DOES THE MARKET PAY OFF? EARNINGS RETURNS TO EDUCATION IN URBAN CHINA

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Previous work on the market transition in reform-era China has missed the direct link between individuals' *labor market history and* individuals' *labor market outcome. A typology of workers is developed based on individuals' labor market histories, and a model of selective mobility of workers from the state sector to the market sector is offered as an explanation for higher earnings returns to education in the market sector. Analysis of data from an urban survey in China reveals that commonly observed higher earnings returns to education in the market sector are limited only to recent market entrants, and that early market entrants resemble state workers in both their level of earnings and returns to education. These results challenge the prevailing wisdom that education is necessarily more highly rewarded in the market sector. Thus it is concluded that higher returns to education in the market sector should not be construed as being caused by marketization per se, and instead that the sorting process of workers in labor markets helps explain the sectoral differentials.*

THE RELATIONSHIP between earnings and education in market economies is well known: Human capital theory explains that a large gradation in earnings by level of 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 2002). Scholars 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; Szelényi 1978, 1983). One of the principal structural changes following the post-socialist transformation has been the gradual replacement of the state by the market as the principal agent of social stratification. This dramatic 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 attributes as determinants of earnings in transition economies (Cao and Nee 2000; Nee 1989, 1991, 1996; Nee and Matthews 1996). This assertion 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; Parish and Michelson 1996; Róna-Tas 1994; Szelényi and Kostello 1996; Walder 1996; Xie and Hannum 1996; Zhou 2000a).

Controversies are mainly focused on whether or not 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" (Hankiss 1990; Róna-Tas 1994; Róna-Tas and Guseva 2001; Staniszkis 1991), have been proposed to account for advantages held by cadres and party members in transition economies.[1] With respect to the changing role of education in social stratification, researchers studying urban China have found the following two results: (1) income/earnings returns to education have increased over time (Bian and Logan 1996; Hauser and Xie forthcoming; Zhou 2000a), and (2) income/earnings returns to education are higher in the market sector than in the state sector (Knight and Song 1993; Wu 2002a; Zhao and Zhou 2002).[2] 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) these two empirical results to market transition per se, even among those who do not accept "the-declining-influence-of-redistribution" thesis. For example, Bian and Logan (1996) state: "[W]e found clear signs of the impacts of market transition. . . . Education, correspondingly, has become more important as a predictor of income" (p. 755). Similarly, Zhou (2000a) 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" (pp. 1166–67). This apparent agreement has led Nee and his associates to claim that the emergence of market institutions has caused "higher returns to human capital than

under a centrally planned economy" (Cao and Nee 2000:1175–76).

Yet the same empirical results are subject to alternative interpretations. Education, be it a proxy for human capital or credentials, was also highly rewarded under the socialist stratification system (Konrád and Szelényi 1979; Szelényi 1988; Walder 1995; Walder, Li, and Treiman 2000). Zhou (2000b: 1192), in his reply to Cao and Nee's (2000) comments, contends that high returns to education could result from the interplay between redistribution and markets. Noting the government's emphasis on human capital in wage policies in the early 1980s, Zhou (2000b) speculates that increasing returns to education in reform-era China may reflect "the compound effects of political processes and marketization" (p. 1193). Without a substantive understanding of how human capital is allocated in the specific institutional context, high returns to human capital cannot be interpreted as being caused by market mechanisms.

We use Zhou's remark as a starting point in our attempt to move beyond the debate framed by Nee's (1989, 1991) market transition theory. By incorporating *individuals*' labor market histories in examining earnings inequality and earnings returns to education among *individual* workers in transitional China, we offer a micro-level perspective on how the process of sorting workers into labor markets shapes labor market outcomes (i.e., earnings). Rather than attributing higher returns to education in the market sector, relative to the state sector, to more efficiently operating market mechanisms, 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's economic reform began in rural areas in 1978 and expanded to urban areas in 1986. The ensuing 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 almost quadrupled, with nearly a 10-percent annual growth rate. The greatest

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[1] For alternative explanations, see Gerber (2000), Lin (1995), and Walder (2002).

[2] However, Gerber and Hout (1998) found that these two patterns do not hold true for Russia between 1991 and 1995.

beneficiaries of this growth and prosperity are the Chinese people, whose living standards have improved significantly. The per capita living space in urban areas has more than doubled during the same period, 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; State Statistical Bureau 1997).

However, not all Chinese have benefited equally from the economic reform. This phenomenal growth in prosperity was also accompanied by sharp increases in income inequality as traditional socialist welfare and security systems were dismantled (Griffin and Zhao 1993; Hauser and Xie forthcoming; Zhao and Zhou 2002). From 1988 to 1995, for example, the Gini coefficient, a common measure of income inequality, increased from .233 to .322 in urban China, and from .338 to .416 in rural China (see a review in Hauser and Xie forthcoming). The image of egalitarian Chinese socialism is no longer the reality (Riskin, Zhao, and Li 2001).

A large body of literature, mostly in economics, has documented the trend of income inequalities in China since 1978 (Adelman and Sunding 1987; Byron and Manaloto 1990; Hsiung and Putterman 1989; Khan et al. 1992; Khan and Riskin 1998; Knight and Song 1993). Sociologists, however, have been more interested in the relocation of individuals 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 been strengthened over time (Hauser and Xie forthcoming; Zhou 2000a; also see summary in Zhao and Zhou 2002, table 2).

To what extent are these observed patterns attributable to marketization per se? The existing literature has been inconclusive so far. For instance, income inequality has experienced a U-shaped trajectory in all former state socialist countries: It declined in the early reform era but increased later. Although some scholars argue that the emer-

gence of market economies brought about the decline (Nee 1989; Szelényi 1978, 1983),[3] it could instead have resulted from the state egalitarian policy which was designed to win support of the working class for the reform (Bian and Logan 1996:755). Increasing returns to education within the state sector (Zhou 2000a), which has been immune to markets until recently, can hardly be attributed to marketization. In addition, economic growth and accompanying changes in the economic structure, rather than markets per se, may account for the increasing returns to political position and entrepreneurship (Walder 2002).

The difficulty in evaluating this issue lies in the operationalization of markets. Xie and Hannum (1996) approximated "marketization" with the regional economic growth rate and found that returns to schooling were negatively associated with marketization.[4] 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 measuring marketization, however, are far from ideal and consequently are subject to criticisms (Walder 1996, 2002).

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

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[3] According to Szelényi (1978, 1983), because the 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 be 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, thereby reducing their income disadvantages in the redistributive hierarchy.

[4] A recent study by Hauser and Xie (forthcoming) 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 in the city where the respondents reside.

in earnings determination may be interpreted as the consequence of marketization. The institutional distinction is commonly drawn between the state sector and the market sector. Higher returns to human capital (e.g., education) in the market sector than in the state sector are regarded as evidence consistent with market transition theory (Cao and Nee 2000; Knight and Song 1993; Nee and Cao 1999; Tang and Parish 1999; Wu 2002a). Characterizing workplace (*danwei*) with finer measures of distance to the market (i.e., government agencies, public organizations, central government firms, local government firms, collective firms, and hybrid/private firms) is another way to assess the extent to which marketization has affected workers' earnings (Zhou 2000a).

Although data on these sector-based or workplace-based measures are relatively easy to collect and the idea is theoretically appealing, this approach overlooks the fact that labor markets, if assumed to be in operation, are fluid at the local level. That is to say, the sorting of workers into different sectors/workplaces is unlikely to be exogenous, especially between the state sector and 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 nonstate economy, resulting in the gradual shrinkage of the state sector (Lin, Cai, and Li 1994; Qian 1999). In this light, the primary thrust in the economic transition has come from the growth of the new private and semiprivate sectors that have gradually caught up with, and may eventually overtake, the state sector. Consequently, in a mixed economy like China's, the mobility of workers from the state sector to the market sector is an integral part of the multifaceted process of market transition (Gerber 2002a). The labor market sorting process accordingly could exert a great impact on labor market outcomes such as earnings inequality.

Participants in the market transition debate (see the Symposium on Market Transition in the *American Journal of Sociology,* vol. 101, no. 4) have so far paid inadequate attention to the labor market itself—the central institution thought to be directly responsible for generating income inequalities. While re-searchers have chosen to analyze income/earnings as a key outcome measure, the labor market as the concrete institutional context remains elusive (Gerber 2002a). In examining changing patterns of income/earnings distribution, we must explicitly account for the changing scope of labor market conditions and its consequences for individual workers.

Moreover, in addressing the central question in the debate on who wins and who loses in the market transition, 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 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 Szelényi and Kostello (1996) point out, whether 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 elites are losers on the sideline. Hanley's (2000) study shows that self-employment (in the market) in post-Communist Eastern Europe encompassed two distinct class locations: the individually self-employed on one hand, and employers on the other. Only employers enjoy significant advantages in income. In post-Soviet Russia, the situation is different: Both individually self-employed and employers in the market sector have higher earnings (Gerber 2002b). In the late 1980s in urban China, dual labor markets operating with different reward systems seriously distorted earnings returns to education among Chinese workers. An egg-cake vendor's daily earnings could surpass a university professor's monthly salary, mainly because the reward system for the professor was rigid and limited in the redistributive economy (Li 2002; Zhao 1993). Within the state sector, returns to education were 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 more opportunities for workers to move into the market sector. Thus, the winners or losers of the market transition are not defined until we take into account the 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 China in the mid 1980s have shown that most private entrepreneurs and individual business owners (*getihu*) were migrant peasants, unemployed youth, dismissed workers, former criminals released from prisons, and retirees (Davis 1999; Gold 1990; Li 1993: 323–30). Zhou, Tuman, and Moen (1997) report minimal mobility from the state sector to the market sector in urban China, especially among those with high human capital. These results support Szelényi and Kostello's (1996) argument that in early stages of economic reform entrants to the market sector tended to be those in the low tiers of the social hierarchy who were not at risk of losing privileges like those enjoyed by workers in the state sector.

However, as marketization proceeded and risks in the market were further reduced, workers with more marketable skills began gradually switching to the market sector to grasp the new opportunities there. Communist cadres also learned to embrace the market to cash in their political and social capital. In the face of competition from these groups "with more to lose but also more to gain," the early market pioneers were marginalized or even wiped out in certain situations (Szelényi and Kostello 1996: 1089). In China since 1992, waves of professionals and government officials have entered the market—or "jumped into the sea" (*xiahai*). According to an estimate, in the single year of 1992, more than 120,000 cadres resigned from their posts in the government and joined in the market (Chen 1993).

As a result, workers in the market sector include both those who entered early and those who entered late; these two groups may differ significantly in background and earning power. Although early entrants are likely to have low human capital and political capital, cadre and professionals who voluntarily chose to give up their "iron rice bowls" tended to have a good education and/or to possess the political capital to secure advantages in the market. Pooling these two very different groups creates a heterogeneous body of workers in the market sector 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 the process of how workers are sorted into the market sector. In our view, many of the controversies in the current literature are rooted in inattention to individual workers' mobility experience across sectors in China's mixed economy. Thus, our main purpose here 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 preceding discussion makes clear the need 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 dichotomize all workers in the urban labor force into two groups: those in the state sector and those in the market sector. This measurement follows the common practice in the literature and thus allows us to compare our results with those reported in previous studies. We then apply the same measurement to characterize workers' past histories in terms of sector location. Combining information pertaining to a worker's sector status at two points in time, we obtain a two-by-two table that cross-classifies four types of workers, as shown in Table 1.

The first type characterizes workers who were in the state sector initially and have

Table 1. Typology of Workers in Labor Market Transition

Initial Sector	Current Sector	
	State Sector	Market Sector
State Sector	Type I (Stayers)	Type II (Later entrants)
Market Sector	Type III (Market losers)	Type IV (Early birds)

stayed 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. The third type ("market losers") includes those who initially were in the market sector but later retreated to the state sector. Given that mobility is generally a one-way transition from the state sector to the market sector in reform-era China, very few workers belong to this category. The last type ("early birds") consists of those who entered the market early and have stayed there.

The commonly observed finding of higher returns to education in the market sector than in the state sector is subject to two possible explanations. First, the market sector may allocate and reward human resources more efficiently than does the state sector. If this is the case, then both early birds and later entrants should enjoy relatively higher returns to education than those in the state sector, because all workers in the market sector are subject to the same market mechanisms. Hence, we can test the following hypothesis:

Hypothesis 1: Earnings returns to education are higher for both later entrants and early birds than for stayers.

Alternatively, a distinctive boundary can be drawn on the basis of the reform stage during which workers entered the market sector. Although early birds might benefit from the economic reform and marketization in the early stage, they were "pushed aside or wiped out altogether" in the later stage as better qualified workers (with more human and/or political capital) entered the market (Szelényi and Kostello 1996:1091). In the meantime, the earnings regime in the state sector was also altered substantially in response to market expansion. For instance,

since the late 1980s in urban China, government policies have placed more emphasis on educational credentials in job assignments and promotions; state firms have increased cash wages rewarding human capital in order to retain productive workers. These co-evolutionary changes within both sectors suggest a trend toward convergence in earnings regimes in urban China (Zhou 2002a). In other words, the earnings of stayers in the state sector were gradually catching up with those of workers in the market sector. Given this convergent trend, workers with good and secured positions in the state sector would not want to voluntarily move to the market sector (*xiahai*) unless the potential payoff there is very large. In contrast, many low-skilled workers in the state sector did not have an option and were simply pushed to the market sector through layoffs (*xiagang*). Because of these selective mechanisms, we may observe higher earnings and higher returns to education only among later entrants to the market sector. Thus, we propose an alternative hypothesis:

Hypothesis 2: Later entrants, but not early birds, enjoy higher earnings returns to education than stayers.

The crucial difference between the two hypotheses is the treatment of early birds. In Hypothesis 1, early birds are grouped with later entrants because they share the common feature of being in the market sector. This sets them apart from stayers in the state sector. In Hypothesis 2, early birds are grouped with stayers because the two types of workers were approaching a convergence, against which later entrants were selectively recruited into the market sector. If empirical evidence rejects Hypothesis 1 in favor of Hypothesis 2, then the state-market disparity in returns to education can hardly be at-
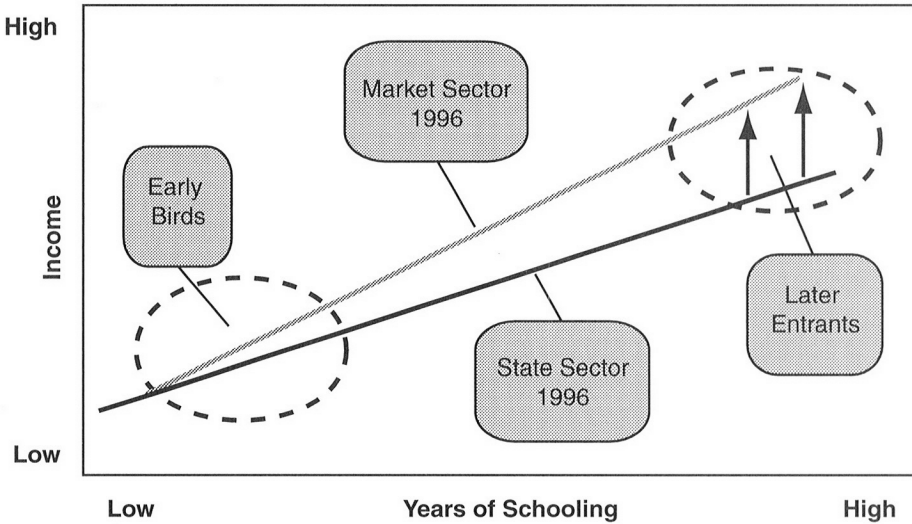
Figure 1. Labor Market Transition and Returns to Education in China: Illustrative Diagram

Note: The dotted oval in the lower left represents the area where early birds tend to be concentrated, exhibiting little difference in average earnings compared with workers in the state sector with equivalently low education. The dotted oval in the upper right represents the area where later entrants tend to be concentrated. The arrows denote a significant difference in average earnings between highly educated later entrants and highly educated workers in the state sector.

tributed to market mechanisms. Instead, the sorting process of market entrants and the resulting heterogeneity of workers in the market sector, as described above, may help explain the differential.

We illustrate our alternative Hypothesis 2 graphically in Figure 1, where the two lines represent the education-earnings relationship in the state sector and the market sector, respectively. Early birds tend to be concentrated in the lower-left end of the graph (i.e., relatively lower education and lower earnings), whereas a large portion of later entrants is concentrated in the upper-right corner of the graph (i.e., relatively higher education and higher earnings). Combining early birds and later entrants would thus make returns to education appear higher (a steeper slope) for workers in the market sector as a single group than for workers in the state sector.

DATA, VARIABLES, AND MODELS

DATA

Our empirical analyses are based on the 1996 survey of "Life Histories and Social Change in Contemporary China," a multi-stage stratified national probability sample of 6,090 adults aged 20 to 69 from all regions of China (except Tibet). The survey gathered extensive information on respondents' life histories and job activities. Samples from rural and urban areas were drawn separately, yielding 3,003 rural cases and 3,087 urban cases (Treiman 1998, app. 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 the urban subsample those who were not active in the labor force at the time of the survey, we had 2,079 respondents for the following analyses.

We investigate the outcomes of labor market transitions in the period between 1987 and 1996. We select 1987 as the benchmark year because the urban economic reform was initiated in 1986. Prior to 1986, the private economy and labor markets were almost nonexistent, and few workers had transferred from the state sector to the market sector. Thus, in operationalizing the typology of Table 1, we use 1987 as the year of a worker's initial sector and 1996 as the year of the worker's current sector.

VARIABLES

Distinguishing the market sector from the state sector is crucial to the typology of workers proposed in Table 1. Given the fact that the boundary between the sectors is fluid in a transition economy, results may be sensitive to how the market sector is operationalized. Hence, we construct three measures of the market sector, using information pertaining to the respondent's occupation, main source of income, and affiliated work organization.

We begin with a conservative measure restricting the market sector to self-employed workers. Self-employment in China takes two forms: individual family business and private enterprises.[5] Using the respondent's occupation, we code "individual family business owner" (*getihu*) and "private enterprise owner" (*siying qiye zhu*) as being self-employed and thus working in the market sector. We call this operationalization the "restrictive measure" of the market sector.

In our view, however, the restrictive measure is too narrow, as workers may participate in market activities without necessarily becoming an "individual family business owner" or "private enterprise owner." For example, someone may still keep a nominal position in a state-owned firm but be fully engaged in a private business on the side (Davis 1999). We thus broaden our operationalization of the market sector by incorporating information about the respondent's main source of income.

That is, we code as being self-employed those respondents whose main source of income is from "running a business," an "independent occupation" (*ziyou zhiye*), or "helping family member's business."[6] As a result,

we construct the "broad measure" that classifies respondents as working in the market sector if they are self-employed according to either occupation or main source of income.

One of the implications of Nee's (1989) market transition theory is that human capital is rewarded more highly among workers in the market sector than among workers in the state sector, because market mechanisms should dictate a rational and efficient allocation of resources based on workers' productivity rather than their political loyalty. Several previous studies have tested this proposition (e.g., Cao and Nee 2000; Tang and Parish 1999; Wu 2002a; Zhao and Zhou 2002; Zhou 2000a). To make our results comparable, we further expand our operationalization of the market sector to incorporate employees in nonstate firms: "corporate enterprises," "domestic private enterprise," "joint ventures," and "foreign-invested firms." This expansion results in a more general operationalization, called the "comprehensive measure," according to which the self-employed and employees of nonstate firms constitute the market sector.[7]

In sum, we operationalize the market sector in three different ways that are progressively more inclusive. According to the restrictive measure, only self-employed workers by occupation (*getihu* and *siying qiye zhu*) are defined as working in the market sector. The broad measure adds to that group other workers whose main source of income is derived from market activities. The comprehensive measure further includes employees in nonstate firms. Hence, from the first measure to the third measure, we expand the boundary of the market sector. We use all three measures in our subsequent analyses and examine whether or not they yield similar results.

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[5] According to the Chinese government's classification, privately owned businesses with fewer than eight employees are registered as *getihu*, whereas businesses with eight or more employees are registered as "private enterprises" (*siying qiye*) (Gold 1990:163).

[6] This group is dominated by the first category—"running a business"—with only a few cases falling in the second and third categories. For example, in 1996, there were only 2 cases in the second category ("independent occupation") and 17 cases in the third category ("helping family member's business"), compared with 377

cases in the first category. Both "individual family business owners" and "private enterprise owners" belong to the first category.

[7] Gerber's (2002b) analysis of Russia shows that all workers in the Russian private sector, regardless of whether they are self-employed or employees, enjoy higher earnings than do employees in the state sector, with self-employed workers having an additional advantage. In an early version of our paper, we conducted a separate analysis for employed workers only and found similar results.
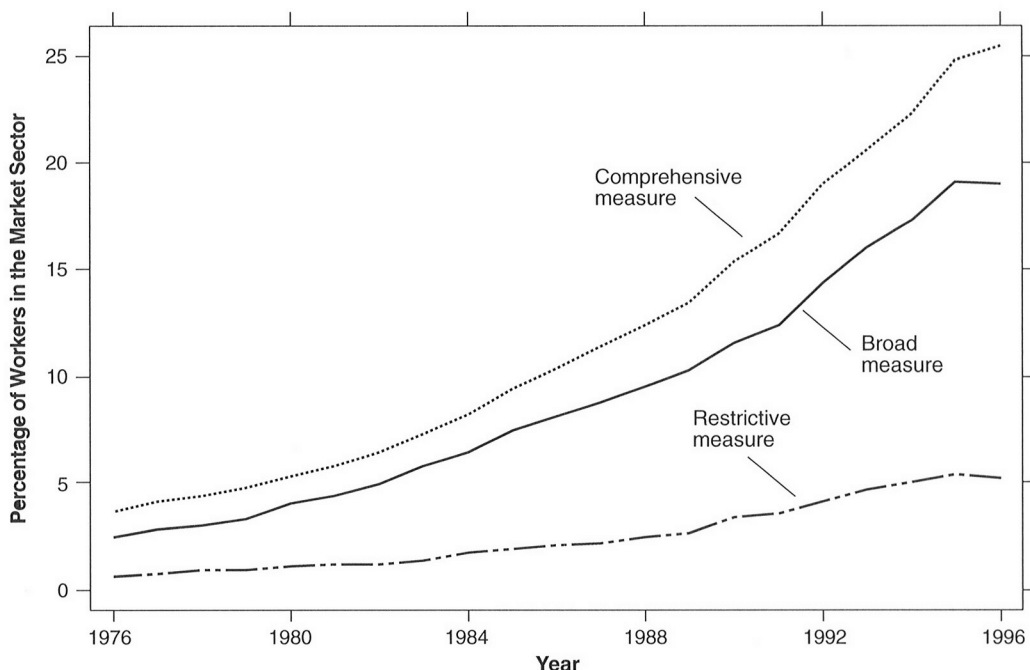
Figure 2. Percentages of Urban Workers in China's Market Sector, 1976 to 1996: A Comparison of Three Measures

In Figure 2, we present the percentage of workers in the market sector separately by measure, from 1976 to 1996. The historical trend displayed is a familiar one: Self-employment was essentially nonexistent when the market-oriented economic reform started; as the market transition proceeded, the share of workers in the market sector, by all three measures, increased substantially beginning in the mid-1980s. In 1996, the percentage of workers in the market sector was 5 percent, 19 percent, and 26 percent, respectively, according to the three different measures.

Our dependent variable is the sum of monthly earned income, including regular wages, bonuses, subsidies, or profits from market businesses. For most respondents, we use monthly earnings from a job (averaged over the preceding year), measured in RMB yuan (1 yuan = U.S. $.12). For nonwage-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 then by 12 months. We take the logarithm of monthly earnings as our dependent variable in multivariate analyses.

MODELS

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

$$\log(Y) = \beta_0 + \beta_1 Education + \beta_2 Experience + \beta_3 Experience^2 + \beta_4 Party + \beta_5 Sex + \varepsilon, \tag{1}$$

where ε represents the residual unexplained by the baseline model, and the β parameters are regression coefficients measuring returns to respective independent variables. Education, a continuous variable, is measured by 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 include a square term of work experience. Party membership is coded as a dummy variable (yes = 1), as is sex (male = 1).

Table 2. Summary Statistics (Means and Standard Deviations) for Variables in the Regression Analysis of Earnings Returns to Education in Urban China, 1996

Variable	Monthly Income		Education (Years of Schooling)	Work Experience (in Years)	Party Member (Yes = 1)	Sex (Male = 1)	Number of Cases
	In Yuan	Logged					
Overall [a]	564.4	6.07	9.51	21.00	.17	.57	2,079
	(727.7)	(.67)	(3.38)	(10.97)			
State sector in 1996	487.2	6.05	9.98	21.18	.22	.58	1,547
	(308.3)	(.55)	(3.32)	(10.62)			
Stayers	486.3	6.04	10.00	21.24	.22	.57	1,528
	(307.6)	(.55)	(3.31)	(10.64)			
Market losers	559.2	6.15	8.26	16.11	.05	.68	19
	(359.6)	(.62)	(3.68)	(7.99)			
Market sector in 1996	789.0	6.13	8.15	20.49	.03	.56	532
	(1,314.4)	(.94)	(3.20)	(11.90)			
Later entrants	769.4	6.18)	8.22	18.20	.03	.51	337
	(1,080.9)	(.90	(3.22)	(11.87)			
Early birds	822.9	6.05	8.02	24.45	.03	.64	195
	(1,644.2)	(1.01)	(3.17)	(10.91)			

Source: Survey of "Life Histories and Social Change in Contemporary China," adults aged 20 to 69, 1996.

Note: Numbers in parentheses are standard deviations.

[a] Based on the comprehensive measure of the market sector.

To measure earnings differences by sector, we add to equation 1 a dummy variable, *Sector*, to denote whether the respondent is in the market sector (yes = 1). The coefficient β_6 in equation 2 indicates the sectoral difference in earnings:

$$\log(Y) = \beta_0 + \beta_1 Education + \beta_2 Experience + \beta_3 Experience^2 + \beta_4 Party + \beta_5 Sex + \beta_6 Sector + \varepsilon. \quad (2)$$

To further allow returns to education to vary by sector, we fit a model with an interaction term between *Education* and *Sector* for 1996:

$$\log(Y) = \beta_0 + \beta_1 Education + \beta_2 Experience + \beta_3 Experience^2 + \beta_4 Party + \beta_5 Sex + \beta_6 Sector + \beta_7 Sector \times Education + \varepsilon, \quad (3)$$

where β_6 indicates the earnings difference by sector when education is zero, and β_7 denotes the difference in returns to education between the sectors.

Our analytical strategy calls for a comparison of earnings regimes not only between the sectors but also across the worker types shown in Table 1. We thus modify equations 2 and 3 to:

$$\log(Y) = \beta_0 + \beta_1 Education + \beta_2 Experience + \beta_3 Experience^2 + \beta_4 Party + \beta_5 Sex + \beta_{6j} Type_j + \varepsilon, \quad (4)$$

$$\log(Y) = \beta_0 + \beta_1 Education + \beta_2 Experience + \beta_3 Experience^2 + \beta_4 Party + \beta_5 Sex + \beta_{6j} Type_j + \beta_{7j} Type_j \times Education + \varepsilon, \quad (5)$$

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. In equation 4, β_{6j} denotes the overall difference in earnings by worker type; in equation 5, β_{6j} and β_{7j} denote, respectively, the intercept and slope differences by worker type.

Because the sample was clustered within 50 city districts or counties (see details in Treiman 1998), an adjustment of standard errors is needed in regression analyses. All the models reported were estimated using Stata 7.0, with robust standard errors cor-
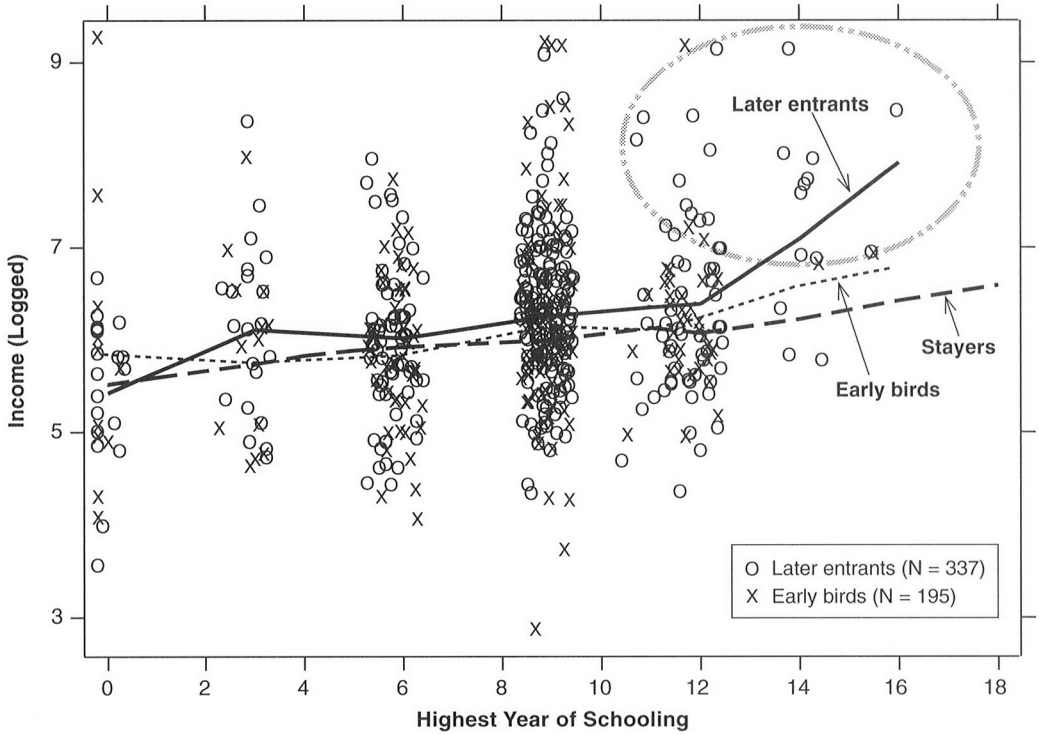
Figure 3. Scatterplot of Logged Income by Years of Schooling for Early Birds, Later Entrants, and Stayers: Urban China, 1996

Note: To more clearly display the distributions for early birds and later entrants, stayers (N = 1,528) are omitted from the scatterplot. The smoother line for stayers, however, is shown. Smoother lines show the fitted values by lowess (LOcally WEighted Scatterplot Smoother) procedure (see Fox 1997:417–24).

The dotted oval in the upper right represents the area in the plot encompassing respondents with high income and high education. Note that most respondents in this area are later entrants.

rected for clustering on sampling units (districts/counties) (Stata Corporation 2001). The data were appropriately weighted to represent the Chinese general population.

RESULTS

DESCRIPTIVE STATISTICS

Table 2 presents the descriptive statistics for the variables used in our analysis, by current sector and worker type, based on the comprehensive measure. Of the 2,079 workers sampled from the urban labor force, 1,547 were in the state sector and 532 were in the market sector in 1996. For workers in the state sector, the majority started their first jobs in the state sector and stayed there, while only 19 transferred from the market sector. As expected, mobility from the market sector to the state sector was rare.

Among those workers in the market sector, 195 workers entered early and stayed there, while 337 transferred to the market sector after 1987. Comparing earnings across the four types of workers yields an interesting result: It is only later entrants, not early birds, who have a significant earnings advantage over stayers ($t = 3.58, p < .001$).

Figure 3 presents scatterplots for logged income by years of schooling, with nonparametric lowess smoother lines imposed by worker type. The lines for early birds and stayers are very similar to each other, while the line for later entrants becomes steeper as schooling moves beyond 12 years. We observe that the cases in the upper right zone (see oval), representing workers with high education and high earnings, are predominantly later entrants (indicated by circles). This pattern is consistent with our theoretical speculation presented in Figure 1. The

Table 3. OLS Coefficients from the Multiple Linear Regression of Monthly Earnings on Selected Independent Variables, Urban China, 1996: Two-Sector Analysis

Variable	Baseline Model 1	Restrictive Measure		Broad Measure		Comprehensive Measure	
		Model 2a	Model 3a	Model 2b	Model 3b	Model 2c	Model 3c
Education (years of schooling)	.046*** (.010)	.052*** (.007)	.048*** (.008)	.052*** (.008)	.044*** (.009)	.055*** (.007)	.045*** (.007)
Experience	.011* (.004)	.011** (.004)	.011** (.004)	.010* (.004)	.008 (.004)	.012** (.004)	.010*** (.004)
(Experience)^2 × 1,000	−.175* (.079)	−.141 (.072)	−.126* (.068)	−.165* (.075)	−.093 (.070)	−.185* (.077)	−.127* (.072)
Party member (yes = 1)	.099* (.044)	.115** (.041)	.120** (.040)	.136*** (.035)	.143*** (.035)	.147*** (.037)	.155*** (.037)
Sex (male = 1)	.232*** (.042)	.216*** (.039)	.211*** (.038)	.223*** (.039)	.213*** (.040)	.220*** (.039)	.211*** (.040)
Sector (market = 1)	—	.399 (.231)	−.433 (.359)	.209 (.111)	−.223 (.170)	.247* (.114)	−.161 (.181)
Market sector × Education	—	—	.101 (.052)	—	.052** (.019)	—	.048** (.015)
Constant	5.342*** (.162)	5.231*** (.112)	5.276*** (.120)	5.253*** (.136)	5.347*** (.147)	5.169*** (.102)	5.282*** (.110)
R^2	.098	.120	.133	.112	.121	.121	.130

Notes: Numbers in parentheses are robust standard errors adjusted for clustering on counties. Data are weighted; N = 2,079.

*$p < .05$ **$p < .01$ ***$p < .001$ (two-tailed tests)

distinct economic achievement by this part of later entrants could contribute to the higher returns to education for later entrants as a group, as well as for the entire body of workers in the market sector.

REGRESSION RESULTS

In Table 3, we report the ordinary least squares (OLS) regression estimates for seven models of earnings determination. Model 1 is a baseline model, with education, work experience and its square term, party membership, and sex included as predictors (equation 1). All the predictors have significant effects on earnings. The rate of returns to education is about 4.7 percent ($e^{.046}$–1), slightly higher than previous estimates (Byron and Manaloto 1990; Hauser and Xie forthcoming; Walder 1990; Xie and Hannum 1996).[8] Party members enjoy an 11-percent

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[8] To check the linearity specification for the education effect, we fitted a new model in which education is coded at 5 distinct levels (1 = pri-

($e^{.099}$ – 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 a peak at about age 31. Sex difference in earnings is also estimated to be large, with men earning 26 percent ($e^{.232}$ – 1) more than women, other things being equal.

In Models 2a and 3a of Table 3, we compare the earnings regimes between the state sector and the market sector, based on the restrictive measure. Model 2a is an additive model with sector included as a dummy variable (equation 2). It shows that workers in the market sector earn 49 percent ($e^{.399}$ – 1) more than their counterparts in the state sector (this result approaches statistical significance at $p < .10$). Adding an interaction term

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mary school or below; 2 = junior high school; 3 = technical school; 4 = senior high school; 5 = college or above). The F-test statistic for the two nested models is nonsignificant at .88 with 3/2,070 degrees of freedom, suggesting that the linearity specification is acceptable.

Table 4. OLS Coefficients from the Multiple Linear Regression of Monthly Earnings on Selected Independent Variables, Urban China, 1996: Three-Worker-Type Analysis

Variable	Restrictive Measure		Broad Measure		Comprehensive Measure	
	Model 4a	Model 5a	Model 4b	Model 5b	Model 4c	Model 5c
Education (years of schooling)	.049*** (.009)	.045*** (.010)	.053*** (.008)	.045*** (.009)	.057*** (.007)	.047*** (.006)
Experience	.010** (.005)	.009* (.005)	.010* (.004)	.008 (.005)	.014*** (.004)	.013*** (.004)
(Experience)^2 × 1,000	−.153* (.074)	−.144* (.070)	−.160* (.074)	−.099 (.070)	−.203** (.070)	-0.167** (.060)
Party member (yes = 1)	.121** (.038)	.126** (.037)	.138*** (.035)	.145*** (.035)	.142*** (.037)	.149*** (.037)
Sex (male = 1)	.218*** (.040)	.213*** (.040)	.220*** (.038)	.210*** (.039)	.225*** (.038)	.216*** (.038)
Later entrants[a]	.312* (.144)	−.732 (.370)	.238*** (.068)	−.263 (.193)	.313*** (.071)	−.175 (.182)
Early birds	.553 (.439)	.130 (.602)	.184 (.230)	−.124 (.266)	.151 (.206)	−.067 (.249)
Later entrants × Education	—	.122* (.047)	—	.060* (.022)	—	.056** (.019)
Early birds × Education	—	.051 (.103)	—	.037 (.031)	—	.025 (.024)
Constant	5.305*** (.156)	5.348*** (.165)	5.238*** (.140)	5.333*** (.153)	5.124*** (.106)	5.230*** (.116)
Number of cases	2,072		2,061		2,060	
R^2	.117	.129	.114	.123	.127	.136

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

[a] "Stayers" is the reference category; market losers are omitted from the analysis because of the small number of cases (N = 19).

*p < .05   **p < .01   ***p < .001 (two-tailed tests)

between sector and education, Model 3a examines differential returns to education between the two sectors (equation 3). The positive coefficient for the interaction term also approaches statistical significance ($p < .10$), suggesting that returns to education might be higher in the market sector than in the state sector. One additional year of schooling increases earnings by 16.1 percent ($e^{.101 + .048} - 1$) for workers in the market sector, but only 4.9 percent ($e^{.048} - 1$) for workers in the state sector, holding constant the other factors. Note that the intercept term for sector is estimated to be negative and is not significantly different from zero in this model. This means that the advantage of working in the market sector, observed in Model 2a, is true only at the upper end of the education distri-

bution because of higher returns to education in the market sector than in the state sector.

Replacing the restrictive measure of the market sector with two alternatives—the broad measure and the comprehensive measure, we replicate the preceding analysis and report the results in the final four columns of Table 3. The qualitative conclusion remains the same. The only notable change is that the interaction term between education and sector is smaller in magnitude (about halved) but attains a higher statistical significance in these models. Thus, with different specifications of the sectoral boundary of the market, results in Table 3 consistently confirm the prevailing wisdom that workers in the market sector enjoy higher returns to education than do workers in the state sector.

However, it would be premature to conclude from these results that the market sector utilizes human resources more efficiently. The higher earnings returns to education in the market sector than in the state sector could be caused by the sorting process of workers and the resulting heterogeneity in labor markets, rather than by market mechanisms per se. To examine this issue, we disaggregate workers into three types based on their labor market histories, as specified in Table 1 (omitting the 19 market losers). Model 4a and Model 5a of Table 4 are based on the restrictive specification of the market sector. Model 4a is an additive model that only allows the intercepts to vary by worker type (equation 4). Results show that, among workers in the market sector in 1996, *only* later entrants enjoyed significantly higher earnings than did those who stayed in the state sector, by 37 percent ($e^{.312} - 1$).

Later entrants' advantage is limited to those workers with high levels of education, as shown in Model 5a, which allows returns to education to differ across the three types of workers (equation 5). The coefficient of the interaction term between worker type and education represents the difference in returns to education by worker type. Results of Model 5a indicate that later entrants have higher returns to education. Other things being equal, an additional year of schooling increases their earnings by 18.2 percent ($e^{.122 + .045} - 1$), compared with a return rate at 4.6 percent ($e^{.045} - 1$) for workers staying in the state sector ($p < .05$). Although early birds also work in the market sector, their earnings trajectory is no different from that of stayers in terms of both the intercept and slope coefficients of education. This evidence rejects Hypothesis 1 in favor of Hypothesis 2.

To ensure the robustness of this finding, we replicate equations 4 and 5 using the broad measure and comprehensive measures of the market sector and present the results as Models 4b and 5b, and Models 4c and 5c, respectively. According to Model 4b, later entrants' earnings are 27 percent ($e^{.238} - 1$) higher than those of workers staying in the state sector, other things being equal ($p < .01$). Again, this advantage is entirely attributable to later entrants' higher rate of returns to education compared with that of stayers

(11.1 percent versus 4.6 percent). The results of Models 4c and 5c are similar to those of Models 4b and 5b.

Our findings suggest that the commonly observed higher earnings and higher returns to education in the market sector compared with the state sector in China are due entirely to the earnings outcomes of later entrants. Early market entrants resemble workers in the state sector in both their level of earnings and returns to education. Thus, it appears that it is not the market per se that renders higher rewards to later market entrants. Otherwise, early birds would enjoy an advantage similar to later entrants. Furthermore, the three different ways of operationalizing the market sector variable yield essentially the same conclusion, although the magnitude of the sectoral difference in returns to education does vary. The advantage of later entrants is estimated to be higher, albeit with larger standard errors, with the restrictive measure than with the other two measures. It seems that the restrictive measure is more conservative and captures a more homogenous group, but it classifies a much smaller number of workers as being in the market sector.

DISCUSSION

To summarize, we found that past labor market experience distinguishes workers within the Chinese market sector, with the earnings advantage of the market sector being limited to later entrants only. We suspect that two different institutional processes in urban China may have contributed to this phenomenon. On one hand, a growing number of qualified workers voluntarily gave up their career opportunities in the state sector and entered the market, or "jumped into the sea" (*xiahai*) (Wu 2002b). On the other hand, an increasing number of workers were laid off by ailing state enterprises and thus "pushed" into the market (*xiagang*) (Lee 2000; Solinger 2002). Due to the different selection mechanisms, the two subgroups could be very different from each other in observed and unobserved characteristics. Whereas the former may be associated with higher education and higher earnings potential, the latter is likely associated with lower education and lower earnings potential in the

market. Pooling them would yield higher returns to education for later market entrants as a single group.[9]

Of the two institutional processes for entering the market sector, it appears that voluntary entry plays a more important role as of 1996, since later entrants' earnings advantages can largely be attributed to a group of high earners who are also highly educated (see the upper-right zone of Figure 3).[10] This may reflect the changing opportunity structure in the market sector. With the proceeding of marketization, especially in the 1990s, the development of real estate and financial markets afforded more lucrative opportunities that attracted cadres and professionals (Wu 2000b). Hence, under varying institutional circumstances, workers of different backgrounds were likely to end up in different parts of the market sector, which may contribute to the observed earnings inequality and differential returns to education.

Our findings suggest that past research based on simple sectoral comparisons can be misleading. Although we recognize the crucial importance of institutional structures in determining social stratification, sectoral differences in economic returns to education could result from the sorting mechanisms of workers into a sector, rather than the institutional nature of the sector per se (also see Róna-Tas and Guseva 2001:648). Thus, without critically examining the concrete labor market conditions, imputing institutional significance from the sectoral differences in returns to education is unwarranted. In this context, we recall Sørensen's (1996:1334) distinction between two types of structural effects on inequality: (1) those that reflect the characteristics of incumbents of social positions, due to sorting processes, and (2) those attributable to the characteristics of social positions per se. Our argument is that

the higher return to education in the market sector relative to the state sector is essentially an example of the first type of structural effect, rather than the second type. That is, the higher return to education is not caused by the market per se, but is associated with the characteristics of workers in the market sector.

CONCLUSION

Previous studies on the market transition in socialist and post-socialist societies have missed the direct link between *individuals'* labor market histories and *individuals'* labor market outcomes. In this paper, we have developed a typology of workers based on their job histories. We proposed a model of selective mobility of workers from the state sector to the market sector and derived a competing hypothesis in regard to earnings returns to education. Although our analyses confirm the prevailing wisdom that earnings returns to education are higher in the market sector than in the state sector, we do not find any difference between early birds in the market sector and stayers in the state sector. The observed advantage of workers in the market sector is limited to later market entrants only.

These results cast doubt on the proposition that higher returns to education in the market sector than in the state sector are caused by marketization per se. Instead, they suggest that the difference is attributable to the process of how workers are sorted into the market sector and the resulting heterogeneity of workers over the course of marketization. Hence, we conclude that the shift from redistributive to market economies is a complicated social process that defies simplistic characterizations concerning the change of relative returns to human capital. We call for a better understanding of the dynamic processes of social actors during market transition.

An implication of our conclusion is that the state and market institutions do not differ in how they reward human capital. This seemingly bold statement can be interpreted within the broader literature on education and inequality. Comparative studies have shown that education assumes a universally important role in social stratification in all

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[9] Because our data do not contain a direct measurement of respondents' motivations for making labor market transitions (i.e., whether they "jumped" or were "pushed" into the market), we are unable to test this variable and leave it as an open question for future investigation.

[10] We created a dummy variable for highly educated later entrants (with vocational school education or above). After including this dummy variable, we no longer observe an advantage among later entrants for all the models in Table 4.

modern societies, be they socialist or capitalist (Shavit and Blossfeld 1993). Although "dual labor market" theorists have argued that labor markets in capitalist economies can be separated into two fundamentally different sectors (primary versus secondary) (Althauser and Kalleberg 1981; Beck, Horan, and Tolbert 1978; Hodson and Kaufman 1982), empirical studies have found no real sectoral differentials in income/wage determination in the United States, particularly in terms of returns to human capital (e.g., Sakamoto and Chen 1991; Zucker and Rosenstein 1981). Thus it has been suggested that "work on dual economy needs to be reconsidered, and some reformulation is necessary" (Zucker and Rosenstein 1981:880). We believe that scholars studying inequality in socialist and post-socialist societies should also take this advice and examine concrete institutional parameters within the state sector or the market sector, rather than presuming the state/market sectoral dichotomy and attributing the sectoral differentials to abstract "market forces." As Walder (1996) puts it: "Markets per se are not the issue. What matters are the variable institutions and conditions that define markets, and our theory and research must put them at center stage" (pp. 1060–61). Only through understanding the actual processes of labor markets in generating social inequalities can we gain cumulative knowledge about the social consequences of market transition. We hope that our research is a small step in this direction.

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