(0.0262)	(0.0122)	(0.0141)	(0.0262)	(0.0122)	(0.0141)	(0.0262)
East	-0.044***	-0.051***	0.096***	-0.049***	-0.056***	0.105***	-0.043***	-0.049***	0.092***	-0.047***	-0.054***	0.101***
	(0.0111)	(0.0127)	(0.0235)	(0.0111)	(0.0126)	(0.0233)	(0.0111)	(0.0127)	(0.0235)	(0.0110)	(0.0126)	(0.0233)
Central	-0.072***	-0.083***	0.154***	-0.072***	-0.083***	0.155***	-0.069***	-0.080***	0.149***	-0.070***	-0.081***	0.150***
	(0.0122)	(0.0138)	(0.0253)	(0.0122)	(0.0138)	(0.0253)	(0.0122)	(0.0138)	(0.0253)	(0.0122)	(0.0138)	(0.0253)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		203.20			194.30			212.96			203.90	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0469			0.0449			0.0492			0.0471	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 3 Marginal effects of reporting each answer category of job satisfaction with pay (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.041*	0.014*	-0.055*	0.040*	0.014*	-0.055*
							(0.0230)	(0.0081)	(0.0310)	(0.0231)	(0.0081)	(0.0311)
Actual years of schooling	-0.003	-0.001	0.005	-0.006*	-0.002*	0.008*	-0.004	-0.001	0.005	-0.006*	-0.002*	0.009*
	(0.0033)	(0.0012)	(0.0045)	(0.0033)	(0.0012)	(0.0044)	(0.0033)	(0.0012)	(0.0045)	(0.0033)	(0.0012)	(0.0044)
Overeducated	0.022	0.008	-0.030	0.022	0.008	-0.030	0.022	0.008	-0.030	0.022	0.008	-0.029
	(0.0197)	(0.0069)	(0.0266)	(0.0198)	(0.0069)	(0.0267)	(0.0197)	(0.0069)	(0.0266)	(0.0198)	(0.0069)	(0.0267)
Undereducated	-0.006	-0.002	0.008	-0.009	-0.003	0.012	-0.006	-0.002	0.009	-0.009	-0.003	0.012
	(0.0169)	(0.0059)	(0.0228)	(0.0169)	(0.0059)	(0.0228)	(0.0169)	(0.0059)	(0.0228)	(0.0169)	(0.0059)	(0.0228)
Age	0.006	0.002	-0.008	0.005	0.002	-0.007	0.006	0.002	-0.009	0.005	0.002	-0.007
	(0.0051)	(0.0018)	(0.0069)	(0.0051)	(0.0018)	(0.0069)	(0.0051)	(0.0018)	(0.0069)	(0.0051)	(0.0018)	(0.0069)
$Age^2/100$	-0.009	-0.003	0.013	-0.008	-0.003	0.011	-0.010	-0.003	0.013	-0.008	-0.003	0.011
	(0.0062)	(0.0022)	(0.0083)	(0.0062)	(0.0022)	(0.0083)	(0.0062)	(0.0022)	(0.0083)	(0.0062)	(0.0022)	(0.0083)
Hourly wage	-0.002***	-0.001***	0.003***				-0.002***	-0.001***	0.003***			
	(0.0006)	(0.0002)	(0.0008)				(0.0006)	(0.0002)	(0.0008)			
Male	0.012	0.004	-0.016	0.006	0.002	-0.008	0.011	0.004	-0.015	0.005	0.002	-0.007
	(0.0141)	(0.0049)	(0.0190)	(0.0141)	(0.0049)	(0.0190)	(0.0141)	(0.0049)	(0.0190)	(0.0140)	(0.0049)	(0.0190)
Ethnicity	0.009	0.003	-0.013	0.009	0.003	-0.013	0.007	0.002	-0.009	0.007	0.002	-0.009
	(0.0273)	(0.0095)	(0.0368)	(0.0273)	(0.0096)	(0.0369)	(0.0273)	(0.0095)	(0.0368)	(0.0273)	(0.0096)	(0.0369)
Political	0.012	0.004	-0.016	0.008	0.003	-0.011	0.012	0.004	-0.016	0.008	0.003	-0.011
	(0.0210)	(0.0073)	(0.0283)	(0.0210)	(0.0073)	(0.0283)	(0.0209)	(0.0073)	(0.0282)	(0.0209)	(0.0073)	(0.0283)
Married	-0.015	-0.005	0.020	-0.013	-0.005	0.018	-0.015	-0.005	0.020	-0.013	-0.005	0.018
	(0.0205)	(0.0072)	(0.0277)	(0.0206)	(0.0072)	(0.0278)	(0.0205)	(0.0072)	(0.0277)	(0.0205)	(0.0072)	(0.0277)
Urban registration	-0.025	-0.009	0.034	-0.030	-0.010	0.040	-0.025	-0.009	0.034	-0.030*	-0.010	0.040*
	(0.0181)	(0.0063)	(0.0244)	(0.0181)	(0.0064)	(0.0244)	(0.0181)	(0.0063)	(0.0244)	(0.0181)	(0.0064)	(0.0244)

Full time job	-0.039*	-0.014*	0.053*	-0.038*	-0.013*	0.051*	-0.039*	-0.014*	0.053*	-0.038*	-0.013*	0.052*
	(0.0209)	(0.0073)	(0.0281)	(0.0209)	(0.0074)	(0.0282)	(0.0208)	(0.0073)	(0.0281)	(0.0209)	(0.0074)	(0.0281)
Public sector	-0.008	-0.003	0.011	-0.003	-0.001	0.004	-0.008	-0.003	0.010	-0.002	-0.001	0.003
	(0.0173)	(0.0060)	(0.0233)	(0.0172)	(0.0060)	(0.0233)	(0.0173)	(0.0060)	(0.0233)	(0.0172)	(0.0060)	(0.0233)
Healthy status	-0.060**	-0.021**	0.081**	-0.062**	-0.022**	0.084**	-0.059**	-0.021**	0.080**	-0.062**	-0.022**	0.083**
	(0.0276)	(0.0097)	(0.0372)	(0.0277)	(0.0098)	(0.0373)	(0.0276)	(0.0097)	(0.0372)	(0.0277)	(0.0098)	(0.0373)
Low social status	0.212***	0.074***	-0.285***	0.241***	0.085***	-0.326***	0.210***	0.073***	-0.283***	0.240***	0.084***	-0.324***
	(0.0455)	(0.0162)	(0.0606)	(0.0451)	(0.0162)	(0.0598)	(0.0455)	(0.0162)	(0.0605)	(0.0451)	(0.0162)	(0.0598)
Middle social status	0.131***	0.046***	-0.176***	0.154***	0.054***	-0.208***	0.130***	0.045***	-0.175***	0.153***	0.054***	-0.207***
	(0.0451)	(0.0158)	(0.0604)	(0.0449)	(0.0158)	(0.0601)	(0.0451)	(0.0158)	(0.0604)	(0.0449)	(0.0158)	(0.0601)
Medium-size firm	0.015	0.005	-0.020	0.013	0.005	-0.018	0.014	0.005	-0.018	0.012	0.004	-0.016
	(0.0183)	(0.0064)	(0.0247)	(0.0183)	(0.0064)	(0.0248)	(0.0183)	(0.0064)	(0.0247)	(0.0183)	(0.0064)	(0.0248)
Large-size firm	0.025	0.009	-0.034	0.020	0.007	-0.027	0.024	0.008	-0.033	0.019	0.007	-0.025
	(0.0195)	(0.0068)	(0.0262)	(0.0194)	(0.0068)	(0.0262)	(0.0195)	(0.0068)	(0.0262)	(0.0194)	(0.0068)	(0.0262)
East	-0.061***	-0.021***	0.083***	-0.070***	-0.024***	0.094***	-0.060***	-0.021***	0.081***	-0.068***	-0.024***	0.092***
	(0.0175)	(0.0063)	(0.0235)	(0.0174)	(0.0063)	(0.0234)	(0.0175)	(0.0063)	(0.0236)	(0.0174)	(0.0063)	(0.0234)
Central	-0.096***	-0.033***	0.129***	-0.096***	-0.034***	0.130***	-0.094***	-0.033***	0.127***	-0.095***	-0.033***	0.128***
	(0.0190)	(0.0070)	(0.0254)	(0.0190)	(0.0070)	(0.0255)	(0.0190)	(0.0070)	(0.0254)	(0.0190)	(0.0070)	(0.0255)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		139.35			124.54			142.48			127.60	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0292			0.0261			0.0298			0.0267	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 4 Marginal effects of reporting each answer category of job satisfaction with welfare (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.038	0.008	-0.046	0.038	0.008	-0.046
							(0.0240)	(0.0050)	(0.0290)	(0.0241)	(0.0051)	(0.0291)
Actual years of schooling	-0.007**	-0.002**	0.009**	-0.010***	-0.002***	0.012***	-0.008**	-0.002**	0.009**	-0.011***	-0.002***	0.013***
	(0.0035)	(0.0007)	(0.0042)	(0.0034)	(0.0007)	(0.0041)	(0.0035)	(0.0007)	(0.0042)	(0.0034)	(0.0008)	(0.0041)
Overeducated	0.024	0.005	-0.028	0.024	0.005	-0.029	0.023	0.005	-0.028	0.023	0.005	-0.028
	(0.0208)	(0.0043)	(0.0250)	(0.0208)	(0.0044)	(0.0251)	(0.0207)	(0.0043)	(0.0250)	(0.0207)	(0.0044)	(0.0251)
Undereducated	0.022	0.005	-0.027	0.019	0.004	-0.023	0.022	0.005	-0.027	0.019	0.004	-0.023
	(0.0177)	(0.0037)	(0.0213)	(0.0177)	(0.0037)	(0.0214)	(0.0177)	(0.0037)	(0.0213)	(0.0177)	(0.0037)	(0.0214)
Age	0.005	0.001	-0.006	0.004	0.001	-0.004	0.005	0.001	-0.006	0.004	0.001	-0.005
	(0.0054)	(0.0011)	(0.0065)	(0.0054)	(0.0011)	(0.0065)	(0.0054)	(0.0011)	(0.0065)	(0.0054)	(0.0011)	(0.0065)
$Age^2/100$	-0.007	-0.002	0.009	-0.006	-0.001	0.007	-0.008	-0.002	0.009	-0.006	-0.001	0.007
	(0.0065)	(0.0014)	(0.0078)	(0.0065)	(0.0014)	(0.0079)	(0.0065)	(0.0014)	(0.0078)	(0.0065)	(0.0014)	(0.0079)
Hourly wage	-0.002***	-0.000***	0.003***				-0.002***	-0.000***	0.003***			
	(0.0006)	(0.0001)	(0.0008)				(0.0006)	(0.0001)	(0.0008)			
Male	0.021	0.004	-0.025	0.014	0.003	-0.017	0.020	0.004	-0.024	0.014	0.003	-0.017
	(0.0148)	(0.0031)	(0.0179)	(0.0147)	(0.0031)	(0.0178)	(0.0148)	(0.0031)	(0.0179)	(0.0147)	(0.0031)	(0.0178)
Ethnicity	-0.025	-0.005	0.030	-0.025	-0.005	0.030	-0.028	-0.006	0.033	-0.027	-0.006	0.033
	(0.0288)	(0.0060)	(0.0347)	(0.0288)	(0.0061)	(0.0349)	(0.0288)	(0.0060)	(0.0348)	(0.0288)	(0.0061)	(0.0349)
Political	0.003	0.001	-0.003	-0.001	-0.000	0.001	0.003	0.001	-0.003	-0.001	-0.000	0.001
	(0.0220)	(0.0045)	(0.0265)	(0.0220)	(0.0046)	(0.0266)	(0.0220)	(0.0045)	(0.0265)	(0.0220)	(0.0046)	(0.0266)
Married	-0.013	-0.003	0.015	-0.010	-0.002	0.013	-0.012	-0.002	0.015	-0.010	-0.002	0.012
	(0.0216)	(0.0045)	(0.0261)	(0.0216)	(0.0045)	(0.0261)	(0.0216)	(0.0045)	(0.0261)	(0.0216)	(0.0045)	(0.0261)
Urban registration	-0.066***	-0.014***	0.079***	-0.071***	-0.015***	0.086***	-0.066***	-0.014***	0.079***	-0.071***	-0.015***	0.086***
	(0.0189)	(0.0042)	(0.0228)	(0.0188)	(0.0043)	(0.0228)	(0.0189)	(0.0042)	(0.0228)	(0.0188)	(0.0043)	(0.0228)

Full time job	-0.068***	-0.014***	0.082***	-0.067***	-0.014***	0.081***	-0.069***	-0.014***	0.083***	-0.067***	-0.014***	0.081***
	(0.0219)	(0.0049)	(0.0265)	(0.0219)	(0.0049)	(0.0266)	(0.0219)	(0.0049)	(0.0265)	(0.0219)	(0.0049)	(0.0265)
Public sector	-0.036**	-0.007*	0.043**	-0.030*	-0.006*	0.037*	-0.035*	-0.007*	0.042*	-0.029	-0.006	0.036
	(0.0180)	(0.0038)	(0.0218)	(0.0180)	(0.0038)	(0.0218)	(0.0180)	(0.0038)	(0.0217)	(0.0180)	(0.0038)	(0.0218)
Healthy status	-0.023	-0.005	0.028	-0.026	-0.005	0.031	-0.022	-0.005	0.027	-0.025	-0.005	0.031
	(0.0292)	(0.0061)	(0.0352)	(0.0292)	(0.0062)	(0.0354)	(0.0292)	(0.0061)	(0.0352)	(0.0292)	(0.0062)	(0.0354)
Low social status	0.193***	0.040***	-0.233***	0.223***	0.047***	-0.270***	0.192***	0.040***	-0.231***	0.222***	0.047***	-0.269***
	(0.0460)	(0.0102)	(0.0550)	(0.0455)	(0.0105)	(0.0543)	(0.0460)	(0.0102)	(0.0551)	(0.0455)	(0.0105)	(0.0544)
Middle social status	0.121***	0.025***	-0.146***	0.145***	0.030***	-0.175***	0.120***	0.025**	-0.145***	0.144***	0.030***	-0.174***
	(0.0456)	(0.0097)	(0.0548)	(0.0453)	(0.0098)	(0.0545)	(0.0456)	(0.0097)	(0.0548)	(0.0453)	(0.0098)	(0.0545)
Medium-size firm	0.002	0.000	-0.003	0.001	0.000	-0.001	0.001	0.000	-0.001	-0.000	-0.000	0.000
	(0.0191)	(0.0040)	(0.0231)	(0.0191)	(0.0040)	(0.0232)	(0.0191)	(0.0040)	(0.0231)	(0.0191)	(0.0040)	(0.0232)
Large-size firm	-0.032	-0.007	0.039	-0.037*	-0.008*	0.045*	-0.033	-0.007	0.040	-0.039*	-0.008*	0.047*
	(0.0204)	(0.0043)	(0.0245)	(0.0203)	(0.0043)	(0.0246)	(0.0204)	(0.0043)	(0.0245)	(0.0203)	(0.0043)	(0.0246)
East	-0.088***	-0.018***	0.106***	-0.097***	-0.020***	0.117***	-0.086***	-0.018***	0.104***	-0.095***	-0.020***	0.115***
	(0.0183)	(0.0043)	(0.0220)	(0.0182)	(0.0045)	(0.0219)	(0.0183)	(0.0043)	(0.0221)	(0.0182)	(0.0044)	(0.0219)
Central	-0.089***	-0.018***	0.108***	-0.090***	-0.019***	0.109***	-0.088***	-0.018***	0.106***	-0.089***	-0.019***	0.107***
	(0.0198)	(0.0047)	(0.0239)	(0.0199)	(0.0047)	(0.0240)	(0.0198)	(0.0046)	(0.0239)	(0.0199)	(0.0047)	(0.0240)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		243.17			227.95			245.70			230.42	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0497			0.0466			0.0502			0.0471	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 5 Marginal effects of reporting each answer category of job satisfaction with workload (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.034	0.011	-0.045	0.034	0.011	-0.045
							(0.0229)	(0.0072)	(0.0300)	(0.0229)	(0.0073)	(0.0301)
Actual years of schooling	-0.010***	-0.003***	0.014***	-0.011***	-0.004***	0.015***	-0.011***	-0.003***	0.014***	-0.011***	-0.004***	0.015***
	(0.0032)	(0.0011)	(0.0042)	(0.0032)	(0.0010)	(0.0042)	(0.0032)	(0.0011)	(0.0043)	(0.0032)	(0.0010)	(0.0042)
Overeducated	0.002	0.001	-0.002	0.002	0.001	-0.003	0.001	0.000	-0.002	0.002	0.001	-0.002
	(0.0195)	(0.0061)	(0.0257)	(0.0195)	(0.0061)	(0.0257)	(0.0195)	(0.0061)	(0.0256)	(0.0195)	(0.0061)	(0.0256)
Undereducated	0.015	0.005	-0.020	0.015	0.005	-0.019	0.015	0.005	-0.020	0.014	0.005	-0.019
	(0.0166)	(0.0052)	(0.0218)	(0.0166)	(0.0052)	(0.0218)	(0.0166)	(0.0052)	(0.0218)	(0.0166)	(0.0052)	(0.0218)
Age	0.002	0.001	-0.003	0.002	0.001	-0.002	0.002	0.001	-0.003	0.002	0.001	-0.002
	(0.0050)	(0.0016)	(0.0066)	(0.0050)	(0.0016)	(0.0066)	(0.0050)	(0.0016)	(0.0066)	(0.0050)	(0.0016)	(0.0066)
$Age^2/100$	-0.004	-0.001	0.005	-0.004	-0.001	0.005	-0.004	-0.001	0.006	-0.004	-0.001	0.005
	(0.0061)	(0.0019)	(0.0080)	(0.0061)	(0.0019)	(0.0080)	(0.0061)	(0.0019)	(0.0080)	(0.0061)	(0.0019)	(0.0080)
Hourly wage	-0.001	-0.000	0.001				-0.001	-0.000	0.001			
	(0.0004)	(0.0001)	(0.0006)				(0.0004)	(0.0001)	(0.0006)			
Male	0.017	0.005	-0.022	0.015	0.005	-0.020	0.016	0.005	-0.022	0.015	0.005	-0.020
	(0.0139)	(0.0044)	(0.0183)	(0.0138)	(0.0044)	(0.0182)	(0.0139)	(0.0044)	(0.0182)	(0.0138)	(0.0044)	(0.0182)
Ethnicity	-0.001	-0.000	0.001	-0.000	-0.000	0.001	-0.003	-0.001	0.004	-0.003	-0.001	0.004
	(0.0271)	(0.0085)	(0.0357)	(0.0271)	(0.0086)	(0.0357)	(0.0272)	(0.0086)	(0.0357)	(0.0272)	(0.0086)	(0.0357)
Political	0.027	0.008	-0.035	0.025	0.008	-0.033	0.027	0.008	-0.035	0.025	0.008	-0.033
	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)
Married	0.017	0.005	-0.022	0.017	0.005	-0.022	0.017	0.005	-0.022	0.017	0.005	-0.022
	(0.0204)	(0.0064)	(0.0268)	(0.0204)	(0.0064)	(0.0268)	(0.0204)	(0.0064)	(0.0268)	(0.0204)	(0.0064)	(0.0268)
Urban registration	-0.030*	-0.009*	0.039*	-0.031*	-0.010*	0.041*	-0.030*	-0.009*	0.039*	-0.031*	-0.010*	0.041*
	(0.0178)	(0.0057)	(0.0234)	(0.0177)	(0.0057)	(0.0233)	(0.0178)	(0.0057)	(0.0233)	(0.0177)	(0.0057)	(0.0233)

Full time job	-0.028	-0.009	0.037	-0.027	-0.009	0.036	-0.029	-0.009	0.038	-0.027	-0.009	0.036
	(0.0205)	(0.0065)	(0.0270)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)	(0.0205)	(0.0065)	(0.0269)
Public sector	-0.050***	-0.016***	0.065***	-0.048***	-0.015***	0.063***	-0.049***	-0.015***	0.064***	-0.047***	-0.015***	0.062***
	(0.0170)	(0.0055)	(0.0223)	(0.0170)	(0.0055)	(0.0222)	(0.0170)	(0.0055)	(0.0223)	(0.0170)	(0.0055)	(0.0222)
Healthy status	-0.043	-0.013	0.056	-0.044	-0.014	0.057	-0.042	-0.013	0.055	-0.043	-0.013	0.056
	(0.0272)	(0.0086)	(0.0357)	(0.0272)	(0.0087)	(0.0357)	(0.0271)	(0.0086)	(0.0357)	(0.0271)	(0.0086)	(0.0357)
Low social status	0.144***	0.045***	-0.189***	0.154***	0.049***	-0.203***	0.142***	0.045***	-0.187***	0.152***	0.048***	-0.200***
	(0.0423)	(0.0137)	(0.0553)	(0.0416)	(0.0135)	(0.0543)	(0.0423)	(0.0137)	(0.0553)	(0.0416)	(0.0135)	(0.0543)
Middle social status	0.085**	0.027**	-0.112**	0.094**	0.030**	-0.123**	0.084**	0.026**	-0.110**	0.093**	0.029**	-0.122**
	(0.0419)	(0.0133)	(0.0550)	(0.0414)	(0.0132)	(0.0543)	(0.0419)	(0.0133)	(0.0549)	(0.0414)	(0.0132)	(0.0543)
Medium-size firm	0.019	0.006	-0.025	0.018	0.006	-0.024	0.018	0.006	-0.024	0.017	0.005	-0.023
	(0.0180)	(0.0057)	(0.0236)	(0.0180)	(0.0057)	(0.0236)	(0.0180)	(0.0057)	(0.0236)	(0.0180)	(0.0057)	(0.0236)
Large-size firm	0.037*	0.012*	-0.049*	0.036*	0.011*	-0.047*	0.036*	0.011*	-0.047*	0.034*	0.011*	-0.045*
	(0.0191)	(0.0061)	(0.0251)	(0.0191)	(0.0061)	(0.0251)	(0.0191)	(0.0061)	(0.0251)	(0.0191)	(0.0061)	(0.0251)
East	-0.046***	-0.015***	0.061***	-0.048***	-0.015***	0.064***	-0.045***	-0.014**	0.059***	-0.047***	-0.015**	0.062***
	(0.0173)	(0.0056)	(0.0227)	(0.0172)	(0.0056)	(0.0226)	(0.0173)	(0.0056)	(0.0227)	(0.0172)	(0.0056)	(0.0226)
Central	-0.086***	-0.027***	0.114***	-0.087***	-0.027***	0.114***	-0.085***	-0.027***	0.111***	-0.085***	-0.027***	0.112***
	(0.0187)	(0.0063)	(0.0245)	(0.0187)	(0.0063)	(0.0245)	(0.0187)	(0.0063)	(0.0245)	(0.0187)	(0.0063)	(0.0245)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		136.04			134.40			138.23			136.59	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0283			0.0279			0.0287			0.0284	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 6 Marginal effects of reporting each answer category of job satisfaction on working conditions and facilities (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.045**	0.031**	-0.076**	0.045**	0.031**	-0.076**
							(0.0182)	(0.0126)	(0.0306)	(0.0182)	(0.0127)	(0.0307)
Actual years of schooling	-0.015***	-0.010***	0.025***	-0.017***	-0.012***	0.028***	-0.015***	-0.011***	0.026***	-0.017***	-0.012***	0.029***
	(0.0027)	(0.0018)	(0.0044)	(0.0026)	(0.0018)	(0.0043)	(0.0027)	(0.0018)	(0.0044)	(0.0026)	(0.0018)	(0.0043)
Overeducated	0.011	0.008	-0.019	0.011	0.008	-0.019	0.011	0.007	-0.018	0.011	0.008	-0.018
	(0.0157)	(0.0108)	(0.0265)	(0.0157)	(0.0109)	(0.0265)	(0.0156)	(0.0108)	(0.0265)	(0.0156)	(0.0109)	(0.0265)
Undereducated	-0.022*	-0.015*	0.037*	-0.024*	-0.016*	0.040*	-0.022*	-0.015*	0.037*	-0.024*	-0.017*	0.040*
	(0.0132)	(0.0091)	(0.0223)	(0.0132)	(0.0092)	(0.0224)	(0.0132)	(0.0091)	(0.0223)	(0.0132)	(0.0092)	(0.0223)
Age	0.006	0.004	-0.011	0.006	0.004	-0.010	0.007	0.005	-0.011	0.006	0.004	-0.010
	(0.0040)	(0.0028)	(0.0068)	(0.0040)	(0.0028)	(0.0068)	(0.0040)	(0.0028)	(0.0067)	(0.0040)	(0.0028)	(0.0068)
$Age^2/100$	-0.008*	-0.006*	0.014*	-0.007	-0.005	0.012	-0.008*	-0.006*	0.014*	-0.007	-0.005	0.012
	(0.0048)	(0.0034)	(0.0082)	(0.0048)	(0.0034)	(0.0082)	(0.0048)	(0.0034)	(0.0082)	(0.0048)	(0.0034)	(0.0082)
Hourly wage	-0.002***	-0.001***	0.003***				-0.002***	-0.001***	0.003***			
	(0.0005)	(0.0003)	(0.0008)				(0.0005)	(0.0003)	(0.0008)			
Male	0.023**	0.016**	-0.038**	0.019*	0.013*	-0.032*	0.022**	0.015**	-0.038**	0.018*	0.013*	-0.031*
	(0.0111)	(0.0077)	(0.0187)	(0.0110)	(0.0077)	(0.0187)	(0.0111)	(0.0077)	(0.0187)	(0.0110)	(0.0077)	(0.0187)
Ethnicity	-0.005	-0.004	0.009	-0.005	-0.004	0.009	-0.008	-0.006	0.014	-0.008	-0.006	0.014
	(0.0214)	(0.0148)	(0.0362)	(0.0214)	(0.0149)	(0.0363)	(0.0214)	(0.0148)	(0.0362)	(0.0214)	(0.0149)	(0.0363)
Political	-0.002	-0.001	0.003	-0.004	-0.003	0.007	-0.002	-0.001	0.003	-0.004	-0.003	0.007
	(0.0164)	(0.0114)	(0.0278)	(0.0164)	(0.0114)	(0.0279)	(0.0164)	(0.0114)	(0.0278)	(0.0164)	(0.0114)	(0.0278)
Married	-0.015	-0.010	0.025	-0.014	-0.009	0.023	-0.015	-0.010	0.025	-0.013	-0.009	0.023
	(0.0162)	(0.0112)	(0.0274)	(0.0162)	(0.0113)	(0.0275)	(0.0162)	(0.0112)	(0.0273)	(0.0162)	(0.0113)	(0.0274)
Urban registration	-0.012	-0.008	0.020	-0.016	-0.011	0.027	-0.012	-0.008	0.021	-0.016	-0.011	0.027
	(0.0141)	(0.0098)	(0.0239)	(0.0141)	(0.0098)	(0.0239)	(0.0141)	(0.0098)	(0.0239)	(0.0141)	(0.0098)	(0.0238)

Full time job	-0.033**	-0.023**	0.056**	-0.032**	-0.023**	0.055**	-0.033**	-0.023**	0.057**	-0.033**	-0.023**	0.056**
	(0.0162)	(0.0113)	(0.0274)	(0.0162)	(0.0113)	(0.0274)	(0.0162)	(0.0113)	(0.0274)	(0.0162)	(0.0113)	(0.0274)
Public sector	-0.015	-0.010	0.025	-0.011	-0.008	0.019	-0.014	-0.010	0.023	-0.010	-0.007	0.017
	(0.0135)	(0.0094)	(0.0229)	(0.0135)	(0.0094)	(0.0229)	(0.0135)	(0.0094)	(0.0229)	(0.0135)	(0.0094)	(0.0229)
Healthy status	-0.003	-0.002	0.005	-0.004	-0.003	0.008	-0.002	-0.001	0.003	-0.004	-0.003	0.006
	(0.0215)	(0.0149)	(0.0364)	(0.0215)	(0.0150)	(0.0365)	(0.0215)	(0.0149)	(0.0363)	(0.0215)	(0.0150)	(0.0365)
Low social status	0.096***	0.067***	-0.163***	0.116***	0.081***	-0.197***	0.094***	0.065***	-0.159***	0.114***	0.079***	-0.194***
	(0.0342)	(0.0237)	(0.0575)	(0.0338)	(0.0235)	(0.0567)	(0.0341)	(0.0236)	(0.0574)	(0.0338)	(0.0234)	(0.0566)
Middle social status	0.050	0.035	-0.085	0.066**	0.046**	-0.112**	0.049	0.034	-0.083	0.065*	0.045*	-0.109*
	(0.0338)	(0.0234)	(0.0571)	(0.0336)	(0.0233)	(0.0567)	(0.0338)	(0.0234)	(0.0570)	(0.0335)	(0.0233)	(0.0566)
Medium-size firm	-0.007	-0.005	0.012	-0.008	-0.005	0.013	-0.008	-0.006	0.014	-0.009	-0.006	0.016
	(0.0142)	(0.0099)	(0.0241)	(0.0143)	(0.0099)	(0.0242)	(0.0142)	(0.0099)	(0.0241)	(0.0142)	(0.0099)	(0.0241)
Large-size firm	-0.034**	-0.024**	0.058**	-0.037**	-0.026**	0.063**	-0.036**	-0.025**	0.060**	-0.039**	-0.027**	0.066**
	(0.0152)	(0.0106)	(0.0257)	(0.0152)	(0.0106)	(0.0257)	(0.0152)	(0.0106)	(0.0257)	(0.0152)	(0.0106)	(0.0257)
East	-0.024*	-0.017*	0.041*	-0.030**	-0.021**	0.052**	-0.023	-0.016	0.038*	-0.029**	-0.020**	0.049**
	(0.0138)	(0.0096)	(0.0233)	(0.0137)	(0.0096)	(0.0232)	(0.0138)	(0.0096)	(0.0233)	(0.0137)	(0.0096)	(0.0232)
Central	-0.032**	-0.022**	0.054**	-0.032**	-0.022**	0.054**	-0.030**	-0.021**	0.050**	-0.030**	-0.021**	0.051**
	(0.0149)	(0.0103)	(0.0251)	(0.0149)	(0.0104)	(0.0252)	(0.0149)	(0.0103)	(0.0251)	(0.0149)	(0.0104)	(0.0252)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		193.73			182.33			199.80			188.41	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0424			0.0399			0.0437			0.0413	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 7 Marginal effects of reporting each answer category of job satisfaction with colleagues (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.010*	0.041*	-0.050*	0.010*	0.041*	-0.051*
							(0.0056)	(0.0226)	(0.0281)	(0.0056)	(0.0226)	(0.0281)
Actual years of schooling	-0.002**	-0.009**	0.011**	-0.002***	-0.010***	0.012***	-0.002**	-0.009***	0.011***	-0.002***	-0.010***	0.013***
	(0.0009)	(0.0034)	(0.0042)	(0.0009)	(0.0033)	(0.0041)	(0.0009)	(0.0034)	(0.0042)	(0.0009)	(0.0033)	(0.0041)
Overeducated	-0.000	-0.002	0.002	-0.000	-0.001	0.001	-0.001	-0.002	0.003	-0.000	-0.002	0.002
	(0.0050)	(0.0203)	(0.0252)	(0.0050)	(0.0203)	(0.0252)	(0.0049)	(0.0203)	(0.0252)	(0.0049)	(0.0203)	(0.0252)
Undereducated	-0.004	-0.018	0.022	-0.005	-0.019	0.023	-0.004	-0.018	0.022	-0.005	-0.019	0.024
	(0.0041)	(0.0167)	(0.0208)	(0.0041)	(0.0167)	(0.0208)	(0.0041)	(0.0167)	(0.0207)	(0.0041)	(0.0167)	(0.0207)
Age	0.000	0.001	-0.002	0.000	0.001	-0.001	0.000	0.002	-0.002	0.000	0.001	-0.001
	(0.0012)	(0.0051)	(0.0063)	(0.0012)	(0.0051)	(0.0063)	(0.0012)	(0.0051)	(0.0063)	(0.0012)	(0.0051)	(0.0063)
$Age^2/100$	-0.001	-0.002	0.003	-0.000	-0.002	0.002	-0.001	-0.003	0.003	-0.001	-0.002	0.003
	(0.0015)	(0.0062)	(0.0077)	(0.0015)	(0.0062)	(0.0077)	(0.0015)	(0.0062)	(0.0077)	(0.0015)	(0.0062)	(0.0077)
Hourly wage	-0.000	-0.001	0.001				-0.000	-0.001	0.001			
	(0.0002)	(0.0006)	(0.0008)				(0.0002)	(0.0006)	(0.0008)			
Male	0.001	0.005	-0.007	0.001	0.003	-0.003	0.001	0.005	-0.006	0.001	0.002	-0.003
	(0.0034)	(0.0140)	(0.0175)	(0.0034)	(0.0139)	(0.0174)	(0.0034)	(0.0140)	(0.0174)	(0.0034)	(0.0139)	(0.0173)
Ethnicity	0.011	0.043	-0.054	0.011	0.043	-0.054	0.010	0.040	-0.050	0.010	0.040	-0.050
	(0.0070)	(0.0281)	(0.0349)	(0.0070)	(0.0281)	(0.0349)	(0.0070)	(0.0281)	(0.0350)	(0.0070)	(0.0281)	(0.0350)
Political	-0.017***	-0.069***	0.086***	-0.017***	-0.071***	0.088***	-0.017***	-0.070***	0.087***	-0.017***	-0.071***	0.089***
	(0.0059)	(0.0226)	(0.0281)	(0.0059)	(0.0226)	(0.0281)	(0.0059)	(0.0226)	(0.0281)	(0.0059)	(0.0226)	(0.0281)
Married	0.003	0.013	-0.016	0.003	0.014	-0.017	0.003	0.013	-0.016	0.003	0.014	-0.017
	(0.0050)	(0.0206)	(0.0256)	(0.0050)	(0.0205)	(0.0256)	(0.0050)	(0.0205)	(0.0256)	(0.0050)	(0.0205)	(0.0255)

Urban registration	0.007	0.028	-0.035	0.006	0.025	-0.032	0.007	0.028	-0.035	0.006	0.025	-0.031
	(0.0044)	(0.0177)	(0.0221)	(0.0044)	(0.0177)	(0.0220)	(0.0044)	(0.0177)	(0.0220)	(0.0044)	(0.0177)	(0.0220)
Full time job	-0.012**	-0.047**	0.059**	-0.011**	-0.047**	0.058**	-0.012**	-0.047**	0.059**	-0.012**	-0.047**	0.059**
	(0.0050)	(0.0197)	(0.0246)	(0.0050)	(0.0197)	(0.0245)	(0.0050)	(0.0197)	(0.0245)	(0.0050)	(0.0197)	(0.0245)
Public sector	-0.000	-0.000	0.000	0.001	0.002	-0.003	0.000	0.001	-0.001	0.001	0.003	-0.004
	(0.0042)	(0.0174)	(0.0216)	(0.0042)	(0.0173)	(0.0215)	(0.0042)	(0.0174)	(0.0216)	(0.0042)	(0.0173)	(0.0215)
Healthy status	-0.003	-0.010	0.013	-0.003	-0.011	0.014	-0.002	-0.010	0.012	-0.003	-0.010	0.013
	(0.0066)	(0.0268)	(0.0334)	(0.0066)	(0.0268)	(0.0334)	(0.0065)	(0.0268)	(0.0333)	(0.0066)	(0.0268)	(0.0334)
Low social status	0.003	0.014	-0.017	0.007	0.029	-0.036	0.003	0.012	-0.014	0.007	0.027	-0.033
	(0.0102)	(0.0416)	(0.0518)	(0.0100)	(0.0409)	(0.0509)	(0.0102)	(0.0416)	(0.0518)	(0.0100)	(0.0409)	(0.0509)
Middle social status	-0.005	-0.022	0.028	-0.002	-0.010	0.012	-0.006	-0.023	0.029	-0.003	-0.011	0.014
	(0.0101)	(0.0412)	(0.0513)	(0.0100)	(0.0408)	(0.0508)	(0.0101)	(0.0412)	(0.0512)	(0.0100)	(0.0408)	(0.0507)
Medium-size firm	-0.014***	-0.057***	0.071***	-0.014***	-0.058***	0.073***	-0.014***	-0.058***	0.073***	-0.015***	-0.060***	0.074***
	(0.0046)	(0.0178)	(0.0221)	(0.0047)	(0.0178)	(0.0221)	(0.0046)	(0.0178)	(0.0221)	(0.0047)	(0.0178)	(0.0221)
Large-size firm	-0.017***	-0.068***	0.084***	-0.017***	-0.070***	0.088***	-0.017***	-0.069***	0.086***	-0.017***	-0.072***	0.089***
	(0.0051)	(0.0193)	(0.0239)	(0.0051)	(0.0192)	(0.0239)	(0.0051)	(0.0193)	(0.0239)	(0.0051)	(0.0192)	(0.0239)
East	0.005	0.021	-0.026	0.004	0.018	-0.022	0.006	0.023	-0.028	0.005	0.019	-0.024
	(0.0043)	(0.0175)	(0.0217)	(0.0043)	(0.0174)	(0.0216)	(0.0043)	(0.0175)	(0.0217)	(0.0043)	(0.0174)	(0.0217)
Central	-0.005	-0.022	0.027	-0.005	-0.022	0.027	-0.005	-0.020	0.024	-0.005	-0.019	0.024
	(0.0047)	(0.0192)	(0.0238)	(0.0047)	(0.0192)	(0.0239)	(0.0047)	(0.0192)	(0.0239)	(0.0047)	(0.0192)	(0.0239)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		83.48			80.43			86.63			83.63	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0300			0.0289			0.0311			0.0300	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 8 Marginal effects of reporting each answer category of job satisfaction with the relationship with the boss (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.032***	0.080***	-0.112***	0.032***	0.080***	-0.112***
							(0.0092)	(0.0226)	(0.0314)	(0.0092)	(0.0226)	(0.0315)
Actual years of schooling	-0.007***	-0.018***	0.025***	-0.008***	-0.020***	0.028***	-0.007***	-0.019***	0.026***	-0.008***	-0.021***	0.029***
	(0.0014)	(0.0034)	(0.0047)	(0.0014)	(0.0033)	(0.0046)	(0.0014)	(0.0034)	(0.0047)	(0.0014)	(0.0033)	(0.0046)
Overeducated	0.016*	0.039*	-0.055*	0.016*	0.039*	-0.055*	0.015*	0.039*	-0.054*	0.015*	0.039*	-0.054*
	(0.0080)	(0.0200)	(0.0280)	(0.0080)	(0.0201)	(0.0280)	(0.0080)	(0.0200)	(0.0279)	(0.0080)	(0.0200)	(0.0279)
Undereducated	-0.015**	-0.039**	0.054**	-0.016**	-0.041**	0.057**	-0.015**	-0.039**	0.054**	-0.016**	-0.041**	0.057**
	(0.0068)	(0.0169)	(0.0236)	(0.0068)	(0.0170)	(0.0237)	(0.0068)	(0.0169)	(0.0236)	(0.0068)	(0.0169)	(0.0236)
Age	0.001	0.003	-0.004	0.001	0.002	-0.003	0.001	0.003	-0.005	0.001	0.003	-0.004
	(0.0020)	(0.0051)	(0.0071)	(0.0020)	(0.0051)	(0.0071)	(0.0020)	(0.0051)	(0.0071)	(0.0020)	(0.0051)	(0.0071)
$Age^2/100$	-0.002	-0.004	0.006	-0.001	-0.003	0.005	-0.002	-0.005	0.007	-0.002	-0.004	0.006
	(0.0025)	(0.0062)	(0.0086)	(0.0025)	(0.0062)	(0.0087)	(0.0025)	(0.0062)	(0.0086)	(0.0025)	(0.0062)	(0.0086)
Hourly wage	-0.001***	-0.002***	0.003***				-0.001***	-0.002***	0.003***			
	(0.0003)	(0.0007)	(0.0010)				(0.0003)	(0.0007)	(0.0009)			
Male	-0.004	-0.011	0.015	-0.006	-0.015	0.021	-0.005	-0.011	0.016	-0.006	-0.016	0.022
	(0.0056)	(0.0141)	(0.0197)	(0.0056)	(0.0140)	(0.0196)	(0.0056)	(0.0141)	(0.0196)	(0.0056)	(0.0140)	(0.0196)
Ethnicity	0.001	0.003	-0.004	0.001	0.003	-0.004	-0.001	-0.004	0.005	-0.001	-0.004	0.005
	(0.0107)	(0.0270)	(0.0377)	(0.0107)	(0.0271)	(0.0378)	(0.0107)	(0.0270)	(0.0376)	(0.0107)	(0.0270)	(0.0377)
Political	-0.021**	-0.052**	0.073**	-0.022**	-0.056**	0.078**	-0.021**	-0.053**	0.074**	-0.022**	-0.056***	0.079***
	(0.0088)	(0.0218)	(0.0305)	(0.0088)	(0.0218)	(0.0305)	(0.0088)	(0.0218)	(0.0304)	(0.0088)	(0.0218)	(0.0305)
Married	-0.010	-0.025	0.035	-0.009	-0.023	0.033	-0.010	-0.025	0.034	-0.009	-0.023	0.032
	(0.0081)	(0.0204)	(0.0285)	(0.0081)	(0.0204)	(0.0285)	(0.0081)	(0.0203)	(0.0284)	(0.0081)	(0.0204)	(0.0284)
Urban registration	-0.001	-0.002	0.003	-0.003	-0.007	0.009	-0.001	-0.002	0.003	-0.003	-0.007	0.010
	(0.0071)	(0.0180)	(0.0251)	(0.0071)	(0.0179)	(0.0250)	(0.0071)	(0.0179)	(0.0250)	(0.0071)	(0.0179)	(0.0250)

Full time job	-0.017**	-0.043**	0.059**	-0.017**	-0.042**	0.059**	-0.017**	-0.043**	0.060**	-0.017**	-0.043**	0.060**
	(0.0082)	(0.0204)	(0.0284)	(0.0082)	(0.0204)	(0.0284)	(0.0081)	(0.0203)	(0.0283)	(0.0081)	(0.0203)	(0.0283)
Public sector	-0.020***	-0.052***	0.072***	-0.019***	-0.047***	0.066***	-0.020***	-0.050***	0.069***	-0.018***	-0.045***	0.063***
	(0.0070)	(0.0173)	(0.0241)	(0.0070)	(0.0173)	(0.0241)	(0.0070)	(0.0172)	(0.0240)	(0.0069)	(0.0172)	(0.0240)
Healthy status	0.005	0.012	-0.017	0.004	0.009	-0.013	0.006	0.014	-0.020	0.004	0.011	-0.015
	(0.0110)	(0.0277)	(0.0387)	(0.0110)	(0.0277)	(0.0387)	(0.0109)	(0.0276)	(0.0386)	(0.0109)	(0.0277)	(0.0386)
Low social status	0.037**	0.093**	-0.131**	0.047***	0.119***	-0.167***	0.035**	0.089**	-0.125**	0.046**	0.115***	-0.161***
	(0.0180)	(0.0448)	(0.0626)	(0.0179)	(0.0442)	(0.0618)	(0.0179)	(0.0447)	(0.0624)	(0.0178)	(0.0441)	(0.0616)
Middle social status	0.026	0.065	-0.090	0.034*	0.085*	-0.119*	0.025	0.062	-0.087	0.033*	0.083*	-0.116*
	(0.0178)	(0.0445)	(0.0621)	(0.0177)	(0.0442)	(0.0617)	(0.0176)	(0.0444)	(0.0619)	(0.0176)	(0.0441)	(0.0615)
Medium-size firm	0.009	0.023	-0.032	0.008	0.021	-0.030	0.008	0.020	-0.028	0.007	0.019	-0.026
	(0.0073)	(0.0183)	(0.0255)	(0.0073)	(0.0183)	(0.0255)	(0.0072)	(0.0182)	(0.0254)	(0.0072)	(0.0183)	(0.0255)
Large-size firm	0.016**	0.040**	-0.056**	0.014*	0.035*	-0.049*	0.015*	0.037*	-0.052*	0.013*	0.033*	-0.046*
	(0.0078)	(0.0194)	(0.0271)	(0.0078)	(0.0194)	(0.0271)	(0.0077)	(0.0194)	(0.0270)	(0.0077)	(0.0194)	(0.0270)
East	-0.004	-0.009	0.012	-0.006	-0.016	0.022	-0.002	-0.005	0.007	-0.005	-0.012	0.017
	(0.0069)	(0.0175)	(0.0245)	(0.0069)	(0.0174)	(0.0243)	(0.0069)	(0.0175)	(0.0244)	(0.0069)	(0.0174)	(0.0243)
Central	-0.027***	-0.067***	0.094***	-0.027***	-0.067***	0.094***	-0.025***	-0.063***	0.087***	-0.025***	-0.063***	0.087***
	(0.0078)	(0.0190)	(0.0265)	(0.0078)	(0.0191)	(0.0266)	(0.0077)	(0.0190)	(0.0265)	(0.0078)	(0.0191)	(0.0266)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		153.06			142.93			165.43			155.22	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0402			0.0376			0.0435			0.0408	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 9 Marginal effects of reporting each answer category of job satisfaction with commuting distance to job satisfaction (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.012	0.011	-0.024	0.013	0.011	-0.024
							(0.0169)	(0.0152)	(0.0321)	(0.0169)	(0.0152)	(0.0321)
Actual years of schooling	-0.003	-0.003	0.006	-0.004*	-0.004*	0.008*	-0.003	-0.003	0.006	-0.004*	-0.004*	0.008*
	(0.0025)	(0.0022)	(0.0047)	(0.0024)	(0.0022)	(0.0046)	(0.0025)	(0.0022)	(0.0047)	(0.0024)	(0.0022)	(0.0046)
Overeducated	0.005	0.005	-0.010	0.005	0.005	-0.010	0.005	0.005	-0.010	0.005	0.005	-0.010
	(0.0147)	(0.0132)	(0.0279)	(0.0147)	(0.0132)	(0.0279)	(0.0147)	(0.0132)	(0.0279)	(0.0147)	(0.0132)	(0.0279)
Undereducated	-0.004	-0.004	0.008	-0.005	-0.005	0.010	-0.004	-0.004	0.008	-0.005	-0.005	0.010
	(0.0124)	(0.0112)	(0.0236)	(0.0124)	(0.0112)	(0.0236)	(0.0124)	(0.0111)	(0.0236)	(0.0124)	(0.0112)	(0.0236)
Age	0.005	0.004	-0.009	0.004	0.004	-0.008	0.005	0.004	-0.009	0.004	0.004	-0.008
	(0.0038)	(0.0034)	(0.0072)	(0.0038)	(0.0034)	(0.0072)	(0.0038)	(0.0034)	(0.0072)	(0.0038)	(0.0034)	(0.0072)
$Age^2/100$	-0.007	-0.006	0.013	-0.006	-0.006	0.012	-0.007	-0.006	0.013	-0.006	-0.006	0.012
	(0.0046)	(0.0041)	(0.0087)	(0.0046)	(0.0041)	(0.0087)	(0.0046)	(0.0041)	(0.0087)	(0.0046)	(0.0041)	(0.0087)
Hourly wage	-0.001**	-0.001**	0.002**				-0.001**	-0.001**	0.002**			
	(0.0005)	(0.0004)	(0.0009)				(0.0005)	(0.0004)	(0.0009)			
Male	0.020*	0.018*	-0.037*	0.017	0.015	-0.031	0.019*	0.017*	-0.037*	0.016	0.015	-0.031
	(0.0104)	(0.0094)	(0.0197)	(0.0104)	(0.0093)	(0.0197)	(0.0104)	(0.0094)	(0.0197)	(0.0104)	(0.0093)	(0.0197)
Ethnicity	0.026	0.023	-0.049	0.026	0.023	-0.049	0.025	0.022	-0.047	0.025	0.022	-0.047
	(0.0204)	(0.0183)	(0.0387)	(0.0205)	(0.0184)	(0.0388)	(0.0205)	(0.0184)	(0.0388)	(0.0205)	(0.0184)	(0.0388)
Political	-0.044***	-0.039***	0.083***	-0.045***	-0.041***	0.086***	-0.044***	-0.039***	0.083***	-0.045***	-0.041***	0.086***
	(0.0160)	(0.0143)	(0.0301)	(0.0160)	(0.0143)	(0.0301)	(0.0160)	(0.0143)	(0.0301)	(0.0160)	(0.0143)	(0.0301)
Married	0.001	0.001	-0.003	0.002	0.002	-0.004	0.002	0.001	-0.003	0.002	0.002	-0.005
	(0.0151)	(0.0136)	(0.0288)	(0.0152)	(0.0136)	(0.0288)	(0.0151)	(0.0136)	(0.0287)	(0.0152)	(0.0136)	(0.0288)
Urban registration	0.000	0.000	-0.000	-0.003	-0.003	0.005	0.000	0.000	-0.000	-0.003	-0.003	0.006
	(0.0133)	(0.0119)	(0.0252)	(0.0132)	(0.0119)	(0.0251)	(0.0133)	(0.0119)	(0.0252)	(0.0132)	(0.0119)	(0.0251)

Full time job	-0.026*	-0.024*	0.050*	-0.026*	-0.023*	0.049*	-0.027*	-0.024*	0.050*	-0.026*	-0.023*	0.049*
	(0.0152)	(0.0137)	(0.0288)	(0.0152)	(0.0137)	(0.0288)	(0.0152)	(0.0137)	(0.0288)	(0.0152)	(0.0137)	(0.0288)
Public sector	-0.009	-0.008	0.017	-0.006	-0.006	0.012	-0.009	-0.008	0.017	-0.006	-0.006	0.012
	(0.0127)	(0.0114)	(0.0240)	(0.0126)	(0.0114)	(0.0240)	(0.0127)	(0.0114)	(0.0240)	(0.0126)	(0.0114)	(0.0240)
Healthy status	0.008	0.007	-0.016	0.007	0.006	-0.013	0.008	0.008	-0.016	0.007	0.006	-0.013
	(0.0205)	(0.0184)	(0.0390)	(0.0205)	(0.0185)	(0.0390)	(0.0205)	(0.0184)	(0.0389)	(0.0205)	(0.0185)	(0.0390)
Low social status	0.086***	0.078***	-0.164***	0.103***	0.092***	-0.195***	0.086***	0.077***	-0.163***	0.102***	0.092***	-0.194***
	(0.0331)	(0.0295)	(0.0623)	(0.0327)	(0.0291)	(0.0613)	(0.0331)	(0.0295)	(0.0623)	(0.0327)	(0.0291)	(0.0613)
Middle social status	0.045	0.040	-0.085	0.057*	0.052*	-0.109*	0.044	0.040	-0.084	0.057*	0.051*	-0.108*
	(0.0327)	(0.0293)	(0.0619)	(0.0324)	(0.0291)	(0.0614)	(0.0327)	(0.0293)	(0.0619)	(0.0324)	(0.0291)	(0.0614)
Medium-size firm	0.018	0.016	-0.034	0.017	0.015	-0.032	0.018	0.016	-0.033	0.016	0.015	-0.031
	(0.0134)	(0.0120)	(0.0253)	(0.0134)	(0.0120)	(0.0254)	(0.0134)	(0.0120)	(0.0254)	(0.0134)	(0.0120)	(0.0254)
Large-size firm	-0.005	-0.004	0.009	-0.008	-0.007	0.015	-0.005	-0.005	0.010	-0.008	-0.007	0.015
	(0.0143)	(0.0129)	(0.0272)	(0.0143)	(0.0129)	(0.0272)	(0.0143)	(0.0129)	(0.0272)	(0.0143)	(0.0129)	(0.0272)
East	-0.012	-0.010	0.022	-0.016	-0.014	0.030	-0.011	-0.010	0.021	-0.015	-0.014	0.029
	(0.0129)	(0.0116)	(0.0244)	(0.0128)	(0.0115)	(0.0243)	(0.0129)	(0.0116)	(0.0245)	(0.0128)	(0.0115)	(0.0243)
Central	-0.054***	-0.049***	0.103***	-0.054***	-0.049***	0.103***	-0.054***	-0.048***	0.102***	-0.054***	-0.048***	0.102***
	(0.0142)	(0.0126)	(0.0266)	(0.0143)	(0.0127)	(0.0267)	(0.0143)	(0.0127)	(0.0266)	(0.0143)	(0.0127)	(0.0267)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		87.61			80.70			88.14			81.25	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0210			0.0194			0.0211			0.0195	

*** p<0.10, ** p<0.05, *** p<0.010**

Table B 10 Marginal effects of reporting each answer category of job satisfaction with housing benefits (controlling for actual years of schooling)

Variables	Specification 1			Specification 2			Specification 3			Specification 4		
	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied	Dissatisfied	Indifferent	Satisfied
Skill mismatch							0.075**	-0.010**	-0.066**	0.075**	-0.009**	-0.066**
							(0.0303)	(0.0041)	(0.0265)	(0.0304)	(0.0040)	(0.0266)
Actual years of schooling	0.002	-0.000	-0.002	-0.001	0.000	0.001	0.001	-0.000	-0.001	-0.002	0.000	0.002
	(0.0043)	(0.0005)	(0.0037)	(0.0042)	(0.0005)	(0.0037)	(0.0043)	(0.0005)	(0.0037)	(0.0042)	(0.0005)	(0.0037)
Overeducated	-0.078***	0.010***	0.069***	-0.078***	0.010***	0.068***	-0.079***	0.010***	0.069***	-0.078***	0.010***	0.069***
	(0.0253)	(0.0035)	(0.0221)	(0.0253)	(0.0035)	(0.0222)	(0.0253)	(0.0035)	(0.0221)	(0.0253)	(0.0035)	(0.0221)
Undereducated	-0.016	0.002	0.014	-0.018	0.002	0.016	-0.016	0.002	0.014	-0.019	0.002	0.016
	(0.0218)	(0.0028)	(0.0191)	(0.0219)	(0.0028)	(0.0191)	(0.0218)	(0.0028)	(0.0191)	(0.0218)	(0.0028)	(0.0191)
Age	0.009	-0.001	-0.008	0.008	-0.001	-0.007	0.010	-0.001	-0.008	0.008	-0.001	-0.007
	(0.0066)	(0.0009)	(0.0058)	(0.0066)	(0.0008)	(0.0058)	(0.0066)	(0.0009)	(0.0058)	(0.0066)	(0.0008)	(0.0058)
$Age^2/100$	-0.013	0.002	0.011	-0.011	0.001	0.010	-0.013	0.002	0.011	-0.012	0.001	0.010
	(0.0080)	(0.0010)	(0.0070)	(0.0080)	(0.0010)	(0.0070)	(0.0080)	(0.0010)	(0.0070)	(0.0080)	(0.0010)	(0.0070)
Hourly wage	-0.002***	0.000***	0.002***				-0.002***	0.000***	0.002***			
	(0.0008)	(0.0001)	(0.0007)				(0.0008)	(0.0001)	(0.0007)			
Male	0.016	-0.002	-0.014	0.010	-0.001	-0.008	0.015	-0.002	-0.013	0.009	-0.001	-0.008
	(0.0182)	(0.0023)	(0.0159)	(0.0182)	(0.0023)	(0.0159)	(0.0182)	(0.0023)	(0.0159)	(0.0182)	(0.0023)	(0.0159)
Ethnicity	-0.006	0.001	0.006	-0.006	0.001	0.005	-0.012	0.001	0.010	-0.011	0.001	0.010
	(0.0358)	(0.0045)	(0.0313)	(0.0358)	(0.0045)	(0.0314)	(0.0358)	(0.0045)	(0.0313)	(0.0359)	(0.0045)	(0.0314)
Political	0.004	-0.001	-0.004	-0.000	0.000	0.000	0.004	-0.001	-0.004	-0.001	0.000	0.001
	(0.0267)	(0.0034)	(0.0233)	(0.0267)	(0.0033)	(0.0234)	(0.0267)	(0.0034)	(0.0233)	(0.0267)	(0.0033)	(0.0233)
Married	-0.094***	0.012***	0.082***	-0.092***	0.011***	0.080***	-0.094***	0.012***	0.082***	-0.091***	0.011***	0.080***
	(0.0268)	(0.0038)	(0.0234)	(0.0268)	(0.0038)	(0.0235)	(0.0267)	(0.0038)	(0.0234)	(0.0268)	(0.0037)	(0.0235)
Urban registration	-0.048**	0.006**	0.042**	-0.053**	0.007**	0.047**	-0.048**	0.006**	0.042**	-0.053**	0.007**	0.046**
	(0.0235)	(0.0031)	(0.0206)	(0.0235)	(0.0031)	(0.0206)	(0.0235)	(0.0031)	(0.0205)	(0.0234)	(0.0031)	(0.0205)

Full time job	-0.081***	0.010***	0.071***	-0.078***	0.010***	0.068***	-0.082***	0.010***	0.071***	-0.079***	0.010***	0.069***
	(0.0273)	(0.0037)	(0.0239)	(0.0273)	(0.0037)	(0.0240)	(0.0273)	(0.0037)	(0.0239)	(0.0273)	(0.0037)	(0.0240)
Public sector	-0.037	0.005	0.032	-0.030	0.004	0.027	-0.035	0.004	0.030	-0.028	0.004	0.025
	(0.0223)	(0.0029)	(0.0195)	(0.0223)	(0.0028)	(0.0195)	(0.0223)	(0.0029)	(0.0195)	(0.0223)	(0.0028)	(0.0195)
Healthy status	-0.017	0.002	0.015	-0.020	0.002	0.017	-0.015	0.002	0.013	-0.018	0.002	0.016
	(0.0358)	(0.0045)	(0.0313)	(0.0359)	(0.0045)	(0.0314)	(0.0357)	(0.0045)	(0.0312)	(0.0358)	(0.0045)	(0.0313)
Low social status	0.181***	-0.023***	-0.158***	0.214***	-0.027***	-0.187***	0.178***	-0.022***	-0.155***	0.211***	-0.026***	-0.184***
	(0.0540)	(0.0077)	(0.0471)	(0.0531)	(0.0079)	(0.0464)	(0.0539)	(0.0077)	(0.0471)	(0.0530)	(0.0078)	(0.0464)
Middle social status	0.095*	-0.012*	-0.083*	0.122**	-0.015**	-0.107**	0.093*	-0.012*	-0.081*	0.120**	-0.015**	-0.105**
	(0.0535)	(0.0071)	(0.0467)	(0.0530)	(0.0071)	(0.0463)	(0.0534)	(0.0070)	(0.0466)	(0.0529)	(0.0071)	(0.0462)
Medium-size firm	0.048**	-0.006*	-0.042**	0.046*	-0.006*	-0.041*	0.046*	-0.006*	-0.040*	0.044*	-0.006*	-0.039*
	(0.0237)	(0.0031)	(0.0207)	(0.0237)	(0.0031)	(0.0208)	(0.0237)	(0.0031)	(0.0207)	(0.0237)	(0.0031)	(0.0207)
Large-size firm	0.014	-0.002	-0.012	0.008	-0.001	-0.007	0.011	-0.001	-0.010	0.005	-0.001	-0.004
	(0.0252)	(0.0032)	(0.0220)	(0.0251)	(0.0031)	(0.0220)	(0.0252)	(0.0032)	(0.0220)	(0.0251)	(0.0031)	(0.0220)
East	-0.080***	0.010***	0.070***	-0.089***	0.011***	0.078***	-0.076***	0.010***	0.067***	-0.086***	0.011***	0.075***
	(0.0228)	(0.0032)	(0.0200)	(0.0227)	(0.0033)	(0.0199)	(0.0228)	(0.0032)	(0.0200)	(0.0227)	(0.0032)	(0.0199)
Central	-0.110***	0.014***	0.096***	-0.111***	0.014***	0.097***	-0.106***	0.013***	0.093***	-0.107***	0.013***	0.093***
	(0.0245)	(0.0037)	(0.0216)	(0.0246)	(0.0037)	(0.0216)	(0.0246)	(0.0037)	(0.0216)	(0.0246)	(0.0036)	(0.0217)
Observations	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
LR chi2		147.59			136.45			153.76			142.55	
Prob > chi2		0.0000			0.0000			0.0000			0.0000	
Pseudo R^2		0.0300			0.0277			0.0312			0.0290	

*** p<0.10, ** p<0.05, *** p<0.010**

Appendix C

Table C 1 Occupation category in Migrant sample

Aggregate occupation category	Occupations	Number of observations
Administrative staff and manager	Managers Clerks Security, warehouse and property management	818
Businessman/commercial staff	Retail of vegetable/ fruits/ grains/ other agricultural by-products, and others Sales recycling and other buyer	448
Service personnel	restaurant and hotel staff housemaids, household worker hairdresser, beautician, Masseur, tourist guide auto and home appliance repair cleaning and sanitizing chefs and butcher kitchen assistance drivers and conductors other service area	1024
Manufacture and transportation worker	delivery and transport worker construction labourers manufacturing repair and manufacturing service other factory process	1011
Total		3301

Table C 2 Industry classification in the migrant sample

Broad Industry Classification	Industry	Migrant workers
Agriculture, forestry and animal husbandry	Agriculture, Forestry, Animal husbandry, Fishery	2 (0.06%)
Manufacture, production and construction	Mining	5 (0.15%)
	Manufacturing	864 (26.17%)
	Production and Supply of Electricity, Gas and Water	4 (0.12%)
	Construction Enterprise	359 (10.88%)
Transportation and Information	Transport, Storage and Post Industry	94 (2.85%)
	Information Transmission, Computer Services and Software	23 (0.70%)
Service	Wholesale and Retail Trade	544 (16.48%)
	Hotel and Catering Services	655 (19.84%)
	Services to Households and Other Services	239 (7.24%)
Business and Finance	Financial Intermediation	13 (0.39%)
	Real Estate Industry	206 (6.24%)
	Leasing and Business Services	34 (1.03%)
Public	Scientific Research, Technical Service	75 (2.27%)
	Management of Water Conservancy, Environment and Public Facilities	13 (0.39%)
	Education	35 (1.06%)
	Health, Social Security and Social Welfare	89 (2.70%)
	Culture, Sport and Entertainment	46 (1.39%)
	Public Management and Social Organizations	1 (0.03%)
	International Organization	0 (0.00%)
Total		3301

Table C 3 Industries for migrant workers by wage distribution

Industry	0~10th	10th ~25th	25th~50th	50th ~75th	75th ~90th	90th ~100th
			Old generation of migrant workers			
Agriculture, forestry and animal husbandry	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.30%)	0 (0.00%)	0 (0.00%)
Manufacture and Construction	42 (28.97%)	84 (38.36%)	142 (40.92%)	177 (53.15%)	100 (44.25%)	66 (53.66%)
Transportation and Information	4 (2.76%)	7 (3.20%)	20 (5.76%)	9 (2.70%)	12 (5.31%)	10 (8.13%)
Finance and Business	12 (8.28%)	17 (7.76%)	30 (8.65%)	25 (7.51%)	18 (7.96%)	9 (7.32%)
Public	19 (13.10%)	36 (16.44%)	38 (10.95%)	31 (9.31%)	21 (9.29%)	10 (8.13%)
Service	68 (46.90%)	75 (34.25%)	117 (33.72%)	90 (27.03%)	75 (33.19%)	28 (22.76%)
Total	145 (38.36%)	219 (48.24%)	347 (41.96%)	333 (40.76%)	226 (41.70%)	123 (43.46%)
			New generation of migrant workers			
Agriculture and other	0 (0.00%)	0 (0.00%)	1 (0.21%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Manufacture and Construction	48 (12.70%)	47 (20%)	148 (30.83%)	189 (39.05%)	121 (38.29%)	68 (42.5%)
Transportation and Information	1 (0.43%)	6 (2.55%)	12 (2.50%)	23 (4.75%)	11 (3.48%)	2 (1.25%)
Finance and Business	10 (4.29%)	9 (3.83%)	40 (8.33%)	36 (7.44%)	34 (10.76%)	13 (8.13%)
Public	13 (5.58%)	11 (4.68%)	25 (5.21%)	28 (5.79%)	21 (6.65%)	6 (3.75%)
Service	161 (69.10%)	162 (68.94%)	254 (52.92%)	208 (42.98%)	129 (40.82%)	71 (44.38%)
Total	233 (61.64%)	235 (51.76%)	480 (58.04%)	484 (59.24%)	316 (58.30%)	160 (56.54%)
Total	378 (100%)	454 (100%)	827 (100%)	817 (100%)	542 (100%)	283 (100%)

Table C 4 Incidence of educational mismatch by industries among migrant workers

Industry	Undereducation	Correct Education	Overeducation
Agriculture, forestry and animal husbandry	1 (50%)	0 (0.00%)	1 (50%)
Manufacture and Construction	181(14.69%)	841 (68.26%)	210 (17.05%)
Transportation and Information	10 (8.55%)	77 (65.81%)	30 (25.64%)
Finance and Business	24 (9.49%)	201 (79.45%)	28 (11.07%)
Public	49 (18.92%)	175 (67.57%)	35 (13.51%)
Service	135 (9.39%)	1056 (73.44%)	247 (17.18%)
Total	400 (12.12%)	2350 (71.19%)	551 (16.69%)

Table C 5 OLS VS QR Model 1 for the old generation migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0242***	0.0121**	0.0169***	0.0223***	0.0264***	0.0348***
	(0.0039)	(0.0057)	(0.0053)	(0.0046)	(0.0047)	(0.0070)
Training	0.0657**	0.119***	0.103***	0.0524	0.0646*	-0.0153
	(0.0256)	(0.0438)	(0.0291)	(0.0396)	(0.0343)	(0.0411)
male	0.189***	0.120***	0.172***	0.174***	0.202***	0.257***
	(0.0236)	(0.0348)	(0.0281)	(0.0290)	(0.0373)	(0.0466)
Married	0.0306	0.0578	0.0613	0.0499	-0.0126	-0.0134
	(0.0349)	(0.0625)	(0.0429)	(0.0527)	(0.0426)	(0.0648)
Ethnicity	0.0664	0.0444	0.185	0.0192	-0.0142	0.0865
	(0.0782)	(0.1263)	(0.1802)	(0.0955)	(0.1211)	(0.1125)
Age	-0.00234	-0.0197	-0.0169	-0.0237	-0.00846	0.0229
	(0.0150)	(0.0261)	(0.0184)	(0.0180)	(0.0205)	(0.0252)
age^2	-0.000124	0.0000646	0.0000334	0.0000979	-0.0000544	-0.000364
	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Tenure of current job	0.0301***	0.0191**	0.0219***	0.0316***	0.0436***	0.0448***
	(0.0050)	(0.0085)	(0.0064)	(0.0063)	(0.0081)	(0.0093)
Tenure squared	-0.000568***	-0.000256	-0.000281	-0.000620**	-0.000859**	-0.00115***
	(0.0002)	(0.0004)	(0.0003)	(0.0003)	(0.0004)	(0.0004)
Agriculture, Forestry, Animal husbandry	0.0357	0.499**	0.314**	0.0673	-0.178	-0.488*
	(0.0513)	(0.2330)	(0.1518)	(0.0599)	(0.1111)	(0.2562)
Manufacture, production and construction	0.0628**	0.105**	0.00661	0.0865**	0.0580	0.0446
	(0.0282)	(0.0463)	(0.0351)	(0.0352)	(0.0441)	(0.0542)
Information Transmission and Transportation	0.0337	0.105	-0.00887	0.0492	0.0184	0.0862
	(0.0563)	(0.0789)	(0.0666)	(0.0767)	(0.0898)	(0.1180)
Business and Finance	-0.0650	-0.0488	-0.0445	-0.0762	-0.0762	-0.128*
	(0.0432)	(0.0620)	(0.0554)	(0.0536)	(0.0625)	(0.0686)
Public	-0.0399	-0.0515	-0.0267	0.0132	-0.0941*	-0.163
	(0.0389)	(0.0636)	(0.0552)	(0.0494)	(0.0528)	(0.1088)
State	-0.0357	-0.0112	-0.0786**	-0.0621*	-0.0188	-0.0531
	(0.0286)	(0.0415)	(0.0369)	(0.0360)	(0.0384)	(0.0579)
Firm size 1 (1 to 5 employees)	-0.0689	-0.0848	-0.113	-0.0722	-0.0529	-0.0551
	(0.0463)	(0.0736)	(0.0703)	(0.0600)	(0.0631)	(0.1093)
Firm size 2 (6 to 20 employees)	-0.0427	0.0825	-0.00233	-0.0474	-0.0446	-0.119*
	(0.0310)	(0.0510)	(0.0380)	(0.0391)	(0.0372)	(0.0657)
Firm size 3 (21 to 99 employees)	0.0253	0.0763*	0.00678	0.0116	0.0512	0.00157
	(0.0274)	(0.0453)	(0.0402)	(0.0330)	(0.0354)	(0.0522)
Permanent	0.0271	0.0301	-0.00452	0.0597	0.00438	-0.00196
	(0.0369)	(0.0532)	(0.0496)	(0.0476)	(0.0446)	(0.0762)
Long term	0.0724**	0.127***	0.104***	0.0676*	0.0503	0.0301
	(0.0283)	(0.0406)	(0.0349)	(0.0351)	(0.0391)	(0.0544)
Short term	0.0216	0.0721	0.0374	0.0210	-0.0440	-0.00699
	(0.0393)	(0.0637)	(0.0484)	(0.0440)	(0.0561)	(0.0897)
Henan	-0.356***	-0.449***	-0.356***	-0.347***	-0.282***	-0.354***
	(0.0564)	(0.1234)	(0.0750)	(0.0746)	(0.0798)	(0.0774)
Anhui	-0.308***	-0.342***	-0.305***	-0.265***	-0.289***	-0.337***
	(0.0496)	(0.0850)	(0.0545)	(0.0723)	(0.0604)	(0.0860)
Chongqing	-0.335***	-0.344***	-0.356***	-0.327***	-0.404***	-0.340***
	(0.0410)	(0.0689)	(0.0540)	(0.0514)	(0.0572)	(0.0951)
Shanghai	0.0619	0.00227	0.0208	0.0974	0.0845	0.0484
	(0.0456)	(0.0595)	(0.0569)	(0.0673)	(0.0582)	(0.0773)
Jiangsu	-0.0880**	-0.109*	-0.0391	-0.0679	-0.128***	-0.147**
	(0.0370)	(0.0565)	(0.0489)	(0.0489)	(0.0472)	(0.0741)
Zhejiang	-0.0347	-0.00263	-0.0103	-0.0500	-0.0582	-0.0545
	(0.0356)	(0.0519)	(0.0462)	(0.0481)	(0.0543)	(0.0642)
Hubei	-0.268***	-0.260***	-0.225***	-0.230***	-0.285***	-0.370***
	(0.0419)	(0.0851)	(0.0621)	(0.0487)	(0.0603)	(0.0757)
Sichuan	-0.0580	-0.252***	-0.110	-0.0403	-0.0150	0.0128
	(0.0493)	(0.0748)	(0.0804)	(0.0634)	(0.0882)	(0.0872)
Constant	1.724***	1.726***	1.734***	2.230***	2.167***	1.568***
	(0.3244)	(0.5425)	(0.4080)	(0.3997)	(0.4461)	(0.5356)
Observations	1393	1393	1393	1393	1393	1393
R^2	0.347					

Table C 6 OLS VS QR Model 1 for the new generation migrant workers

Variables	OLS	Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)
Years of schooling	0.0307***	0.0226***	0.0333***	0.0381***	0.0394***	0.0288***
	(0.0046)	(0.0080)	(0.0064)	(0.0068)	(0.0055)	(0.0072)
Training	0.0954***	0.0979***	0.0990***	0.0757**	0.0878***	0.122***
	(0.0209)	(0.0355)	(0.0255)	(0.0299)	(0.0292)	(0.0327)
male	0.0811***	0.0452	0.0530**	0.102***	0.0927***	0.124***
	(0.0196)	(0.0319)	(0.0245)	(0.0284)	(0.0237)	(0.0338)
Married	-0.000992	-0.0256	0.0311	0.0105	0.00115	0.0247
	(0.0285)	(0.0469)	(0.0376)	(0.0374)	(0.0411)	(0.0535)
Ethnicity	0.133	0.258	0.0774	0.139	0.181	-0.0804
	(0.1005)	(0.1975)	(0.1240)	(0.0956)	(0.1513)	(0.3138)
Age	0.213***	0.286***	0.252***	0.189***	0.185***	0.134*
	(0.0404)	(0.0739)	(0.0539)	(0.0550)	(0.0597)	(0.0694)
age^2	-0.00405***	-0.00570***	-0.00498***	-0.00357***	-0.00340***	-0.00232
	(0.0009)	(0.0016)	(0.0012)	(0.0012)	(0.0013)	(0.0015)
Tenure of current job	0.0532***	0.0546**	0.0597***	0.0595***	0.0393**	0.0344*
	(0.0133)	(0.0219)	(0.0187)	(0.0176)	(0.0162)	(0.0207)
Tenure squared	-0.00285	-0.00515**	-0.00485*	-0.00421*	-0.0000926	0.000588
	(0.0019)	(0.0025)	(0.0026)	(0.0025)	(0.0023)	(0.0030)
Agriculture, Forestry, Animal husbandry	-0.147**	0.384*	0.123	-0.200*	-0.456**	-0.511*
	(0.0569)	(0.1968)	(0.0843)	(0.1105)	(0.2287)	(0.2894)
Manufacture, production and construction	0.0329	0.0212	0.0374	0.0529	0.0304	0.0388
	(0.0248)	(0.0438)	(0.0310)	(0.0322)	(0.0347)	(0.0469)
Information Transmission and Transportation	0.0441	-0.0193	0.121*	0.0106	0.0155	0.0118
	(0.0490)	(0.1149)	(0.0638)	(0.0590)	(0.0730)	(0.0907)
Business and Finance	0.0377	0.00816	0.0764	0.0245	0.00176	0.0651
	(0.0364)	(0.0833)	(0.0473)	(0.0456)	(0.0598)	(0.0676)
Public	-0.00570	-0.156	-0.000169	0.0611	0.0428	-0.0593
	(0.0461)	(0.0970)	(0.0825)	(0.0516)	(0.0548)	(0.0733)
State	0.0757***	0.0985	0.0913***	0.0667*	0.0651*	0.0814*
	(0.0276)	(0.0646)	(0.0351)	(0.0384)	(0.0332)	(0.0445)
Firm size 1(1 to 5 employees)	-0.199***	-0.259***	-0.226***	-0.197***	-0.178***	-0.109**
	(0.0369)	(0.0606)	(0.0467)	(0.0471)	(0.0558)	(0.0552)
Firm size 2 (6 to 20 employees)	-0.0775**	-0.0783	-0.113***	-0.0628	-0.0832*	-0.00571
	(0.0308)	(0.0540)	(0.0410)	(0.0396)	(0.0505)	(0.0483)
Firm size 3 (21 to 99 employees)	0.000116	0.0278	-0.00268	0.0242	-0.0161	-0.00373
	(0.0241)	(0.0401)	(0.0327)	(0.0326)	(0.0337)	(0.0376)
Permanent	0.0682**	0.101**	0.0650	0.0562	0.0851*	0.0747
	(0.0328)	(0.0513)	(0.0438)	(0.0451)	(0.0464)	(0.0565)
Long term	0.117***	0.114**	0.130***	0.141***	0.0918***	0.0969**
	(0.0257)	(0.0455)	(0.0363)	(0.0346)	(0.0335)	(0.0438)
Short term	0.0707**	0.115**	0.105**	0.0512	-0.000156	0.0543
	(0.0325)	(0.0456)	(0.0424)	(0.0398)	(0.0465)	(0.0584)
Henan	-0.365***	-0.432***	-0.395***	-0.359***	-0.339***	-0.358***
	(0.0440)	(0.0695)	(0.0545)	(0.0606)	(0.0659)	(0.0658)
Anhui	-0.373***	-0.408***	-0.350***	-0.369***	-0.369***	-0.390***
	(0.0363)	(0.0561)	(0.0547)	(0.0522)	(0.0518)	(0.0612)
Chongqing	-0.421***	-0.367***	-0.394***	-0.443***	-0.475***	-0.392***
	(0.0422)	(0.0594)	(0.0513)	(0.0506)	(0.0613)	(0.0687)
Shanghai	-0.0880**	-0.168*	-0.0744	-0.0209	-0.0702	-0.1000
	(0.0419)	(0.0971)	(0.0581)	(0.0576)	(0.0508)	(0.0655)
Jiangsu	-0.0844***	-0.0627	-0.0275	-0.0818**	-0.135***	-0.137***
	(0.0316)	(0.0494)	(0.0407)	(0.0416)	(0.0442)	(0.0482)
Zhejiang	-0.142***	-0.115**	-0.114***	-0.101**	-0.148***	-0.199***
	(0.0303)	(0.0532)	(0.0418)	(0.0424)	(0.0381)	(0.0469)
Hubei	-0.383***	-0.378***	-0.402***	-0.430***	-0.404***	-0.285***
	(0.0402)	(0.0465)	(0.0421)	(0.0579)	(0.0661)	(0.0883)
Sichuan	-0.248***	-0.332***	-0.246***	-0.212***	-0.295***	-0.213***
	(0.0403)	(0.0729)	(0.0619)	(0.0453)	(0.0580)	(0.0609)
Constant	-1.277***	-2.550***	-1.912***	-1.130*	-0.835	0.261
	(0.4636)	(0.8314)	(0.6066)	(0.6148)	(0.7213)	(0.8731)
Observations	1908	1908	1908	1908	1908	1908
R^2	0.336					

Table C 7 Heckman sample selection results in the migrant sample

	Model 1		Model 2		Model 3	
Variables	**Selection equation**	**Wage equation**	**Selection equation**	**Wage equation**	**Selection equation**	**Wage equation**
Years of schooling		0.0308***		0.0311***		0.0311***
		(0.0028)		(0.0028)		(0.0028)
Healthy status	0.9504***				1.0226***	
	(0.1731)				(0.1765)	
Young children			-1.0141***		-1.0282***	
			(0.0730)		(0.0735)	
Training		0.0991***		0.0972***		0.0969***
		(0.0167)		(0.0167)		(0.0167)
male		0.1277***		0.1276***		0.1274***
		(0.0153)		(0.0153)		(0.0153)
Married		-0.0003		0.0052		0.0096
		(0.0211)		(0.0217)		(0.0217)
Ethnicity		0.0987		0.0961		0.0967
		(0.0606)		(0.0606)		(0.0606)
Age		0.0484***		0.0482***		0.0487***
		(0.0056)		(0.0056)		(0.0056)
age^2		-0.0007***		-0.0007***		-0.0007***
		(0.0001)		(0.0001)		(0.0001)
Tenure of current job		0.0332***		0.0336***		0.0338***
		(0.0042)		(0.0042)		(0.0042)
Tenure squared		-0.0007***		-0.0007***		-0.0007***
		(0.0002)		(0.0002)		(0.0002)
Agriculture, Forestry, Animal husbandry		-0.0179		-0.0199		-0.0239
		(0.2877)		(0.2880)		(0.2878)
Manufacture, production and construction		0.0576***		0.0569***		0.0555***
		(0.0188)		(0.0189)		(0.0189)
Information Transmission and Transportation		0.0412		0.0434		0.0442
		(0.0400)		(0.0400)		(0.0400)
Business and Finance		0.0050		0.0012		0.0017
		(0.0288)		(0.0288)		(0.0287)
Public		-0.0355		-0.0362		-0.0364
		(0.0287)		(0.0287)		(0.0287)
State		0.0101		0.0112		0.0116
		(0.0207)		(0.0207)		(0.0207)
Firm size 1 (1 to 5 employees)		-0.1489***		-0.1473***		-0.1464***
		(0.0279)		(0.0280)		(0.0279)
Firm size 2 (6 to 20 employees)		-0.0597***		-0.0591***		-0.0584***
		(0.0219)		(0.0219)		(0.0219)
Firm size 3 (21 to 99 employees)		0.0124		0.0129		0.0135
		(0.0183)		(0.0183)		(0.0183)
Permanent		0.0581**		0.0598**		0.0594**
		(0.0237)		(0.0237)		(0.0237)
Long term		0.1040***		0.1061***		0.1062***
		(0.0186)		(0.0187)		(0.0186)
Short term		0.0522**		0.0533**		0.0538**
		(0.0247)		(0.0247)		(0.0247)
Henan		-0.3481***		-0.3468***		-0.3445***
		(0.0316)		(0.0317)		(0.0317)
Anhui		-0.3410***		-0.3386***		-0.3387***
		(0.0299)		(0.0299)		(0.0299)
Chongqing		-0.3942***		-0.3943***		-0.3943***
		(0.0293)		(0.0293)		(0.0293)
Shanghai		-0.0292		-0.0300		-0.0311
		(0.0297)		(0.0297)		(0.0297)
Jiangsu		-0.0899***		-0.0887***		-0.0891***
		(0.0246)		(0.0246)		(0.0246)
Zhejiang		-0.0975***		-0.0974***		-0.0964***
		(0.0239)		(0.0239)		(0.0239)
Hubei		-0.3475***		-0.3460***		-0.3458***
		(0.0293)		(0.0293)		(0.0293)
Sichuan		-0.1663***		-0.1666***		-0.1658***
		(0.0302)		(0.0302)		(0.0302)
F value		52.13		51.90		52.06
Prob > F		0.0000		0.0000		0.0000
Inverse Mills Ratio		-0.4293**		-0.0799		-0.1446**
		(0.1800)		(0.0750)		(0.0691)
Number of observations	3596	3330	3596	3330	3596	3330

Table C 8 Heckman sample selection results in the urban sample

	Model 1		Model 2		Model 3	
Variables	**Selection equation**	**Wage equation**	**Selection equation**	**Wage equation**	**Selection equation**	**Wage equation**
Years of schooling		0.0570***		0.0571***		0.0570***
		(0.0027)		(0.0027)		(0.0027)
Healthy status	0.9107***				0.8738***	
	(0.0736)				(0.0741)	
Young children			0.5020***		0.4914***	
			(0.0304)		(0.0306)	
male		0.1691***		0.1681***		0.1668***
		(0.0162)		(0.0162)		(0.0162)
Married		0.0740***		0.0613**		0.0516*
		(0.0257)		(0.0276)		(0.0269)
Ethnicity		0.0690		0.0716		0.0736
		(0.0778)		(0.0779)		(0.0779)
age		0.0125		0.0098		0.0089
		(0.0082)		(0.0083)		(0.0082)
age^2		-0.0002*		-0.0001		-0.0001
		(0.0001)		(0.0001)		(0.0001)
Tenure of current job		0.0263***		0.0264***		0.0261***
		(0.0031)		(0.0031)		(0.0031)
Tenure squared		-0.0005***		-0.0005***		-0.0005***
		(0.0001)		(0.0001)		(0.0001)
Agriculture, Forestry, Animal husbandry		0.3879***		0.3948***		0.3956***
		(0.0905)		(0.0906)		(0.0905)
Manufacture, production and construction		0.1177***		0.1182***		0.1184***
		(0.0233)		(0.0233)		(0.0233)
Information Transmission and Transportation		0.1960***		0.1973***		0.1980***
		(0.0273)		(0.0273)		(0.0273)
Business and Finance		0.2841***		0.2864***		0.2860***
		(0.0297)		(0.0297)		(0.0297)
Public		0.2679***		0.2686***		0.2689***
		(0.0243)		(0.0243)		(0.0243)
State		-0.0356*		-0.0366*		-0.0364*
		(0.0190)		(0.0191)		(0.0191)
Firm size 1 (1 to 5 employees)		-0.1667***		-0.1668***		-0.1669***
		(0.0401)		(0.0402)		(0.0401)
Firm size 2 (6 to 20 employees)		-0.1438***		-0.1444***		-0.1441***
		(0.0239)		(0.0239)		(0.0239)
Firm size 3 (21 to 99 employees)		-0.0329*		-0.0326*		-0.0323*
		(0.0188)		(0.0188)		(0.0188)
Permanent		0.4100***		0.4115***		0.4102***
		(0.0329)		(0.0329)		(0.0329)
Long term		0.2429***		0.2450***		0.2431***
		(0.0280)		(0.0280)		(0.0280)
Short term		-0.0434		-0.0407		-0.0430
		(0.0441)		(0.0441)		(0.0441)
Henan		-0.7872***		-0.7838***		-0.7817***
		(0.0306)		(0.0307)		(0.0306)
Anhui		-0.7673***		-0.7639***		-0.7612***
		(0.0305)		(0.0307)		(0.0306)
Chongqing		-0.6417***		-0.6404***		-0.6373***
		(0.0337)		(0.0338)		(0.0337)
Shanghai		-0.1478***		-0.1485***		-0.1436***
		(0.0304)		(0.0305)		(0.0305)
Jiangsu		-0.4581***		-0.4572***		-0.4535***
		(0.0305)		(0.0306)		(0.0306)
Zhejiang		-0.2520***		-0.2530***		-0.2493***
		(0.0307)		(0.0308)		(0.0308)
Hubei		-0.5316***		-0.5289***		-0.5253***
		(0.0332)		(0.0333)		(0.0333)
Sichuan		-0.5899***		-0.5895***		-0.5849***
		(0.0300)		(0.0301)		(0.0301)
F value		132.56		132.10		132.47
Prob > F		0.0000		0.0000		0.0000
Inverse Mills Ratio		-0.3173***		-0.0988		-0.1789***
		(0.1007)		(0.0755)		(0.0623)
Number of observations	8913	5932	8913	5932	8913	5932

Table C 9 Studies exploring wage returns to education in urban China: Over time

Study	Year	Wage returns to education
(Zhou, 2000)	1955, 1960, 1965, 1975, 1978, 1984, 1987, 1991, 1992, 1993, 1994.	**Junior high school:** (1) Insignificant in 1960, 1965 and 1978; (2) 5.0 in 1984, 7.0 in 1987, 9.0 in 1991 and 11.0 in 1993.
(Appleton et al., 2005)	1988, 1995, 1999, 2002	3.6-7.5
(Fleisher and Wang, 2005)	1975, 1978, 1984, 1987, 1990	1.37-5.97
(Zhang et al., 2005)	1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001	4.0-10.2

Table C 10 Studies exploring wage returns to education in urban China: Data aspects

Study	Dataset	Wage returns to education
(Knight and Song, 1993)	CHIP 1988	4.5
(Xie and Hannum, 1996)	CHIP 1988	3.1
(Bishop and Chiou, 2004)	CHIP 1988, 1995	2.8-5.6
(Fleisher et al., 2004)	CHIP 1988, 1995, 2002	5.0-7.9
(Guifu and Hamori, 2009)	CHNS 2004, 2006	7.7-8.1
(Liu and Zhang, 2008)	CHNS 1991, 1993, 1997, 2000, 2004, 2006 , 2009	2.46-7.10
(Cui et al., 2013)	RUMiC 2008	3.0-5.0

Table C 11 Studies exploring wage returns to education in urban China: by groups

Study	Individuals	Wage returns to education
(Jamison and Van der Gaag, 1987)	Gender	Male: 4.5; Female: 5.6
(Li, 2003)	Gender	Male: 4.3; Female: 6.9
(Maurer - Fazio and Dinh, 2004)	Gender	Male: 4.5; Female: 2.6
(Qian and Smyth, 2008)	Gender	Male:13.55; Female: 9.27
(Maurer-Fazio, 1999)	Under age 30	Male: 6.4; Female: 6.8
(Qian and Smyth, 2008)	Age 35 and below	17.16
(Li, 2003)	Different time entering the labour market	Before 1979: 4.7 1980-1987: 7.3 1988-1995: 6.5

Table C 12 Studies exploring wage returns to education in urban China: migrant workers

Study	Dataset	Wage returns to education
(Démurger et al., 2009)	CHIP 2002	3.6-7.3
(Maurer - Fazio and Dinh, 2004)	1999-2000 Urban Labour Market Integration Project	1.5-6.4
(Cui et al., 2013)	CHIP 1995 and 2002; RUMiC 2008	3.0-5.0
(Zhao and Qu, 2013)	CHIP 2002; RUMiC 2008	Insignificant to 1.3
(De Brauw and Rozelle, 2007)	Author's own data	8.3
(Sakellariou and Fang, 2016)	RUMiC 2009	4.5-8.5

Table C 13 Studies exploring wage returns to education in urban China: Methodology

Study	Methodology	Wage returns to education
(Li and Luo, 2004)	OLS; IV	OLS: 9.8 IV: 17.7
(Heckman and Li, 2004)	OLS; IV	OLS: 7.3 IV: 14.0
(Guifu and Hamori, 2009)	OLS; IV	OLS: 7.7-8.1 IV: 12.61-14.47
(Knight and Song, 2003)	Quantile Regression (QR)	Wage returns to college or above in 1988: Q (0.125): 17.14 Q (0.375): 14. 20 Q (0.625): 14.71 Q (0.875): 7. 54
(Messinis, 2013)	Quantile Regression (QR)	Wage returns to high education of full time workers: Q(0.10): 21.4 Q(0.25): 19.9 Q(0.50): 23.2 Q(0.75): 19.6 Q(0.90): 21.8
(Cui et al., 2013)	OLS; Quantile Regression (QR)	Wage returns to education of migrant workers in 2008: OLS: 4.0 Q(0.10): 3.0 Q(0.50): 6.0 Q(0.90): 6.0
(Zhu, 2016)	Quantile Regression (QR)	Wage returns to education in 2007: Urban workers: Q (0.10): 3.8 Q (0.50): 5.7 Q (0.90): 5.0 Migrant workers: Q (0.10): 3.1 Q (0.50): 4.4 Q (0.90): 4.9

Table C 14 Studies exploring wage returns to education in rural China

Study	Dataset	Wage returns to education
(Parish et al., 1995)	Chinese General Social Survey (CGSS) 1993	1.8
(Johnson and Chow, 1997)	CHIP 1988	4.02
(Meng, 1996)	Workers Survey Questionnaire 1985	1.1
(Gregory and Meng, 1995)	Data collected by the World Bank and the Institute of Economics of the Chinese Economy of Social Sciences 1986-1987	1.0
(Zhao, 1999)	Household Survey from Sichuan Province 1995	1.2
(De Brauw and Rozelle, 2008)	Author’s own data	6.3-6.5
(Liu and Zhang, 2008)	CHNS 1991, 1993, 1997, 2000, 2004, 2006, 2009	0.97-3.37

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