

***Does the Market Pay Off?
Earnings Inequality and Returns to Education in Urban China***

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Abstract

The paper examines earnings inequality and earnings returns to education in China among four types of workers characterized by their labor market history. Compared to workers staying in the state sector, early market entrants no longer enjoyed advantages. The commonly observed higher earnings returns to education in the market sector are only limited to recent market entrants. This results from the aggregation of two very different types of workers: those who were “pushed” and those who “jumped” into the market in later stage of the reform. The findings challenge the prevailing wisdom that education is necessarily more highly rewarded by the market sector.

Key words: Labor Market, Earnings, Education, China’s Transition

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Non-Technical Summary

Previous work on the market transition debate in sociology has missed the direct link between *individuals'* labor market histories and *individuals'* labor market outcomes. In this paper we develop a typology of workers based on their labor market histories: the first type refers to those who were in the state sector initially and have continued to stay there (“stayers”). The second type (“later entrants”) describes those who began in the state sector but later transferred to the market sector. The third type (“market losers”) includes those who initially were in the market sector but later retreated to the state sector. The last type (“early birds”) consists of those who entered the market early and have stayed there. We proposed a model of selective transition of workers from the state sector to the market sector, and derived several hypotheses in regard to earnings inequality and earnings returns to education among these four types of workers.

Our empirical analyses are based on the survey of “Life Histories and Social Change in Contemporary China” (1996), a multi-stage stratified national probability sample of 6,090 adults aged 20-69 from all regions of China (except Tibet). We use the urban half of the sample to investigate the process of labor market transitions in the period between 1987 and 1996. We selected 1987 as the benchmark year because the urban economic reform was initiated in 1986. Prior to 1986, private economy and urban labor markets were almost nonexistent, and few workers had transferred from the state to the market sectors.

Although our results confirm the prevailing wisdom that returns to education are higher in the market sector than in the state sector, no differences, in either earnings or returns to education in 1996, have been found between early birds in the market sector and stayers in the state sector. Instead, the observed differences are limited to later market entrants. These findings run counter to the claim that market mechanisms *per se* lead to high returns to human capital and

indicate the need a better understanding of the dynamic processes of social actors during market transition. Workers entering the market sector in the initial stage of the urban economic reform no longer enjoyed advantages in either earnings or returns to education in 1996. The major winners in the market transition are later market entrants.

Further analysis provides an alternative explanation for the higher returns to education for later market entrants. After disaggregating the two types of later entrants -- those who were “pushed” and those who “jumped” into the market sector -- and correcting selection biases, we find no significant difference in returns to education among voluntary entrants, involuntary entrants, and workers staying in the state sector. We conclude that higher returns to education in the market sector of a transition economy cannot be construed as caused by marketization *per se*, and that the sorting process of workers in labor markets helps explain the results.

Our findings suggest that researchers should reconsider the implications drawn from sectoral comparisons in addressing the social consequences of market transition in China. While the argument that the institutional structure of an economy is important in determining social stratification outcomes is undisputed, sectoral distinctions do not necessarily lead to the difference in economic returns to education. Vice versa, without critically examining the labor market conditions, imputing the institutional significance from the sectoral differences in returns to education is unwarranted. Furthermore, researchers should also be cautious when interpreting the temporal trend of returns to education in the reform era. The increase in the role of education as an earnings determinant could result from the changing sectoral composition of the economy and workers’ increasing mobility into the market sector over time, rather than marketization *per se*.

Does the Market Pay Off?

Earnings Inequality and Returns to Education in Urban China

The relationship between earnings and education in market economies is well known: human capital theory explains that a large gradation in earnings by education reflects returns to individuals' investment in education (Becker 1993; Mincer 1974). Thus, low earnings returns to education in redistributive economies, observed for pre-reform China, may be attributed to the absence of markets (e.g., Peng 1992; Walder 1990; Whyte and Parish 1984; Xie and Hannum 1996; Zhao and Zhou 2001). Scholars of state socialism have long observed that economic resources were allocated primarily according to bureaucratic principles under redistributive economies, in which political loyalty rather than economic productivity was the basis of reward (Polanyi 1957; Szelenyi 1978, 1983). One of the principal structural changes following the post-socialist transformation has been the gradual replacement of the market as the principal agent of social stratification. This notable change has led some theorists to predict an increase in the importance of market credentials (such as education) and a decrease in the importance of political factors as determinants of earnings in transition economies (Cao and Nee 2000; Nee 1989, 1991, 1996; Nee and Matthews 1996). This assertion on market transition has contributed to a lively debate among sociologists studying institutional transformation and social stratification in former state socialist societies (Bian and Logan 1996; Gerber and Hout 1998; Oberschall 1996; Parish and Michelson 1996; Rona-Tas 1994; Szelenyi and Kostello 1996; Walder 1996; Xie and Hannum 1996; Zhou 2000a).

Controversies are mainly focused on whether the importance of redistributive power has declined in the post-socialist era. Several competing theses, such as "power persistence" (Bian

and Logan 1996; Nee 1991) and “power conversion” (Rona-Tas 1994; Hankiss 1990; Staniszkis 1991), have been proposed to account for advantages held by cadres and party members in transition economies (also see Gerber 2000, 2001; Lin 1995; Oi 1992; Rona-Tas and Guseva 2001; Walder 1996). Empirical studies on urban China have reported an upward trend in income/earnings returns to human capital, particularly to education (Bian and Logan 1996; Hauser and Xie 2001; Zhou 2000a), while cross-sectional studies have found higher returns to education in the market sector than in the state sector (Knight and Song 1993; Tang and Parish 2000; Wu 2002a; Zhao and Zhou 2001). Thus, the evidence appears to support the claim that “the transition to a market-like economy should result in higher return to human capital characteristics.”(Nee 1989: 674).

The prevailing wisdom is to attribute (either wittingly or unwittingly) the increasing returns to education to market transitions, even among those who do not accept “the-declining-influence-of-redistribution” thesis. For example, Bian and Logan (1996:755) assert: “we found clear signs of the impacts of market transition...Education, correspondingly, has become more important as a predictor of income.” Similarly, Zhou (2000a: 1166-67) argues that, because the role of education reflects the distinctive institutional logic in different economies, “increasing returns to education may be partly attributed to emerging labor markets that better realize values of human capital than before...Increasing returns to education in the reform era clearly reflect the increasing importance of human capital in market transitions.” This apparent agreement has led Nee and his associate (Cao and Nee 2000) to claim that the emergence of market institutions has caused “higher returns to human capital than under a centrally planned economy.”

Yet, the same empirical observations may be subject to alternative interpretations. Education, be it the proxy of human capital or credentials, was also highly rewarded under the

socialist stratification system (Konrad and Szelenyi 1979; Szelenyi 1988; Walder 1995; Walder, Li and Treiman 2000; Wu 2001). Zhou (2000b: 1192), in the rejoinder to Cao and Nee (2000), contends that high returns to education could be an outcome of interplay between redistribution and markets. Noting the government's emphasis on human capital in wage policies in the early 1980s, Zhou (2000b: 1193) speculates that increasing returns to human capital (education) in reform-era China's may reflect "the compound effects of political processes and marketization." Without a substantive understanding of how human capital is allocated in the specific institutional context, high returns to human capital cannot be interpreted as caused by market mechanisms.

We use Zhou's remark as our starting point to move beyond the debate framed by Nee's market transition theory. In this paper, by incorporating *individuals'* labor market histories in examining earnings inequality and earnings returns to education among *individual* workers in transition China, we aim to offer a micro perspective on how the sorting process of workers into labor markets shapes labor market outcomes (i.e., earnings). Rather than attributing higher returns to education in the market sector than in the state sector as resulting from more efficiently operated market mechanisms *per se*, we propose a model of selective mobility of workers from the state sector to the market sector as an alternative explanation.

Earnings Inequality and Returns to Education in China's Transition Economy

China started its economic reforms in 1978, initially in rural areas, and beginning in 1986, expanded it to urban areas. The past two decades have witnessed rapid economic growth and enormous social changes in the most populous nation in the world. From 1978 to 1996 China's GDP has almost quadrupled, with a nearly 10 percent annual growth rate. The greatest

beneficiaries of the growth and prosperity are Chinese people, whose living standards have improved significantly. The per capita living space has more than doubled in urban areas, and total household bank deposits, measured against the GDP, increased from less than 6 percent in 1978 to more than 60 percent in 1996 (Qian 1999; SSB 1997).

However, not all Chinese have equally benefited from the economic reform. This phenomenal growth in prosperity, accompanied as it was by the dismantling of traditional socialist welfare and security systems, has resulted in rising inequalities in income (e.g., Griffin and Zhao 1993; Hauser and Xie 2001 ; Zhao and Zhou 2001). From 1988 to 1995, for example, the Gini coefficient, a measure of income inequality, increased from 0.233 to 0.322 in urban China, and from 0.338 to 0.416 in rural China (see summary in Hauser and Xie [2001]). The image of egalitarian Chinese socialism is no longer the reality.

A large body of literature, mostly in economics, addresses the trend of income inequalities in China since 1978 (Adelman and Sunding 1987; Byron and Manaloto 1990; Griffin and Zhao 1993; Hsiung and Putterman 1989; Khan et. al. 1992; Khan and Riskin 1998; Knight and Song 1993; Zhao 1993). Sociologists, however, have been more interested in the relocations of people in the changing social structure -- that is, who wins and who loses during the transition. In the reform era, researchers have continued to observe positive returns to both political capital (such as party membership) and human capital (such as education) (Bian and Logan 1996; Walder 1990; Xie and Hannum 1996), and the role of both factors seems to have increased over time (Hauser and Xie 2001; Zhou 2000a; see summary in Zhao and Zhou 2001: Table 2).

To what extent are these observations attributable to marketization *per se*? The studies have been inconclusive so far. For instance, income distribution has experienced a U-shape

trajectory in all former state socialism countries: income inequality declined in the early reform era but increased later. Although some scholars argued that the emergence of market economies brought about the decline (Nee 1989; Szelenyi 1978, 1983),¹ variations in income inequality could instead result from the state egalitarian policy designed to win support of the working class for the reform (Bian and Logan 1996:755). Increasing returns to education within the public sector (Zhou 2000a), which has been immune to marketization until recently, can hardly be attributed to marketization.

The difficulty lies in the operationalization of markets. Xie and Hannum (1996) approximated “marketization” with regional economic growth rate and found returns to human capital (schooling) were negatively associated with marketization.² Parish and Michelson (1996), Nee (1996), and Nee and Cao (1999) developed a typology of regions (grouped on the basis of provinces) to approximate the local context of marketization. These approaches to measure marketization *per se*, however, are far from ideal and consequently subject to criticisms (see Walder 1996).

Given the mixed economies in contemporary China, it seems logical to compare differences across sectors. Based on a sector’s closeness to the market, the differences in

¹ According to Szelenyi (1978, 1983), since market and redistribution are two qualitatively different mechanisms that generate inequalities, inequalities under one system (redistribution) can be reduced by introducing the alternative (market) as a counterbalancing mechanism. As market arises to a dominant mechanism, inequality then increases. Both the early decline and the later increase in income inequality are due to the emerging market economy. Peasants and ordinary workers (direct producers) can be better off in the early reform era than in the pre-reform era by participating in market activities and gaining subsidies, and thereby reducing their income disadvantages in the redistributive hierarchy.

² A recent study by Hauser and Xie (2001) shows, despite overall increases in earnings returns to schooling from 1988 to 1995, that the increases are negatively associated with the pace of economic growth at the city level.

earnings determinants may be interpreted as the consequence of marketization. The institutional distinction is commonly drawn between the state and market sectors. Higher returns to human capital (e.g., education) in the market sector than in the state sector are conceived as evidence consistent with market transition theory (Cao and Nee 2000; Knight and Song 1993; Tang and Parish 1999; Wu 2002a). Using a continuum of workplaces (*danwei*) categorized by their degree of marketization (i.e., government agencies, public organizations, central government firms, local government firms, collective firms, and hybrid/private firms) is seen as another way to measure the extent to which marketization has affected workers' earnings (Zhou 2000a).

While these sector/workplace measures are relatively easy to collect and theoretically appealing, this approach has overlooked the fact that labor markets, if assumed to be in operation, are somewhat fluid at the local level (Hauser and Xie 2001). That is to say, the sorting of workers into different sectors/workplaces is unlikely to be exogenous, especially from the state sector to the market sector. Whereas Eastern Europe and the former Soviet Union adopted a strategy of transforming their redistributive economies through a radical privatization policy, China has chosen an incremental path to expand its new non-state economy, resulting in gradual shrinkage of the state sector (Lin, Cai, and Li 1994; Pei 1996; Qian 1999). In this light, the primary thrust in the economic transition came from the growth of new private and semi-private sectors that gradually caught up with and overtook the state sector. Consequently, in a mixed economy such as China's, the transition of workers from the state to the market sectors is an integral part of the multi-faceted process of market transition. The labor market sorting process *per se* could exert a great impact on the labor market outcomes such as earnings.

Participants in the market transition debate (see *AJS* symposium 1996 vol. 101) have so far paid inadequate attention to labor markets -- the central institution directly responsible for

generating income inequalities. While researchers have chosen to analyze income/earnings as a key outcome measure, the labor market as the concrete institutional context remains elusive. In examining changing patterns of income distribution, we must explicitly account for the changing scope of labor markets conditions, which reflects an important aspect of the institutional transition from redistribution to markets.

Moreover, in addressing the central question of who wins and who loses in the market transition debate, the conception of social actors remains largely static. Scholars are too focused on which groups have gained advantages at the expense of other groups, not realizing that individuals' membership in such groups could easily change over time. Thus, before answering the question of *who* has gained and lost, we need to understand *how* various social actors have responded to the pressures of the economic reform.

As Szelenyi and Kostello (1996) point out, whether the cadres or former cadres are winners in post-socialist Poland and Hungary is a complex issue, depending on the ways they associated themselves with market opportunities. A fraction of the old *nomenklatura* who entered the market has become the new corporate bourgeoisie, while most old communist elite members are losers on the sideline. In the late 1980s, returns to education in urban China were seriously distorted by the segmented labor markets under different reward systems. An egg-cake vendor's daily earnings could surpass a university professor's monthly salary, mainly because the reward system for the latter was rigid and limited in the redistributive economy (Li and Hong 1993; Zhao 1993; Zhou and Tan 1996). Within the state sector, returns to education are lower for bonuses set by work units than for base salaries set by the government (Walder 1990; Wu 2002a). Over time, the economic reform in urban China afforded opportunities for workers to move out of the state sector. Thus, the winners or losers of the market transition are not defined

until we take into account concrete institutional settings within which they move across sectoral boundaries in the labor market. It is in this sense that we say that workers are dynamic social actors who are not simply affected by the market, but rather respond to it by actively situating themselves in the labor market.

Indeed, this perspective of dynamic social actors can help us understand some empirical results reported in the literature on market transition. Various surveys conducted in the mid-1980s China have shown that most private entrepreneurs and self-employees (*getihu*) were migrant peasants, unemployed youth, people dismissed by work units, criminals released from prisons, and retirees (Li 1993: 323-30). This finding supports Szelenyi and Kostello's argument (1996) that in early stages of economic reform the early entrants to the market sector tended to be those in the low tiers of social hierarchy who were not at risk of losing the privileges enjoyed by workers in the state sector.

However, as marketization proceeded and risks in the market were further reduced, workers with marketable skills began gradually switching to the market sector to grasp new opportunities there. Communist cadres also learned to embrace the market and cash in their political and social capitals. With the competition from these groups, the early market pioneers were marginalized or in certain situations even wiped out. In China, waves of professionals and government officials have entered the market -- or "jumped into the sea" (*xiahai*) -- since 1992 (Chen 1993).³ Meanwhile, workers in state-owned enterprises who were part of the mass layoffs (*xiagang*) occasioned by further economic reform in the 1990s were pushed into the market sector for their livelihoods (Ketizu 1997; Lee C. 1999; Lee H. 2000).

³According an estimate by the China Ministry of Personnel, in a single year of 1992 more than 120,000 cadres resigned from their posts in the government and joined in the market activities (Chen 1993).

As a result, the workers entering the market sector in the later stages of the economic reform are likely to include both those who were “pushed” and those who “jumped” (Hauser and Xie 2001). While the laid-off workers from state enterprises are likely to have lower human capital and political capital, cadre and professionals who chose to give up their “iron rice bowls” voluntarily tended to have better education and/or possess the political capital needed to gain new advantages in the market. Pooling these two very different groups together creates a heterogeneous body of later market entrants who, as a group, appear to have high returns to education.

Hence, we question the prevailing wisdom that marketization *per se* causes high returns to human capital among workers in the market sector. Instead, we propose that the explanation may lie in sorting processes of workers into the market sector. In our view, many of the controversies in the current literature are rooted in inattention to individual workers’ dynamic experience of mobility across sectors in China’s mixed economy. The main purpose of this paper is to link macro-level socioeconomic transitions and changes in workers’ economic positions by introducing individual workers’ labor market histories as an intermediate process.

Workers’ Transition in Labor Markets: Typology and Hypotheses

The foregoing discussion calls for a better understanding of social actors with different experiences in the labor markets in reform-era China. Toward this goal, we propose a typology of workers based on their work histories. First, we categorize all workers in the urban labor force into two groups: those in the state sector and those in the market sector. Although job mobility may often occur within each sector, mobility across the sectors is less frequent but has a far more significant implication for the changing relative strength of the redistributive and market

economies in the post-socialist transition (Wu 2002b; Zhou, Tuma and Moen 1997). Because it is particularly difficult to move from the market to the state sector, labor mobility is generally a one-way transition from the state to the market.

Characterizing workers based on their mobility histories in labor markets requires knowledge of their current and previous work sectors. Combining information pertaining to a worker's sector status at two points in time, we obtain a two-by-two table that specifies four types of workers.

In Table 1, the first type, which describes a majority of Chinese workers, are those who were in the state sector initially and have continued to stay there. We name them "stayers." The second type ("later entrants") describes those who began in the state sector but later transferred to the market sector. As previously mentioned, this group consists of two subcategories: those who elected to enter the market sector and those who were forced to leave the state sector. The third type ("market losers") includes those who initially were in the market sector but later retreated to the state sector. Given the rigid institutional boundary between the two sectors, very few workers have re-entered the state sector. The last type ("early birds") consists of those who entered the market early and have stayed there.

Using this classification of workers, we draw implications in earnings inequality and returns to education among them. We begin with a well-accepted hypothesis:

Hypothesis 1: Returns to education in earnings are higher in the market sector than in the state sector.

If the above hypothesis were confirmed, there could be two possible explanations, from which we would further derive two hypotheses. First, higher returns to human capital in the market sector can be interpreted as caused by market mechanisms *per se*, as the market and state

sectors may allocate and reward human resources in different ways (Bian and Logan 1996; Nee and Cao 1995; Zhao and Zhou 2001). As shown in Table 1, we can further separate market sector workers into “early birds” and “later entrants.” Because all workers in the market sector are subject to the same market mechanisms, both of these groups should have similar and relatively higher earnings returns to education than those in the state sector. Hence, we can test the following hypothesis:

Hypothesis 2a: Returns to education are higher for both later entrants and early birds than for stayers.⁴

Alternatively, as posited by Szelenyi and Kostello (1996), while early birds with little human and political capital may have benefited from the economic reform and marketization in the initial stage, they may have lost their advantages after more qualified people started transferring to the market sector (*xiahai*). The resulting stiffer market competition may have pushed the early birds to marginal positions in the sector, affording them neither a higher level of earnings nor higher returns to education than the stayers. This argument is central to our thesis here: that higher returns to education for all workers in the market sector are due to higher returns for later entrants only. That is, we focus on the following hypothesis:

Hypothesis 2b: Returns to education are higher in the market sector only for later entrants. Returns for early birds are not significantly higher than for stayers.

Hypotheses 2a and 2b are two competing explanations as to why returns to education are higher in the market sector than in the state sector. Figure 1 provides an intuitive illustration of the second explanation. If Hypothesis 2a is rejected and Hypothesis 2b is confirmed, then the

⁴ Workers in the state sector can be decomposed into “stayers” and “market losers”. Since “market losers” account for only 2 percent of the sample (42 cases), in the following we will use “stayers” in the state sector as the benchmark for comparison.

state-market disparity in returns to education can hardly be attributed to market mechanisms *per se*. Instead, the selectivity and heterogeneity of later markets entrants may help explain the group's distinct performance.

As described before, later entrants consist of two types of workers, those who were “pushed” out or laid off from the state sector (i.e., “involuntary entrants”), and those who voluntarily “jumped” into the market sector (i.e., “voluntary entrants”) to grasp new opportunities. Combining these two groups would likely yield a high rate of returns to education in the market sector, but would the returns differ significantly between the two groups? To test the heterogeneity and selectivity of later entrants, we pose the following hypothesis:

Hypothesis 3: Involuntary later entrants and voluntary later entrants are distinct from each other and subject to different mechanisms of selection. Involuntary entrants tend to possess unobservable characteristics negatively associated with potential earnings, while voluntary entrants tend to possess unobservable characteristics positively associated with potential earnings.

As illustrated in Figure 2, involuntary entrants, who have been forced to leave the state sector, tend to be concentrated in low-skilled jobs with low pay in the market sector (the lower-left zone of the graph), and tend to be less educated and negatively selective because they possess unmeasured traits undesired by the market. On the other hand, voluntary entrants tend to be highly educated and positively selective in the sense that their unmeasured traits are associated with high earnings in the market (the upper-right zone of the graph). Combining these two subgroups would yield higher returns to education (a steeper slope in Figure 2) for “later entrants” as a single group.

Data and Variables

1. Data

Our empirical analyses are based on the survey of “Life Histories and Social Change in Contemporary China” (1996), a multi-stage stratified national probability sample of 6,090 adults aged 20-69 from all regions of China (except Tibet). The survey gathered extensive information on respondents’ life histories and job activities. Because life in rural and urban China is very different, samples from rural and urban areas were drawn separately, yielding 3,003 rural cases and 3,087 urban cases (Treiman 1998: Appendix D). We use the urban half of the sample because few rural residents worked in the state sector, and market transitions in rural and urban China are fundamentally different (Peng 1992; Wu 2002b). After eliminating from this group those not active in the labor force, we had 2,076 respondents for the analysis.

In this paper, we investigate the process of labor market transitions in the period between 1987 and 1996. We selected 1987 as the benchmark year because the urban economic reform was initiated in 1986. Prior to 1986, private economy and labor markets were almost nonexistent, and few workers had transferred from the state to the market sectors. Therefore, in Table 1, 1987 is used for the year of the worker’s initial sector and 1996 for the year of the worker’s current sector.

2. Variables

Distinguishing the market sector from the state sector is crucial to the typology of workers proposed in Table 1. Three criteria can be employed: respondent’s affiliated work organization, respondent’s occupation, and respondent’s main source of incomes. As concerns the first criterion, newly emerging types of work organizations such as “corporate enterprises,” “domestic private enterprise,” “joint ventures,” and “foreign invested firms” are coded as market

sector organizations, whereas “government agencies,” “state institutions,” “state-enterprises,” and “collective enterprises” are coded as state sector organizations. Urban collective enterprises, although marginal to the redistributive core, are not the outcome of the market reform because they existed long prior to the reform. To a large extent, the urban collective enterprises resembled state enterprises in operating mechanisms and management styles.

Second, the state versus market sectors can also be defined according to occupation. We code occupations of “self-employment” (*getihu*) and “private enterprise owner” (*siying qiye zhu*) as market occupations. Changing from a state job to one of these two categories is considered entry into the market sector. This definition may overlap with that based on work organization.

Since a worker may participate in economic activities in the market without necessarily changing occupations or work organizations, we employ a third criterion to broaden the definition of the market sector. If a respondent’s main source of income is from “running a business,” or an “independent occupation,” or “helping others’ business,” then they are coded as working in the market sector, even if their occupation and work organization are in the state sector.

Figure 3 presents the percentages of workers in the market sector, as defined by each of these three criteria, during the period covered by the survey data (1949 to 1996). The definitions of the market sector based on occupation and work organization yield similar percentages. The definition based the main source of incomes is broader, yielding higher percentages of workers in the market sector. Results from all three definitions are consistent with the historical trend we observed from China’s national statistics: after 1956, when the socialist transformation of private industry and trade was completed, the market sector was essentially eradicated until the market-oriented economic reform started in the late 1970s. Consistent with the pace of market transition,

the percentages of workers in the market sector, by all the three definitions, have increased substantially since the mid-1980s. In this study, we take a conservative approach – coding workers in the market sector if they meet any of the three criteria – which gives us an adequate number of cases in our market sector data.

Our dependent variable is the monthly total of earned income, regardless of whether it is from regular wages or earnings from market businesses. For most respondents, we use monthly income from a job (averaged over the preceding year). For non-wage earners (mostly in the market sector), we impute monthly earnings by dividing the net income from their family business in 1995 by the number of working family members, and by 12 months. We take the logarithm of the monthly earnings as our dependent variable in multivariate analyses.

Our empirical analyses contain two parts: in the first part, we examine the difference in returns to education among four types of workers based on a modified human capital model. The independent variables include education, work experience, party membership, and gender. Education, a continuous variable, is measured in terms of years of schooling completed. Work experience is approximated by the difference between the year of 1996 and the year when the respondent first entered the labor force. Because many previous studies have shown that the relationship between experience and earnings is curvilinear, we add a square term of work experience in regression equations. Party membership, which denotes political capital in China, is coded as a dummy variable (yes = 1), as is gender (male = 1).

In the second part, we distinguish between voluntary and involuntary later entrants, and examine how the selection processes differ for the two subgroups. In addition to the independent variables mentioned above, we include three more variables that may predict market entry: the father's work sector, the respondent's marital status, and region of residence. Because

entrepreneurialism may be transferred across generations (Szelenyi 1988), we include a dummy variable indicating whether a respondent's father was in the market sector when the respondent was age 14 (yes = 1). Marital status, an important life course variable, is also coded as a dummy (currently married or remarried = 1).

Finally, because large regional variations in economic structure and the pace of marketization create varying opportunities for entering the market sector, we control for region of residence. The sample was drawn in 50 cities/ counties clustered in 24 heterogeneous provinces/provincial-level jurisdictions.⁵ We map the respondents into six relatively homogeneous regions and denote them by a set of dummy variables. In the southern province of "Guangdong" marketization is far ahead of that in the rest of China. Three "central municipalities" (Beijing, Shanghai, and Tianjin) are metropolitan cities directly under the central government's jurisdiction. "Coastal provinces" include Jiangsu, Fujian, and Shandong, where the marketization also started earlier. Three "northeastern provinces" (Liaoning, Jilin, and Heilongjiang) share many similarities in economic structures as China's major base of heavy industry. "middle provinces" include Hebei, Shanxi, Anhui, Jiangxi, Henan, Hubei, Hunan; and "western provinces" include Sichuan, Guizhou, Yunnan, Gansu, Shaanxi, and Guangxi.

Table 2 provides descriptive statistics for the main variables included in the following analyses, by work sector in 1996 and by four types of workers. Of 2,079 workers in the urban labor force, 1,558 were in the state sector and 521 were in the market sector in 1996. For workers in the state sector, the majority started their first jobs in the state sector and had stayed there, while only 42 had transferred from the market sector. As expected, mobility from the

⁵ They include Beijing, Tianjin, Hebei, Shanxi, Neimenggu, Liaoning, Jilin, Heilongjiang, Shanghai, Jiangsu, Anhui, Fujian, Jiangxi, Shandong, Henan, Hubei, Hunan, Guangdong, Guangxi, Sichuan, Guizhou, Shaanxi, Gansu.

market sector to the state sector is rare. Among those workers in the market sector, 294 started their jobs in the state sector but later transferred to the market sector, and 227 workers entered early and had stayed there.

Difference in Returns to Education

1. Models

We employ a modified human capital model based on the classic human capital model of Mincer (1974), with the addition of gender, and an indicator of political capital measured by party membership (Walder 1990; Xie and Hannum 1996). The model is specified as:

$$\log(Y) = \beta_0 + \beta_1 \text{EDUC} + \beta_2 \text{EXP} + \beta_3 \text{EXP}^2 + \beta_4 \text{PARTY} + \beta_5 \text{SEX} + \varepsilon, \quad (1)$$

where ε represents the residual unexplained by the baseline model and β parameters are regression coefficients measuring returns to respective independent variables.

To measure earnings differences by sector and to allow returns to education to vary by sector, a model with an interaction term between education and sector in 1996 can be fitted as:

$$\log(Y) = \beta_0 + \beta_1 \text{EDUC} + \beta_2 \text{EXP} + \beta_3 \text{EXP}^2 + \beta_4 \text{PARTY} + \beta_5 \text{SEX} + \beta_6 \text{SECTOR} + \beta_7 \text{SECTOR} * \text{EDUC} + \varepsilon \quad (2)$$

where SECTOR is a dummy variable indicating whether the respondent is in the market sector (yes=1); β_6 is earnings difference by sector when education is equal to zero; and β_7 denotes the difference in returns to education between the market and state sectors.

To classify workers into four groups and compare returns to education among them, a similar model with interaction terms between education and worker type is specified as:

$$\log(Y) = \beta_0 + \beta_1 \text{EDUC} + \beta_2 \text{EXP} + \beta_3 \text{EXP}^2 + \beta_4 \text{PARTY} + \beta_5 \text{SEX} + \beta_{6j} \text{TYPE}_j + \beta_{7j} \text{TYPE}_j * \text{EDUC} + \varepsilon \quad (3)$$

where $j = 2, 3, 4$; TYPE_j is a set of dummies referring to later entrants ($j=2$), market losers ($j=3$), and early birds ($j=4$), with stayers as the reference; β_{6j} denotes the difference in earnings by worker type when

education equals zero; and β_{7j} denotes the difference in returns to education by worker type.

Because the survey research design (see details in Treiman 1998) necessitated clustering the sample within 50 city districts/counties, an adjustment on standard errors is needed in regression analyses. All the models reported were estimated using Stata 7.0, with robust standard errors to correct the clustering on sampling units (districts/counties) (Stata Corp. 2001). The data were appropriately weighted to represent the Chinese general population.

2. Results

Table 3 reports the estimates for models of earnings determination. Model 1 is a baseline model, in which education; work experience and its square term; party membership; and gender are included as predictors (Eq. 1). All variables have significant effects on earnings. The rate of returns to education is about 5 percent ($=e^{0.048}$), slightly higher than other estimates (Byron and Manaloto 1990; Walder 1990; Xie and Hannum 1996; Hauser and Xie 2001). Party members enjoy a 11 percent ($=e^{0.099}-1$) advantage. As expected, the effect of work experience on earnings is concave, first increasing with experience early in the life course, and then diminishing after reaching the optimal number of years (about 30) of work experience. Gender difference in earnings are also estimated to be large, with men earning 27 percent ($=e^{0.240}-1$) more than women, other things being equal.

In Model 2 and Model 3 of Table 3, we compare the earnings regimes between the state sector and the market sector. Model 2 is an additive model with sector included as a dummy variable. It is shown that workers in the market sector earn 28 percent ($=e^{0.246}-1$) more than their counterparts in the state sector. To further examine differential returns to education between the two sectors, we fit a model with an interaction term between sector and education (Eq. 2). The positive coefficient for the interaction term (β_7) is statistically significant ($p < .01$), suggesting

that returns to education are higher in the market sector than in the state sector. One additional year of schooling increases earnings by 9.7 percent for workers in the market sector, but only 4.9 percent for workers in the state sector, holding constant the other factors. This finding lends support to Hypothesis 1 and confirms what have been found in early studies (Bian and Logan 1996; Zhao and Zhou 2001; Zhou 2000a; Cao and Nee 2000).

However, it would be premature to conclude from the above results that a market economy utilizes human resources better and thereby yields higher rewards to education than a redistributive economy. Such a high rate of returns could be largely attributed to the sorting process of workers in labor markets, rather than market mechanisms *per se*. Therefore, we decompose workers into four types based on their labor market histories, as specified in Table 1. In Model 4 of Table 3, we fit an additive model, which only allows the intercepts to vary by worker type. Results show that, among workers in the market sector in 1996, *only* later entrants enjoyed significantly higher earnings than those who stayed in the state sector – 24 percent higher on average, other things being equal. If the market *per se* pays off, the early birds should have more advantages since they had accumulated more human capital (i.e., experience) specific to the market sector. Nevertheless, we find that the early birds seem to have no advantage in earnings compared to workers who have stayed in the state sector. Our results seem to support the speculation by Szelenyi and Kostello (1996) that early market entrants tend to be pushed to marginal positions as more qualified people enter the market sector, depriving them of any potential earnings advantage.

Furthermore, in Model 5 of Table 3, we specifically examine how returns to education differ among the four types of workers. We allow education to interact with worker type (Eq. 3). The coefficient of the interaction term β_{7j} indicates the difference in returns to education between

each of the other type of workers (*j*) (later entrants, market losers, and early birds) and the reference group (stayers). In Model 5, we found no differences in returns to education between market losers and stayers nor between early birds and stayers. It is worth noting that early birds seem to have been overtaken by later market entrants by 1996 in terms of both earnings and earnings returns to education. This evidence is contrary to Hypothesis 2a and supports its alternative Hypothesis 2b.

As shown here, the commonly observed differentials in both earnings and returns to education between the state sector and the market sector are due entirely to the outstanding performance of later entrants. Model 5 indicates that later entrants, in addition to having significantly higher earnings than stayers, also enjoy higher returns to education. Other things being equal, an additional year of schooling increases earnings of later entrants by 9.5 percent ($=e^{0.047+0.044}-1$), compared to a rate of increase at 4.8 per cent ($=e^{0.047}-1$) for workers staying in the state sector. Our early result of a sharp contrast between the market sector and the state sector from Model 3 (9.7 percent versus 4.9 percent) is almost replicated here. In terms of earnings, education is more valuable for later entrants, not simply because they work in the market sector (otherwise, early birds should have had the same advantages), but because they transferred from the state sector. This suggests that the selective process of the transition could have engendered the observed results.

To summarize, we have found that past labor market experiences distinguish workers within the market sector, with the earnings advantage of the market sector being limited to later entrants. Early birds, despite of their longer exposure to market competition, have no advantages in either earnings or earnings returns to education over those who remained in the state sector. Thus, it appears that it is not the market *per se* that renders higher rewards to later market

entrants.

An intriguing question is why education is rewarded more highly for later entrants to the market sector. As we argued before, the heterogeneity among later entrants could be a critical factor. In the remainder of this paper, we distinguish between voluntary and involuntary transitions among later entrants and examine the different mechanisms in selecting workers into these two subgroups.

Involuntary and Voluntary Entrants: Different Selection Mechanisms

1. Involuntary Entrants and Voluntary Entrants

As marketization deepens and the market sector expands in urban China, two simultaneous trends emerged in regard to workers' entry into the market sector, especially after 1992. On the one hand, a growing number of qualified workers voluntarily gave up career opportunities in the state sector to enter the market sector. On the other hand, a growing number of workers in state enterprises that were performing poorly were laid off and forced to enter the market sector (Lee C. 1999; Lee H. 2000). Later entrants consist of both these voluntary and involuntary entrants.

Our empirical data do not contain a direct measurement of respondents' motivations for making labor market transitions. Thus we have no explicit information on whether a respondent's market entry is voluntary or involuntary. However, assuming workers are rational actors who can weigh gains and losses in deciding whether or not to make a transition, the distinction can be made by comparing the observed labor market outcome (actual earnings in 1996) of later market entrants to their counterfactual earnings had they stayed in the state sector until 1996. We operationalize "involuntary entrants" as those who were economically not significantly better off in the market sector than they would have been in the state sector, and

“voluntary entrants” as those who are much better off than they would have been in the state sector.

To estimate later entrants’ counterfactual earnings in the state sector, we first regress logged earnings on education, years of schooling, experience and its square term, and party membership for workers actually in the state sector in 1996. We then predict later entrants’ counterfactual earnings using the estimated equation with their observed characteristics, which projects expected earnings for later entrants had they stayed in the state sector (we know that they were no longer in the state sector in 1996).

By comparing the counterfactual earnings with actual earnings, we create a dummy variable indicating whether or not these workers made a voluntary transition. Because workers in the state sector enjoy some non-monetary benefits unavailable to workers in the market sector, we assume that workers would voluntarily transfer to the market sector only if their market earnings (excluding cash compensation for the loss of welfare benefits) were much higher than their earnings in the state sector. Thus, we define “voluntary entrants” as those whose actual earnings in the market sector are at least 80 percent higher than their counterfactual earnings in the state sector.⁶ That is:

$$\begin{aligned} (Y_m - Y_s) / Y_s > 0.8 \\ \text{or } Y_m / Y_s > 1.8, \end{aligned} \tag{4}$$

where Y_m , refers to a respondent’s actual earnings in 1996, and Y_s refers the respondent’s

⁶ The non-monetary benefits that were provided by the state sector accounted for at least 50 per cent of the total wage bills (Ketizu 1997; Lee C. 1999:47). This suggests that one has to earn at least 50 per cent more in market wages to compensate for the loss of non-monetary benefits. We put an additional rate of 30 per cent as the incentive for people to *voluntarily* transfer to the market sector. This rate is about the same as the wage gap between state and market employees (SSB 1997). Therefore, voluntary market entrants essentially refer to those who earn market wages without losing state non-monetary benefits (or being compensated in cash).

counterfactual earnings in the state sector. Rearranging the inequality and taking the logarithm on both sides, we obtain the following:

$$\ln(Y_m) > \ln(Y_s) + \ln(1.8) \quad (5)$$

Based on the above inequality, we distinguish two subgroups of later entrants from our total of 294: 102 voluntary entrants who earned at least 80 percent higher than what they would have in the state sector and 192 involuntary entrants who did not. Figure 4 is the scatter-plot between the logged earnings and years of education for later entrants. As clearly shown in the graph and consistent with the scenario portrayed in Figure 2, voluntary entrants are disproportionately concentrated in the upper right zone with both high education and high earnings, whereas involuntary entrants are disproportionately concentrated in the zone with both low education and low earnings. The average years of schooling are 8.63 years for voluntary entrants and 7.63 years for involuntary entrants (weighted). A t-test shows that the difference is statistically significant ($p < .001$).

[FIGURE 4 ABOUT HERE]

After the disaggregation of later entrants, we then examine the difference in returns to education among the five groups of workers, as shown in Table 4. We first fit an additive model (Model 1) and then allow returns to education to vary across stayers, involuntary later entrants, voluntary later entrants, market losers, and early birds (Model 2). Model 1 shows that, in comparison to stayers, neither market losers nor early birds enjoy earnings advantages, and although voluntary later entrants earn more than three times ($=e^{1.150}$) as much as stayers, involuntary later entrants earn only about 80 percent ($=e^{-0.237}$) as much, other things being equal. Model 2 of Table 4 reveals no significant difference in returns to education between involuntary later entrants and stayers, while voluntary later entrants enjoy a slight advantage over stayers in

regard to returns to education ($p < .05$). One additional year of schooling increases earnings by 8 percent for voluntary entrants but only by 5 percent for stayers. A Wald test indicates no statistical difference in returns to education between involuntary and voluntary later entrants.

2. Different Selection Mechanisms for Involuntary and Voluntary Entrants

To further investigate heterogeneity among later entrants, we examine and compare the processes of selection into involuntary and voluntary later market entrants. As conceptualized before, involuntary entrants were forced to leave the state sector (due to layoffs), whereas voluntary entrants were self-starters attracted by high rewards in the market sector. The two groups could be significantly different in observable and unobservable characteristics from each other and from workers who stayed in the state sector.

To account for unobserved heterogeneity that may underlie both market entry and earnings potential, we employ Heckman two-stage selection models. We first deal with the selection into involuntary later entrants from those who were initially in the state sector. In the first stage, a standard probit model for the process of selection into involuntary entrants is formulated as follows:

$$Z^* = \gamma' X_1 + u \quad (6)$$

where Z^* is the latent variable for $z=1$ (involuntary entrants) if $Z^* > 0$, and $z=0$ if $Z^* \leq 0$. Z^* is specified as a linear function of a set of explanatory variables plus a residual term u , which is assumed to follow a standard normal distribution ($u \sim N [0, 1]$).

In the second stage, we apply the modified human capital model (Eq. 1) to involuntary later market entrants:

$$\ln(Y) = \beta' X_2 + \varepsilon \quad \text{observed only if } z=1. \quad (7)$$

Eq. (7) is restricted to involuntary entrants. This equation may not be estimated via OLS

regression since

$$E[\varepsilon | Y \text{ is observed}] = E[\varepsilon | z=1] = E[\varepsilon | Z^* > 0] = E[\varepsilon | u > -\gamma'X] = 0$$

holds true only when the correlation (ρ) between the residual terms ε and u is equal to zero. OLS estimates will be biased if the two residual terms in two equations are correlated.

Allowing for a potential correlation between the two residual terms (i.e., ρ is not equal to zero), Eq. (7) is estimated by adding to OLS regression an additional predictor λ , calculated using the fitted values of Z^* from the estimation of Eq. (7). The estimated coefficient for this term will be equal to $\rho\Phi$, where ρ is the correlation between two residual terms u and ε , and Φ is the standard deviation of ε (Greene 2000; Heckman 1979; Raymo and Xie 2000; Willis and Rosen 1979; Winship and Mare 1992). Since Φ is always positive, a negative correlation ($\rho < 0$) between the two residual terms means a negatively selectivity: those workers who entered the market sector involuntarily have lower potential earnings than those who actually stayed in the state sector. In contrast, a positive correlation ($\rho > 0$) would suggest a positive selectivity.

In estimating the probit model of selection into involuntary later entrants, we include the father's work sector when the respondent was age 14 and the respondent's marital status and region as predictors, in addition to the variables in the earnings equation. For the earnings equation, we use the baseline modified human capital model (Eq. 1). Analogously, we estimate Heckman two-stage models for voluntary market entrants.

Table 5 presents two-stage coefficient estimates for both involuntary later market entrants (Model 1 and Model 2) and voluntary later market entrants (Model 3 and Model 4). In Model 1, both education and party membership strongly protect workers from being laid off and pushed into the market sector. Other things being equal, one year of schooling decreases the probit coefficient of education by 0.114, and being a party member decreases the probit

coefficient by 0.083 ($p < .001$). Model 3 also shows a negative association between education and the likelihood of voluntary market entry: one additional year of schooling decreases the probit coefficient of education by 0.096, net of other factors. Party members are less likely than non-party members to voluntarily transfer to the market sector, but the difference is insignificant at the conventional level ($p = 0.053$). This suggests that, compared to those who continue to stay in the state sector, involuntary market entrants and voluntary market entrants differ in some observable characteristics. It seems that workers with greater human and political capital are less likely to be pushed from the state to the market sector, but may instead jump to the market sector when they are able to take advantage of more attractive rewards and newly available opportunities.

As to regional effects, only workers in Guangdong have significantly higher probabilities of transition to the market sector, both involuntarily and voluntarily, than their counterparts in Western provinces. There is no noticeable difference in market entry across other regions. This suggests Guangdong's advanced pace of economic reform and marketization, which have acted to both increased layoffs in state-owned enterprises and attract workers to jobs in the market sector.

The significant coefficients for λ indicate that the OLS estimates for the earnings equations are biased for both involuntary and involuntary later entrants. The estimated value of ρ (-0.59) for involuntary later entrants indicates a strong negative selectivity (i.e., higher earnings potential is associated with a lower likelihood of involuntary market entry). In contrast, the estimated value of ρ (0.46) for voluntary later entrants indicates a strong positive selectivity (i.e., voluntary later entrants have earned more than if they were randomly transferred from the state to the market sector). Net of the selectivity, Model 2 and Model 4 of Table 5 present the

unbiased estimates of OLS parameters in earnings equations respectively for both involuntary and voluntary later market entrants. For the former, the rate of net returns to education increases from 4.4 percent ($=e^{0.043} - 1$) to 7.3 percent ($=e^{0.070} - 1$) after the correction ($p < .001$). For the latter, the rate of net returns to education decreases from to 9.5 percent ($=e^{0.091} - 1$) to 6.6 percent ($=e^{0.064} - 1$) after the adjustment, and the effect is still statistically significant ($p < .01$). A t-test for the difference in the education coefficient between involuntary and voluntary later market entrants is insignificant.

Although party membership strongly protects workers from being pushed into the market sector, the advantage of party membership is huge among workers who do involuntarily enter the market sector: party members earn 96 percent ($=e^{0.672}$) more than non-party members, other things being equal. However, party membership has no significant effect on earnings for voluntary market entrants. Again, this suggests that the market mechanism *per se* does not decrease or increase the role of party membership in earnings determinations. We speculate that for involuntary entrants, who tend to be concentrated in the fields of self-employment and small businesses, social connections (*guanxi*) associated with party membership may play a more important role in earnings. Thus the effect of political advantage on economic advantage in the market sector depends on the route of entering the market.

Although a systematic sensitivity analysis is not conducted, we have explored a few other models with threshold rates ranging from 50 percent to 100 percent. Figure 5 plots the results on returns to education and significance levels of selectivity for both involuntary and voluntary later entrants at selected rates (see Eq. 4). Returns to education are invariant with the change of rate. Especially when the rate is over 70 percent, the difference in the estimated coefficients for education between involuntary and voluntary market entrants is almost negligible. As to the level

of selectivity biases, when the rate is set close to 50 percent, we see a significant selection into the group of involuntary entrants ($p < .05$) but an insignificant selection into the group of voluntary entrants. If the threshold is set low, some involuntary entrants who did slightly better in the market may have been included in the group of voluntary entrants, thus the positive selection into the group of voluntary entrants may become less obvious.

In summary, the results in Table 5 suggest different mechanisms of selection for voluntary and involuntary later market entrants, lending support in favor of Hypothesis 3. Workers with unmeasured characteristics associated with low earnings potential are more likely to be laid off and enter the market sector involuntarily. In other words, involuntary entrants actually do worse than would have been the case without the selectivity. On the other hand, workers with unmeasured characteristics associated with high earnings potential are more likely to voluntarily enter the market sector, so they actually do better than would have been the case without the selectivity. After selection biases are corrected, differentials in returns to education among voluntary entrants, involuntary entrants, and stayers, cease to exist.

Conclusions and Discussion

Previous literatures on the market transition debate have missed the direct link between *individuals'* labor market histories and *individuals'* labor market outcomes. In this paper, we developed a typology of workers based on their job histories. We proposed a model of selective transition of workers from the state sector to the market sector, and derived 4 hypotheses in regard to earnings inequality and earnings returns to education. Although our results confirm the prevailing wisdom that returns to education are higher in the market sector than in the state sector, no differences, in either earnings or returns to education, have been found between early

birds in the market sector and stayers in the state sector. Instead, the observed differences are limited to later market entrants. These findings run counter to the claim that market mechanisms *per se* lead to high returns to human capital and indicate the need a better understanding of the dynamic processes of social actors during market transition. Workers entering the market sector in the initial stage of the urban economic reform no longer enjoyed advantages in either earnings or returns to education in 1996. The major winners in the market transition are later market entrants (Szelenyi and Kostello 1996; Wu 2002b).

Further analysis provides an alternative explanation for the higher returns to education for later market entrants. After disaggregating the two types of later entrants -- those who were “pushed” and those who “jumped” into the market sector -- and correcting selection biases, we find no significant difference in returns to education among voluntary entrants, involuntary entrants, and workers staying in the state sector. We conclude that higher returns to education in the market sector of a transition economy cannot be construed as caused by marketization *per se*. The sorting process of workers in labor markets helps explain the results.

Our findings suggest that researchers should reconsider the implications drawn from sectoral comparisons in addressing the social consequences of market transition in post-socialist countries (e.g., Cao and Nee 2000; Tang and Parish 1999; Zhao and Zhou 2001; Zhou 2000a, 2000b). While the argument that the institutional structure of an economy is important in determining social stratification outcomes is undisputed, sectoral distinctions do not necessarily lead to the difference in economic returns to education. Vice versa, without critically examining the labor market conditions, imputing the institutional significance from the sectoral differences in returns to education is unwarranted. Furthermore, researchers should also be cautious when interpreting the temporal trend of returns to education in the reform era. The increase in the role

of education as an earnings determinant could result from the changing sectoral composition of the economy and workers' increasing mobility into the market sector over time, rather than marketization *per se*.

The evidence that the state and market institutions do not differ in rewarding human capital (education) may be striking, but not surprising. Comparative studies have shown that education assumes a universally important role in social stratification and mobility in all modern societies, regardless of socialist or capitalist (Shavit and Blossfeld 1993). From a perspective of economic and labor market segmentation, market economies are commonly divided into two sectors -- core and peripheral sectors, or primary and secondary labor markets -- which are believed to be fundamentally different (Althausser and Kalleberg 1981; Beck, Horan and Tolbert 1978; Cain 1976; Hodson and Kaufman 1982). Yet several empirical studies have found no sectoral difference in income/wages determination in the United States, particularly in terms of human capital variables (e.g., Sakamoto and Chen 1991; Zucker and Rosenstein 1981). Why do the global institutional differences have little impact on the sectoral difference in earnings returns to education? Dual labor market theorists have extensively examined how the concrete institutional factors such as unionization, establishment size, and occupational structures within each sector ameliorate the effect of education on wages (see summary in Sakomoto and Chen 1991). We believe that scholars studying stratification outcomes in post-socialist societies should move in a similar direction by examining concrete institutional parameters within the state sector or the market sector, rather than presuming the overarching dichotomy. Understanding the actual social processes of the transition is much more important than tailoring empirical results to fit a grand theoretical assertion.

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Table 1 Typology of Workers in Labor Market Transition

	Current State Sector	Current Market Sector
Initial State Sector	Type I (Stayers)	Type II (Later Entrants)
Initial Market Sector	Type III (Market Losers)	Type IV (Early Birds)

Table 2. Summary Statistics of Variables in Regression Analysis of Income Determination in Urban China 1996

Variables	Monthly Income (YUAN)	Monthly Income (logged)	Education (years of schooling)	Experience (years)	Party member (yes=1)	Gender (male=1)	Number of cases
Overall	564.4 (727.7)	6.067 (0.671)	9.513 (3.382)	21.00 (10.97)	0.169	0.571	2079
State in 1996	486.2 (308.0)	6.042 (0.550)	9.978 (3.323)	21.23 (10.65)	0.216	0.575	1558
Type I	485.4 (306.6)	6.043 (0.543)	10.64 (3.308)	21.29 (10.64)	0.220	0.573	1516
Type III	515.2 (385.5)	6.000 (0.748)	8.524 (3.570)	18.90 (10.96)	0.071	0.667	42
Market in 1996	798.3 (1326)	6.142 (0.942)	8.125 (3.172)	20.34 (11.84)	0.029	0.560	521
Type II	709.3 (949.9)	6.146 (0.864)	7.980 (3.267)	19.87 (11.51)	0.037	0.517	294
Type IV	913.5 (1689)	6.136 (1.035)	8.313 (3.043)	20.94 (12.26)	0.018	0.617	227

Figures in parentheses are standard deviations

Table 3. Coefficient Estimates for Linear Regression on Earnings Determination: Urban China 1996: Two- Sector Analysis and Four-Group Analysis (N=2079)

Variables	Baseline	Two-sector Analysis		Four-group Analysis	
	Model 1	Model 2	Model 3	Model 4	Model 5
Education (years of schooling)	0.048 *** (0.009)	0.057*** (0.007)	0.048*** (0.007)	0.056*** (0.007)	0.047*** (0.007)
Experience	0.013*** (0.004)	0.014** (0.004)	0.012*** (0.004)	0.014*** (0.004)	0.012 ** (0.004)
Experience squared x1000	-0.217** (0.079)	-0.212* (0.079)	-0.161* (0.072)	-0.215* (0.081)	-0.163* (0.075)
Party member (yes=1)	0.099* (0.044)	0.144*** (0.037)	0.150*** (0.037)	0.144*** (0.038)	0.150*** (0.037)
Gender (male=1)	0.240*** (0.042)	0.229*** (0.038)	0.222*** (0.039)	0.229*** (0.037)	0.222*** (0.038)
Sector (market=1)	-	0.246* (0.118)	-0.140 (0.176)	-	-
Type I (stayers [omitted])					
Type II (later entrants)	-	-	-	0.217*** (0.057)	-0.150 (0.163)
Type III (market losers)	-	-	-	-0.076 (0.104)	-0.084 (0.486)
Type IV (early birds)	-	-	-	0.275 (0.212)	-0.131 (0.330)
Interaction effect:					
Sector*education	-	-	0.045** (0.016)	-	-
Type II* education	-	-	-	-	0.044** (0.018)
Type III*education	-	-	-	-	-0.0004 (0.047)
Type IV*education	-	-	-	-	0.047 (0.027)
Constant	5.271*** (0.145)	5.112*** (0.098)	5.215*** (0.102)	5.119*** (0.099)	5.222*** (0.106)
R square	0.108	0.129	0.137	0.130	0.138

Notes: figures in parentheses are robust standard errors adjusted for clustering on counties. Data are weighted.

*** p<.001 ** p<.01 * p<.05

**Table 4. Coefficient Estimates for Linear Regression on Earnings Determination:
Urban China 1996: Five-Group Analysis (N=2079)**

Variables	Model 1	Model 2
Education (years of schooling)	0.055*** (0.006)	0.049*** (0.007)
Experience	0.014*** (0.003)	0.013*** (0.004)
Experience squared *1000	-0.193* (0.077)	-0.158 (0.080)
Party member (yes=1)	0.131*** (0.035)	0.135*** (0.035)
Gender (male=1)	0.237*** (0.035)	0.232*** (0.036)
Type I (stayers[omitted])	-	-
Type IIa (involuntary later entrants)	-0.237*** (0.050)	-0.335* (0.135)
Type IIb (voluntary later entrants)	1.150*** (0.067)	0.891*** (0.137)
Type III (market losers)	-0.079 (0.106)	-0.082 (0.491)
Type IV (early birds)	0.269 (0.214)	-0.139 (0.331)
Interaction effect:		
Type IIa* education	-	0.011 (0.015)
Type IIb* education	-	0.029* (0.015)
Type III*education	-	-0.001 (0.047)
Type IV*education	-	0.048 (0.027)
Constant	5.122*** (0.088)	5.184*** (0.096)
R ²	0.247	0.252

Notes: Figures in parentheses are standard errors adjusted for clustering on counties. Data are weighted.

*** p<.001 ** p<.01 * p<.05

Table 5. Estimates for Heckman Two-Stage Selection Models on Involuntary and Voluntary Market Entrants: Urban China 1996

Variables	<u>Involuntary Entrants</u>		<u>Voluntary Entrants</u>	
	Model 1 Probit model	Model 2 Linear model	Model 4 Probit model	Model 4 Linear model
Education (years of schooling)	-0.114*** (0.016)	0.070*** (0.021)	-0.096*** (0.021)	0.064** (0.022)
Experience	-0.032* (0.015)	-0.001 (0.013)	0.028 (0.020)	-0.001 (0.017)
Experience squared *1000	0.314 (0.289)	0.032 (0.235)	0.004 (0.406)	0.092 (0.314)
Party member (yes=1)	-0.826*** (0.186)	0.672** (0.242)	-0.390 (0.201)	-0.349 (0.234)
Gender (male=1)	0.064 (0.089)	0.083 (0.083)	-0.045 (0.113)	0.358*** (0.106)
Father's sector (market=1)	0.219 (0.201)		-0.082 (0.293)	
Marital status	0.213 (0.147)		0.213 (0.182)	
Region (west omitted)				
Midwest	-0.090 (0.127)		-0.059 (0.165)	
Northeast	-0.034 (0.142)		-0.267 (0.200)	
East	-0.245 (0.142)		-0.346 (0.194)	
Central Municipalities	-0.068 (0.174)		0.283 (0.199)	
Guangdong	0.848*** (0.200)		1.338*** (0.217)	
Constant	0.225 (0.250)	5.590*** (0.210)	-0.225 (0.318)	5.938*** (0.216)
λ	-0.357* (0.146)		0.236* (0.112)	
ρ	-0.587		0.461	
N		1708		1618
Censored Cases		1516		1516
Model χ^2		113.31		68.38
DF		10		10

Notes: Figures in parentheses are standard errors estimated using Heckman procedure in Stata 7.0.

*** p<.001 ** p<.01 * p<.05

Figure 1. Illustrative Diagram of Competing Hypotheses in Explaining Higher Returns in the Market Sector

Hypothesis 2a

	Current State Sector	Current Market Sector
Initial State Sector	Type I (Stayers)	Type II (Later Entrants)
Initial Market Sector	Type III (Market Losers)	Type IV (Early Birds)

Hypothesis 2b

	Current State Sector	Current Market Sector
Initial State Sector	Type I (Stayers)	Type II (Later Entrants)
Initial Market Sector	Type III (Market Losers)	Type IV (Early Birds)

Note: Shaded area represents type(s) of workers for whom returns to education are especially high.

Figure 2: Labor Market Transition and Returns to Education
(Illustrative Diagram)

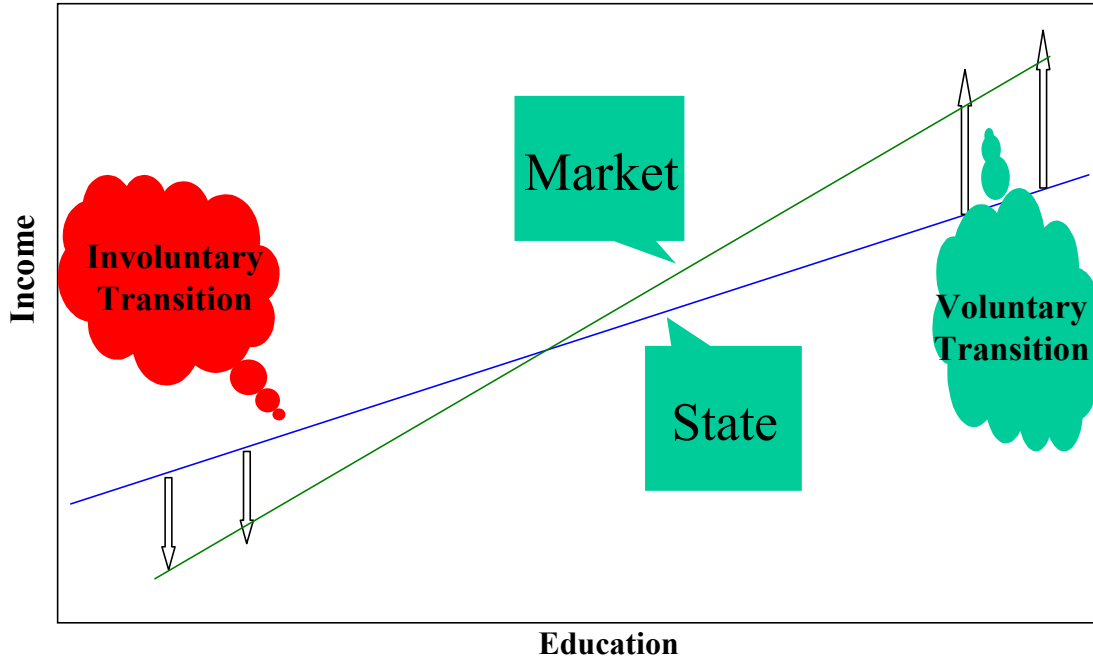


Figure 3. Percentages of Urban Workers in the Market Sector: Three Definitions Comparison

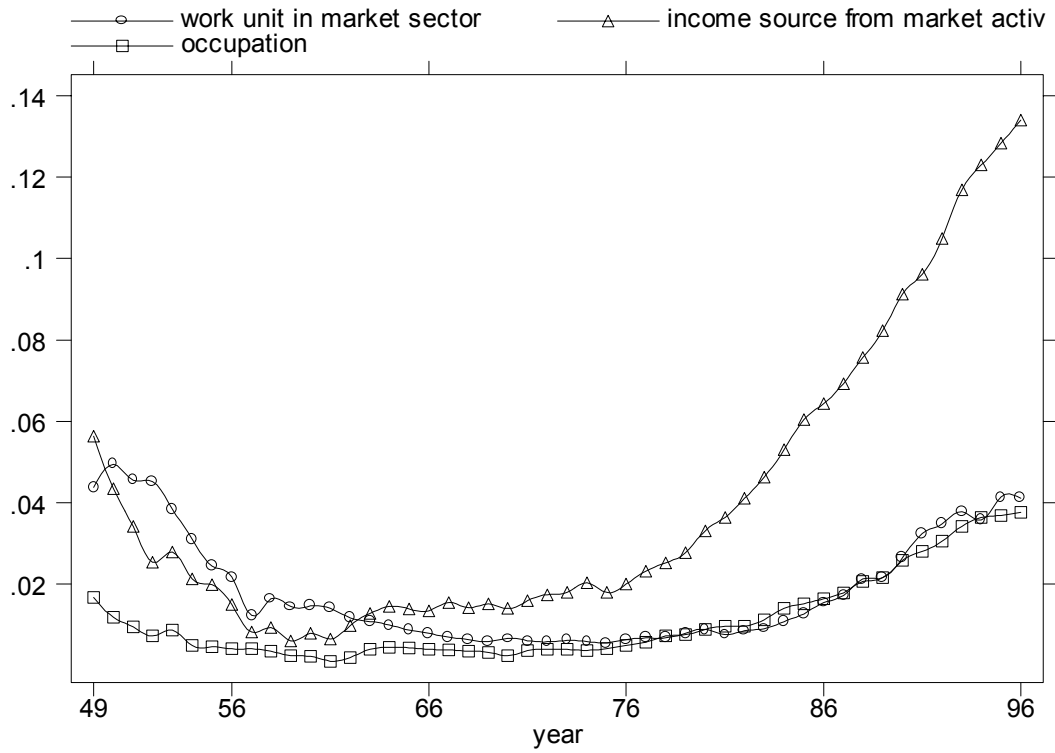


Figure 4. Scatter-plots of Logged Earnings versus Schooling: Voluntary Transition and Involuntary Transition to the Market Sector: Urban China 1996

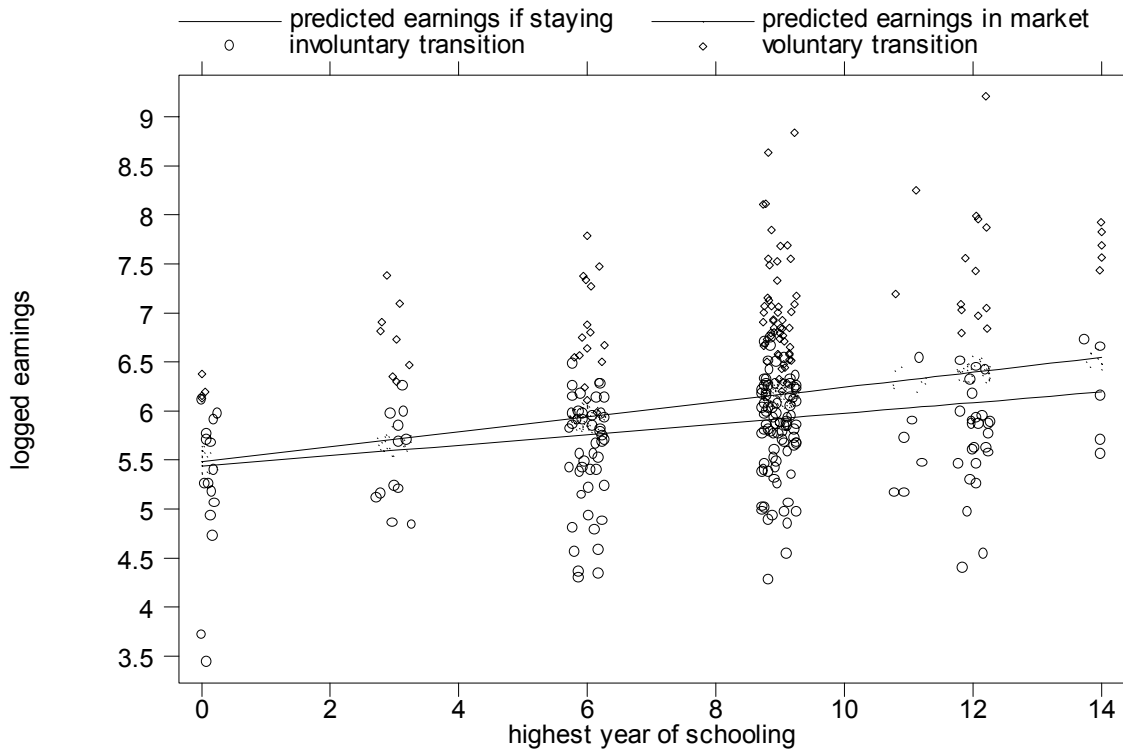
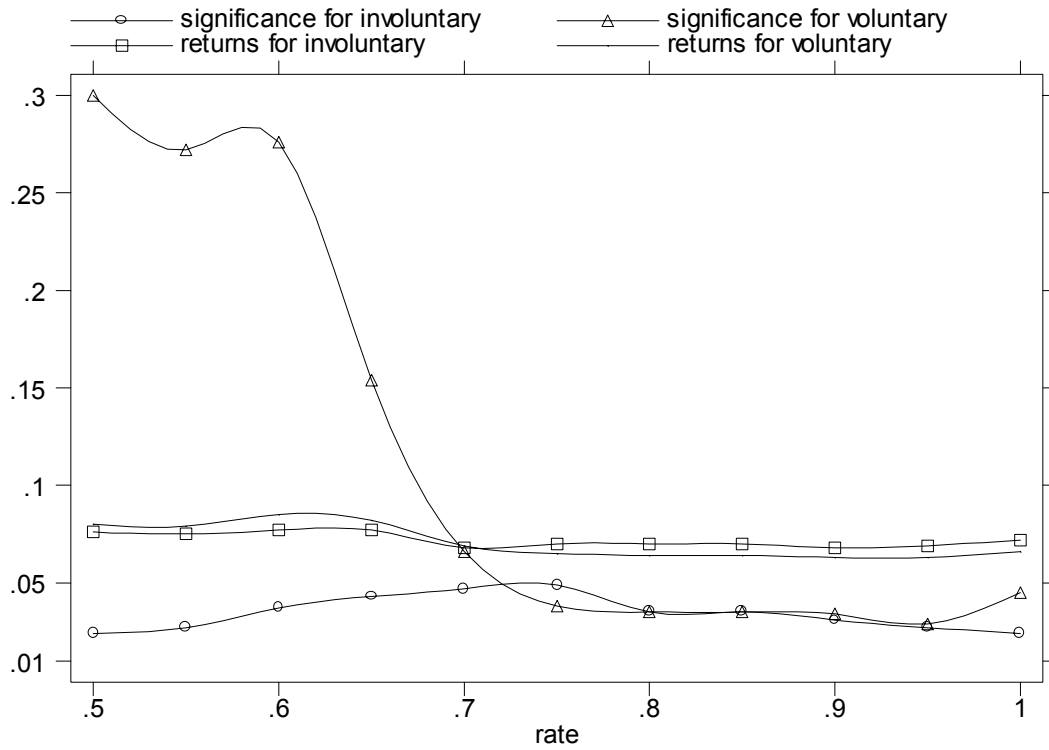


Figure 5. Sensitivity Analysis on the Choice of Different Thresholds in Defining Voluntary and Involuntary Later Entrants



Note: rate is equal to the actual earnings divided by the estimated counterfactual earnings minus 1.

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