



[Wang, G.](#) and Wang, Z. (2023) Vocational education: a poor second choice? A comparison of the labour market outcomes of academic and vocational graduates in China. *Oxford Review of Education*, 49(3), pp. 408-427. (doi: [10.1080/03054985.2022.2096583](https://doi.org/10.1080/03054985.2022.2096583))

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<https://doi.org/10.1080/03054985.2022.2096583>

<https://eprints.gla.ac.uk/307010/>

Deposited on 04 October 2023

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**Vocational education: a poor second choice? A comparison of the labour market
outcomes of academic and vocational graduates in China**

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Abstract

In the Reform Era, the Chinese Government has placed great emphasis on the role of education in ensuring the economic success of individuals and of the country as a whole. While vocational and academic post-secondary qualifications are officially set at the same level, vocational education is positioned at the bottom of the educational hierarchy and suffers considerable societal prejudice. Drawing on the most recent nationwide-representative data, we investigate the labour market positioning of graduates from the two types of education in terms of their income, occupation, and level of employment precariousness. The results suggest that: (1) vocational graduates earn less than academic graduates; (2) the type of post-secondary education is significantly correlated with the likelihood of obtaining white-collar high-skilled positions; and (3) vocational graduates face greater precariousness in their jobs than academic graduates do. This study also reveals that the hierarchically stratified post-secondary system may be a source of economic inequality in the Chinese Reform Era. Moreover, it demonstrates that the visible hand of the state seems to further facilitate the reproduction of current forms of inequality that leave an increasing number of graduates in marginalised labour market positions.

Keywords: labour market outcome; academic and vocational post-secondary education; precariousness; China; the Reform Era

Introduction

Since launching sweeping economic reforms in 1978, China has transformed ‘from a closed backwater to an open centre of capitalist dynamism with a sustained growth rate unparalleled in human history’ (Harvey, 2005, p. 1). While scholars disagree about whether or not China has become a neoliberal country (Weber, 2018), it is generally accepted that since the Reform Era began, the market has played an ever more significant role in Chinese society (Mok and Lo, 2007). There has been a redesigning of the official public discourse, which involves concealing, and even condoning, certain forms of suffering and social inequality (Shue and Wong, 2007). Individual choices must be made within an excessively aggressive culture of “competition” (Shue and Wong, 2007; Ong and Zhang, 2008). Young people and their families are now expected to be responsible for their own human capital accumulation in order to compete in the labour market (Woronov, 2015). Drawing on nationwide-representative data, this paper aims to investigate the relationships between credentials and jobs in the Chinese Reform Era and reveal possible sources of economic inequality.

In the Reform Era, the Chinese Government has placed great emphasis on the role of education in ensuring the economic success of individuals and the country as a whole (Ministry of Education, 2010). Participation in post-secondary education has been vastly expanded (Stewart, 2016). More recently, the focus on higher vocational education has been strengthened in order to produce the ‘skill-oriented talents’ desperately needed by the country’s economy² (State Council, 2017). The Higher Education Act of 1998 emphasises that vocational colleges (vocational route) and universities (academic route) should be offering two different *types* of higher education: vocational and academic degrees; however, whilst these qualifications are officially set at the same level (Ding, 2004), this does not mean there is parity of esteem between them. Rather, vocational education, like in other countries (Di Stasio et al., 2016; Wheelahan and Moodie, 2017), is treated as an inferior form of higher education, a poor second choice (Yang, 2004; Ling, 2015; Yi et al., 2018). This paper examines whether vocational post-secondary education and academic post-secondary education enjoy equal standing in China from the perspective of the labour market outcomes of their respective graduates.

A large number of empirical studies in various countries have found evidence that post-secondary education provides advantages over lower levels of education in terms of returns on education (Psacharopoulos, 1994; Hu 2013; Furlong et al., 2018). Recent research comparing the labour market outcomes of different types of post-secondary education have focused on the context of German-speaking countries (Lauer and Steiner, 2001; Weber, 2003; Riphahn et al., 2010; Beckes-Gellner and Geel, 2014). These are countries where higher average wages and lower financial risks have been observed for vocational graduates **than that of academic graduates** (Beckes-Gellner and Geel, 2014). In China, however, where the involvement of the state and of employers is relatively low, skill formation is mainly provided through the education system; hence, post-secondary education is particularly relevant when it comes to economic returns in the labour market (Hu and Vargas, 2015, p. 339). Hu and Vargas (2015) find there is a horizontal stratification within the academic route, as graduates’ incomes are affected by college ranking, location, and major. Ding (2004) concludes that vocational education graduates are increasingly losing their competitiveness in the labour market as the higher education sector expands. These studies, however, do not compare the respective labour

² It is argued that China is facing a potential growth of technological unemployment and job polarisation in the age of the Fourth Industrial Revolution (4th IR) (Li et al. 2017). In 2017, the 19th National Congress of China acknowledged the consequences of the 4th IR and pointed out the need to ‘promote the deep integration of AI and economy’ and ‘cultivate a large number of internationally competitive talents’ (State Council 2017).

market positions of graduates from these two types of education, and neglect the different levels of job precariousness that may be associated with these two pathways.

In our paper, we close this gap by exploring the labour market outcomes of the students taking post-secondary vocational and academic routes, in terms of their incomes, occupations, and employment precariousness. We make contributions to the existing literature by comparing the labour market outcomes of these two post-secondary pathways during the Chinese Reform Era, at a time when the society has undergone rapid transition. The period has seen the extensive expansion of post-secondary education as well as a comprehensive transformation to an open labour market. Against this background, this paper aims to contribute to our understanding of possible sources of economic inequality in China and to shed light on the level of precariousness young people may experience in their working lives. Moreover, our research intends to provide a unique perspective for examining the unequal standing of academic and vocational education in the Chinese Reform Era.

We proceed with discussions of the Chinese Reform Era and the changes it has brought to the post-secondary system. We then provide the theoretical basis and hypotheses on which this research is founded. After presenting the data, measures, and methodology, we report the major findings and discuss their implications for future work.

The Reform Era

Scholars have argued that China has embraced neoliberalism since the start of the Reform Era, coinciding with similar changes in other parts of the world (Ferguson and Gupta, 2002; Gledhill, 2004; Harvey, 2005; Sharma and Gupta, 2006). Reforms in housing (Lee and Zhu, 2006), health care (Lu and Wei, 2010), and education (Mok and Lo, 2007) all seem to follow neoliberal principles. However, many argue that the authoritarian control exercised by the ruling Communist Party over economic development and governance contradicts the neoliberal template (Ong, 2007; Nonini, 2008). Analysing the historical accounts of China's political and economic problems in the late 1970s, Weber argues that while neoliberalism was used as a way out of the crisis, the country has never fully embraced the neoliberal path, and it has remained a mixed economy with a consciously and actively visible hand of the state shaping economic development (Weber, 2018, p. 229). In spite of the above-mentioned differences among scholars regarding whether or not China has become neoliberal, many of them agree that China

has become one of the most unequal societies during its rapid economic growth since the Reform Era (Hart-Landsberg and Burkett, 2005; Harvey, 2005; So, 2005; Nonini, 2008).

Before the start of the Reform Era, skills training was provided by large work units (*danwei*), the major form of urban employment during the times of the planned economy (Thøgersen, 1990). In the planned economy, graduates of *danwei*-affiliated schools were automatically assigned to lifelong jobs in their units; this was known as the “iron rice bowl”³ system since the workers’ livelihoods were guaranteed over the course of their lifetimes (Unger, 1982; Thøgersen, 1990). However, at the end of the 1980s, China’s leadership introduced market mechanisms for job allocation after graduation. It removed students from the *danwei* system, forcing them to seek jobs in the newly created open labour market (Lewin and Xu, 1989). The “iron rice bowl” jobs have been replaced by *bianzhi*,⁴ which consists of a limited number of public sector jobs. Driven by a neoliberal view of human capital, the Chinese Government envisioned education as a motor of economic growth and has implemented a series of reforms to expand post-secondary education since the late 1990s (Thøgersen, 1990, 2002). Education took on greater value as the country developed a market economy (Maurer-Fazio, 2006). As a result of both the open labour market and the expansion of higher education, ‘educational desires’ (Kipnis, 2011) in China were transformed, which greatly intensified the pressure on students to gain higher educational credentials.

The Chinese post-secondary system

In the Reform Era, the Chinese Government has adopted the belief that the further expansion of post-secondary education is essential to economic success, and the arrival of a knowledge-driven economy requires a universal upskilling of the labour market (Ministry of Education, 2010). In 1993, China’s milestone policy paper *Outline for Educational Reform and Development* set education expansion as a goal for the 1990s (Ministry of Education 2010). By sending out a clear message that higher educational credentials will generate higher future income (Bai, 2006; Zhang, 2008), the Chinese Government was driving families to invest in education (Kipnis, 2011). However, the massification of post-secondary education has resulted

³ “Iron rice bowl” is a term used to refer to the job assignment system that comes with the lifetime guarantee of steady salaries and the benefits of a socialist welfare package (Hoffman, 2006, p. 551).

⁴ *Bianzhi* is the authorised number of personnel (the number of established posts) in a party or government administrative organ (*jiguan*), a service organisation (*shiye danwei*) or a working unit (*qiye*) (Brødsgaard 2002). By controlling *Bianzhi*, the state could exercise control over the entire administrative apparatus from central to local levels. The benefit of having a *bianzhi* is that employees could enjoy the “iron rice bowl” lifelong job security, and salaries and welfares are allocated by the government.

in graduate unemployment and underemployment (Mok and Wu, 2015; Mok et al., 2021). With contracts viewed as an indicator of a quality job in China, it is noteworthy that only 38% of graduates in 2013 were issued contracts (Mok and Wu, 2015). Researchers have repeatedly found a decline in graduate premium and a mismatch of graduate skills with the changing labour market needs in China (Hansen and Woronov, 2013; Hu, 2013; Mok et al., 2021). Existing literature shows the emptiness of the “promise” that investment in post-secondary education guarantees social mobility (Brown, Lauder and Ashton, 2010).

The current structure of China’s post-secondary education has evolved into a hierarchical system (Liu, 2013; Liu and Wang, 2015): national universities remain at the top, ambitiously focused on attaining “world-class” status and promoting national competitiveness. Provincial and local institutions (*erben*) lie in the middle tier, serving as the major providers of higher education; vocational colleges are largely at the bottom, focusing on vocationally oriented programmes (Liu and Wang, 2015). Access to any form of post-secondary education in China is mainly determined by the National College Entrance Examination (CEE or *gaokao*), which is a high-stakes, academically orientated exam. After completing their secondary education (generally at the age of 18), students have the option of taking the CEE and applying for post-secondary education (Liu, 2013). The top-tier research universities are able to recruit the students with the highest exam scores. At the bottom of this educational “caste” system lie the vocational institutions, which accept the “left-over” students (Zha, 2012).

Chinese vocational colleges generally offer three-year vocational degrees, while universities offer four-year academic degrees (Hansen and Woronov, 2013). While the Higher Education Act of 1998 states that academic and vocational qualifications are at the same level, vocational education is still treated as an inferior form of higher education, a non-formal version of higher education, and a kind of higher education reserved for low-scoring students (Yang, 2004; Ling, 2015). Students who enrol in vocational colleges tend to be those who have fared poorly in the CEE (Mok 2001; Li 2004; Yang 2004; Zha 2012; Liu and Wang, 2015), and are therefore considered “failures” and “stupid and lazy” youth by Chinese society, deserving only of limited occupational opportunities (Woronov, 2015). When investigating the unequal standing of vocational and academic post-secondary pathways, some researchers have suggested that Chinese vocational studies are mostly chosen by default or as a last resort – a fallback for those who fail to gain places at universities – rather than out of personal or family interest (Zhang, 2008; Hansen and Woronov, 2013; Luo, 2013; Klorer and Stepan, 2015; Woronov, 2015).

With the *danwei*-affiliated vocational schools becoming obsolete, in the Reform Era, employers, especially organisations in the state-owned sector (Li, 2005), have tended to use internal training as the main mode of training delivery (Chen et al., 2009). In-house mentoring has been adopted by most firms as a means of formal skill development (Cooke, 2012), replacing the dominant compulsory apprenticeships of the Socialist Era (Li and Sheldon, 2010). Many employers have chosen not to invest in the VET (Vocational Education and Training) system as they believe it to produce poor-quality graduates, deficient in technical skills and work experience (Li and Sheldon, 2010).

Educational credentials are used as a tool to distinguish between job applicants in an increasingly competitive market (Hansen and Woronov, 2013). Employers believe that if their staff hold the preferred type of educational credentials (i.e. academic degrees), this may ‘signal’ better ‘trainability’ or ‘learning potential’ (Thurow, 1975). Therefore, the comparative advantages of vocational college graduates in the labour market are not apparent, and they are easily outcompeted by university graduates (Ding, 2004; Zhang, 2008).

In recent years, to improve the standing of vocational education, the Chinese Government has put forward a series of strategies to better align vocational education with the needs of industry and build stronger vocational pathways from school to work⁵. In 2019, the Chinese State Council published the *Implementation Plan on National Vocational Education Reform*, which announced that 100 billion RMB would be invested in VET to enable 15 million people to upgrade their skills (State Council, 2019). In this paper, we aim to find out how vocational and academic graduates may differ from each other in their labour market outcomes, and investigate whether parity of esteem has been achieved in the Chinese post-secondary system.

Theoretical background and hypotheses

One possible explanation of the relationship between education and the labour market is provided by human capital theory. The decision to spend time on education has strong

⁵ At the end of 2017, the State Council published its *Plans on Deepening the Integration of Industry and Vocational Education* (State Council, 2017). In 2018, the Ministry of Education, the Ministry of Industry and Information Technology, and four other major governmental departments were asked by the State Council to enact *The Guidelines on Promoting the Cooperation of Vocational School and Enterprise*, with the aim of making industry and business the driver of vocational education and improving students’ skills and capacities (State Council, 2018). The published *Plans* and the *Guidelines* aimed to develop a highly skilled workforce by establishing an industry-driven VET sector.

similarities with an enterprise's decision to invest in physical capital, as it involves an individual investing in education to acquire human capital, which will in turn increase their productivity in employment and enable higher future earnings (Becker, 1964). Within the Chinese post-secondary educational hierarchy, the vocational route is perceived as a lower quality form of human capital accumulation than the academic route (Woronov, 2015). Therefore, we hypothesise:

H1: On average, individuals on the vocational route will receive a lower level of income on the labour market compared to graduates on the academic route.

China's skill formation system is characterised by low levels of public commitment and firm involvement (Hu and Vargas, 2015). Skills development has become too far removed from skills deployment (Allais, 2012). Individuals are required to compose their own qualification profiles, according to what they think will improve their position in the labour market (Brockmann, 2011). The breakdown of the "iron rice bowl" system and the major shift in the mode of skill formation have entrenched the belief in people that taking blue-collar jobs (e.g., being a manual worker or technician) offers no job security and a lower social status in China's market economy (Zhang, 2008). Less labour-intensive, white-collar jobs are preferred by students and their families (Ling, 2015). Although vocational and academic qualifications are officially recognised as being at the same level, vocational graduates have in fact found themselves at the bottom of the stratified post-secondary education system, which may lead to them migrating downwards through the perceived occupational hierarchy in the Reform Era. Therefore, we hypothesise:

H2: On average, graduates of the academic route are more likely to obtain white-collar, high-skilled jobs on the labour market compared to those graduating from the vocational route.

The informal economy and informal employment have expanded dramatically as a result of the Reform (Swider, 2017). Analysing this transformation in China, Standing (2017) argues that it is important to end the use of the term "informal", which draws a dualism with "the formal economy". Standing proposes instead the use of the terms "precarity" or "precarious work" as a better means of understanding labour insecurity (Standing, 2011), as they capture the varied categories of nonstandard work (Swider, 2017). Investigating the working lives of young people in the UK, Furlong et al. (2018) point out that precarious working is the new "normality" for young people under global capitalism. The "gold standard" of full-time paid employment has been replaced with a variety of "alternative" forms of employment that are precarious,

temporary, and so forth (Furlong et al., 2018, p. 16). Similar to the situation in the UK, a growing part of “the precariat” in China consists of educated young people who ‘scurry between short-term income-earning activities and who rely on friends and relatives to survive’ (Standing, 2017, p. 169). They have been described as a “tribe of ants”, a reference to those living marginalised lives in crowded conditions (like ants) in urban villages (Wang et al., 2017). Since vocational degrees are considered “less preferred” qualifications compared to academic degrees, vocational graduates may face more precariousness than those taking the academic route. Therefore, we hypothesise:

H3: On average, graduates of the vocational route are more likely to find themselves in precarious work compared to those graduating from the academic route.

Data and methodology

Data

In this research, we used the sample of graduates from post-secondary education (including academic and vocational) derived from the 2018 Chinese Family Panel Studies (CFPS). Launched in 2010, the CFPS is a nationally representative, biennial longitudinal survey of Chinese communities, families, and individuals. It applies a multi-stage stratified sampling strategy and covers 25 provinces/autonomous regions (excluding Hong Kong, Macao, Taiwan, Xinjiang, Tibet, Qinghai, Inner Mongolia, Ningxia, and Hainan). The 2018 CFPS is the most recent nationally representative survey in China and provides detailed information about respondents’ type of education, income, and occupation, along with many other socio-demographic variables. In this study, we restrict cases to individuals who started their post-secondary education after 1977⁶ and completed their degrees before 2018. The study sample is further restricted to include only individuals with valid inputs regarding type of post-secondary education, income, gender, ethnicity, urbanicity, family socioeconomic status, and occupation. Applying these criteria reduced the sample size to 2,599 individuals. Table 1 describes the variables used in this study.

Insert Table 1 here

The target population of this study is not the general Chinese population, but the population of graduates who started post-secondary education after 1977 and completed their degrees before

⁶ The National College Entrance Exam (CEE) was restored in 1977 after a gap of more than a decade, during which time the country experienced the chaos of the Cultural Revolution.

2018. According to Maxwell (2000) and Knofczynski and Mundfrom (2007), the sample size of 504 individuals is sufficiently large to guarantee at least 80% statistical power. The number of graduates who completed post-secondary degrees in this time range is approximately 7.2 million (National Bureau of Statistics of China, 2014). In the CFPS dataset (2018), 16.62% of the 18,380 respondents have post-secondary degrees, which is fairly close to 15.47%, the percentage of individuals with post-secondary degrees in the Population Census Report (2020). Therefore, the sample used in our research shows relatively strong representativeness.

Measures

In this article, we analyse three dependent variables to capture the labour market outcomes of post-secondary education graduates. The first dependent variable is *income*, which is measured by the log-transformed value of total annual income in 2017. *Occupation*, our second dependent variable, is of particular interest to us given it involves the level of skills that an individual performs in the workplace. We follow Hessels et al.'s (2017) taxonomy and further distinguish between different occupations along two lines: collar type and skill level (see Table 11 in the Appendix). The distinction between white-collar and blue-collar workers is based on the ISCO-88 (International Standard Classification of Occupations), where ISCO-88 major occupational groups 1-5 are defined as white-collar labour and ISCO-88 major occupational groups 6-9 are designated as blue-collar labour. High-skilled occupations fall into ISCO-88 categories 1, 2, 3, 6, and 7, while low-skilled jobs fall into categories 4, 5, 8, and 9 (Hessels et al., 2017, p. 736). Based on this taxonomy, four occupational groups were constructed: white-collar and high-skilled (code 0), white-collar and low-skilled (code 1), blue-collar and high-skilled (code 2), and blue-collar and low skilled (code 3).

To measure the level of precariousness faced by these graduates, we adopted the “zones of (in)security” model framed by Furlong et al. (2018), with a minor revision. Furlong et al. (2018) developed the three zones of (in)security to understand the emerging features of the youth labour market in the UK, which can be termed “the marginalised zone”, “the liminal zone”, and “the traditional zone”. Those in the marginalised zone are those facing the highest level of precariousness, including the unemployed, the workless, and the “fill-in” workers, as well as those on government training schemes. The liminal zone includes those on part-time contracts (less than 10 hours per week), individuals with temporary/insecure full-time work, and the self-employed. The traditional zone features the lowest level of precariousness, and includes those in permanent/secure full-time work (Furlong et al., 2018, p. 49). We make a minor revision to

this categorisation, in an attempt to make it more applicable to the Chinese context and the 2018 CFPS dataset (see Table 2). We include the unemployed and dispatched workers⁷ in the marginalised zone, employed workers on fixed-term contracts in the liminal zone, and permanent/secure full-time (*bianzhi*) workers⁸ in the traditional zone.

Insert Table 2 here

In addition to the main variables of interest, our analysis includes a set of control variables denoting certain demographics and socio-economic characteristics that may confound the relationship between education type and labour market outcomes. As described in Table 1, these characteristics consist of gender, age, ethnicity, party membership, household registration status, location, and parents' educational level. Furthermore, we added cognitive level to our analysis. An individual's cognitive level is measured by employing the literacy and numeracy tests of the CFPS; we used factor analysis to link these two test results to one variable so as to represent general cognitive performance.

Research methodology

To estimate the economic returns of graduates of these two different types of post-secondary education, a Mincerian earnings equation was utilised (Mincer, 1974). It can be written as Eq. (1) below:

$$\ln(\text{income}) = \alpha + \beta_1 \times \text{edu} + \beta_2 \text{age} + \beta_3 \text{age}^2 + \beta_4 Z + \varepsilon \quad (1)$$

where *income* represents an individual's annual total income in 2017, *edu* stands for a graduate's degree, *age* and *age*² denote the respondents' age and the square of their age, respectively, *Z* represents a series of control variables, and ε is the residual.

We used the Multinomial Logit Model to analyse the influence of the two types of education on the graduates' occupation status and the level of their employment precariousness. The Multinomial Logit Model calculates the coefficient using the Maximum Likelihood Estimation (MLE). The model can be represented by Eq. (2) below:

$$\text{logit}(P) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p \quad (2)$$

⁷ Dispatch work is a common form of precarious work emerging in the Reform Era. It involves shorter contracts and diminished worker power, as the legal employer of dispatched workers is an employment agency, rather than the company where they work (Swider, 2017).

⁸ Permanent/secure full-time jobs are equivalent to the "iron rice bowl" jobs of the Socialist Era. They usually involve holding a *bianzhi*. As mentioned in the previous section, a *bianzhi* is a guarantee from the state of a worker's livelihood over the course of their lifetime (Brødsgaard, 2002).

where P is the event rate relative to the base category, β_0 is the constant term, β_p is the partial regression coefficient of the variable x_p . If we add the key independent variable and control variables into the model, we get Eq. (3) and Eq. (4):

$$Occupation_i = \beta_0 + \beta_1 \times edu + \beta_2 Z + \varepsilon \quad (3)$$

$$Precariousness_i = \beta_0 + \beta_1 \times edu + \beta_2 Z + \varepsilon \quad (4)$$

where Z represents a series of control variables, and ε is the residual, which is similar to Eq. (1). For Eq. (3) and Eq. (4), the base value of the independent variable is set to 0.

Results

Descriptive findings

Table 3 and Table 4 present the descriptive findings of the study. The average annual income of all the graduates who obtained post-secondary degrees is 50,733.80 yuan, which is nearly 1.8 times the average income (28,228.05 yuan) of the Chinese residents in the sample. However, the vocational graduates earned 30% less than their academic counterparts did in 2017. In terms of their occupation status, more than 87% of the graduates had obtained white-collar jobs, with 64% of them in high-skilled work. While almost seven in ten academic graduates were in white-collar and high-skilled jobs, there were 20% fewer vocational graduates in this category. In terms of the level of job precariousness, two in five academic graduates were in the traditional zone (permanent work), while only one in five vocational graduates had secured a permanent position.

Insert Table 3 here

Insert Table 4 here

Income

Table 5 presents the OLS results concerning the relationship between different types of post-secondary education (academic/vocational) and income. The results of Model 1 suggest that vocational graduates earned lower incomes than graduates with academic degrees, lending support to H1. After controlling socio-economic and family variables, the results remained valid. Then, we added the other two main variables into the model through stepwise regression. As can be seen in Model 2, there is almost no significance in terms of income across different occupations. Interestingly, Model 3 indicates that the more secure the jobs the graduates had obtained, the higher the income they were likely to earn.

Insert Table 5 here

Occupation

Table 6 presents the results relating to the effect of different types of education on the graduates' occupations. In terms of collar type, the findings of our analysis indicate that vocational graduates were more likely to be in blue-collar work compared to their academic counterparts. As for the level of skills involved in their work, the likelihood of the vocational graduates being in low-skilled work was significantly higher than for the academic graduates. Thus, Hypothesis 2 is supported.

Insert Table 6 here

Precariousness

Table 7 shows the results regarding the relationship between different types of post-secondary education and the level of employment precariousness. Our analysis findings indicate that vocational education decreases the likelihood of graduates being in either the liminal zone or the traditional zone. However, the impact of vocational education on the likelihood of graduates being in the traditional zone is the more significant. In other words, vocational education is found to be less likely than academic education to lead to graduates gaining permanent/secure work in the traditional zone. Vocational graduates encountered a higher level of job precariousness than the academic graduates did. This result supports H3.

Insert Table 7 here

Robustness checks

The above logistic regression models were applied to examine the effects of education on the graduates' income, occupation, and job precariousness. But these effects are conditional on a series of confounding variables. In order to control for and eliminate any selection bias these confounding variables may bring, Rosenbaum and Rubin (1983) proposed to find the causal relationship between variables via propensity score matching (PSM).

In this research, the confounding variables include *gender, age, age square, ethnicity, party membership, hukou, region, cognitive level score, sum of parent's education, and difference of parent's education*. We adopted Rosenbaum and Rubin's (1983) approach to test the results for robustness. Specifically, in the first stage, we used the linear probability model (LPM) to re-estimate the effects of education on the graduates' occupation and job precariousness. The results are consistent with what we found when applying the logit model (Table 4 and Table 5). Secondly, after performing a balance test on the sample, the results showed that the standard error (SE) of most variables after matching was less than 5%, which met the requirements of the propensity score matching approach. Thirdly, we used five matching methods, including one-to-one matching, radius matching, nearest-neighbour matching within caliper, kernel matching, and mahal matching, to calculate the average treatment effect for the treated (ATT). The results shown in Table 8, Table 9, and Table 10 illustrate that the ATTs estimated using different matching methods are consistent with the linear model estimation results, indicating that the research results in this paper are robust.

Insert Table 8 here

Insert Table 9 here

Insert Table 10 here

Conclusion and discussion

Drawing on nationally representative data collected in China, we compared the labour market outcomes of two different types of education (academic and vocational), in terms of the graduates' income, occupation, and employment precariousness. This generated several noteworthy findings.

Firstly, post-secondary educational type leads to differences in graduates' income in China, with academic graduates enjoying significant economic advantages. This **is different from** the empirical results in Switzerland, which indicated higher wages for vocational tertiary education graduates compared to academic graduates (Backes-Gellner and Geel, 2014). Secondly, the type of post-secondary education is significantly correlated with the likelihood of obtaining a white-collar high-skilled position, implying that the type of post-secondary degree may function as an effective proxy of education quality in the eyes of employers in China, supporting Woronov (2015) and Ling's (2015) theoretical reflections. It seems that under the influence of neoliberal human capital thinking, the relationship between credentials and jobs in the Chinese Reform Era is managed through a "stockpiling approach", which focuses on the labels (the qualification) on the box, while ignoring what is actually in the box and what uses its contents might actually be put to (Keep and Mayhew, 2004). Employers may see post-secondary education as a signal; they might choose to hire those who have followed the academic route ahead of those following the vocational route because they regard the former as a marker of greater productivity and learning potential (Thurow, 1975). Finally, the findings of this study also show that the jobs of vocational education graduates involved a higher level of precariousness compared to the jobs obtained by academic graduates. While previous studies indicate that vocational qualifications might improve students' employment chances (McIntosh, 2004; Guo and Wang, 2020), they neglect to examine what kind of jobs vocational qualifications may lead to and the level of risk they may involve, especially in a labour market lacking an institutional foundation for aligning education (skill development) with the workplace (skill deployment) (Allais, 2012; Di Stasio et al., 2016; Wheelahan and Moodie, 2017). As Ding (2004) points out, the comparative advantage of vocational graduates is not apparent and they are easily outcompeted by academic graduates. But this study goes further by demonstrating the marginalised position faced by higher vocational education students in terms of their income, occupation, and job precariousness. This indicates that the inequality

associated with different types of education persists when graduates enter the labour market. This study reveals that, under the influence of neoliberalism, the hierarchically stratified post-secondary system may be a source of economic inequality in the Chinese Reform Era.

The Chinese Government has been strengthening its focus on VET over the past few years in order to produce the ‘skill-oriented talents’ desperately needed by the country’s economy (State Council, 2017). However, VET graduates, who are expected to be key members of China’s ‘upskilled workforce’ (State Council 2017), have found themselves in a marginalised labour market position and experienced a higher level of job precariousness after graduation than other graduates. This finding contrasts with the Government’s intention of building a strong vocational education system for the country (State Council, 2017). It is possible that a further expansion of the higher vocational education sector⁹ may result in an increasing number of young people finding themselves in marginalised labour market positions. The tertiary education system may turn into a source of wage inequality and labour market dualism. The findings of this article also indicate that the level of job security is correlated with graduates’ income level. Although previous studies have demonstrated the important role played by the market in the Chinese Reform Era (Lee and Zhu, 2006; Mok and Lo, 2007; Lu and Wei, 2010), the permanent/secure full-time employment positions with *bianzhi* (in the traditional zone), which appear to be more lucrative, remain firmly under state control. It is evident that post-secondary education type is used as a marker of prestige by state-controlled employers. The inferior status of higher vocational education may be enabled and sustained by a labour market which is heavily influenced by the state. In the Reform Era, the privatisation of responsibility—accumulating one’s own human capital and creating one’s own “rice bowl”—disguised as freedom, often puts the individual in a position of uncertainty or ambivalence (Bauman, 2007). This is similar to the observation made by Furlong and Cartmel (1997) and Furlong et al. (2018) that, in neoliberal countries, the heightened sense of precarity experienced by young people in the labour market has been sustained by the state. The visible hand of the state seems to further facilitate the reproduction of current forms of inequality, which will continue apace and become further embedded under the influence of neoliberalism (Bauman, 2007).

⁹ In 2019, the Chinese State Council published the *Implementation Plan on National Vocational Education Reform*, which announced that 100 billion RMB was to be invested in vocational education to enable 15 million people to upgrade their skills (State Council, 2019).

Admittedly, our research has a number of limitations. The relatively small sample of graduates with post-secondary education in the CFPS 2018 limits our ability to examine other dimensions of the graduates' labour market outcomes. Moreover, due to our limited dataset, some unobservable variables may still exist, which may lead to biases in the causal inferences. Future studies could explore the regional heterogeneity of China's labour market. Still, even bearing in mind the aforementioned limitations, this research advances the knowledge about the labour market outcomes of post-secondary students in China. This study provides preliminary evidence that a form of economic inequality in the Chinese Reform Era, generated by a hierarchically stratified post-secondary system, is enabled and sustained by a labour market which is heavily influenced by the state.

Appendix

Insert Table 11 here

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