

**FOREIGN DIRECT INVESTMENT AND DISSEMINATION OF
JOB OPENING INFORMATION IN CHINA***

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ACRONYMS

FDI	foreign direct investment
SOE	state-owned enterprise
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
WTO	World Trade Organization

1 INTRODUCTION

The latest population census conducted in November 2000 in China revealed that the economically active population had reached 711.5 million. An estimation of as high as 25 percent of this labor force is redundant (including disguised unemployment). Although urban workers are only 30 percent of this labor force, while the rest is rural labor, the employment of the urban population and the reemployment of urban laid-off workers are critical to the further deepening of the economic reform. This is mainly because of two reasons.

First, most urban households live on jobs, while most rural households live on land. Employment in state-owned enterprises (SOEs) has been not only the basic source of urban household income, but also a key channel to receive most social services provided to urban residents.¹ Unemployment is a much more apparent and devastating problem for urban than for rural households. Limited employment supporting services, together with the absence of social institutions to deliver basic social services such as unemployment benefits, pension, and health care outside the state sector, have forced the government to restrict the SOEs from laying off surplus workers. The development of an efficient urban labor market is crucial for the government to extend the economic reform to the SOEs while maintaining social stability in this transition from a planned economy to an open market economy.

Second, since China started its rural economic reform in 1978, more and more labor has been released from land and become “floating population” in the cities, looking for jobs mainly in the private sector, as most jobs in the state sector require urban residency permits. The development of an efficient urban job market to facilitate the settlement of this floating population will not only release the burden to the redeployment of surplus urban labor and support the continuation of SOE reform, but it will also allow the deepening of rural economic reform, which will lead to more rural to urban labor migration due to increased agriculture productivity. On the contrary, blocking this migration trend by tightening and strictly enforcing laws on urban residency permits will only let this river of migration overflow, increase social tension, and slow the speed of economic reform.

¹In most of the years since 1985, the SOEs have employed 70 to 75 percent of the urban employees, and provided wages account for over 60 percent of total urban household income.

Meanwhile, the development of an efficient urban labor market is confronting new opportunities and challenges from the increasing international competition following China's accession to the World Trade Organization (WTO). This increasing international competition has put more pressure on the already troublesome SOEs and has put more job positions in the SOEs in jeopardy. The SOE reform becomes inevitable to reduce the social service burdens (including employment targets) imposed on the SOEs and enable them to compete on an equal footing with foreign firms. Creating an efficient labor market to accelerate the redeployment of redundant urban and rural labor is therefore essential to facilitate China's transition to a more open economy without triggering an unbearable unemployment problem. This is especially important for China, the world's most populous country. China's stability and growth are also globally beneficial.

The current job placement system in China's state sector, to a large extent, still allocates workers administratively to available positions without allowing much information exchange between employers and employees. Such redeployment of surplus labor is neither effective nor efficient and often results in mismatch of skills. In 1999, more than 11.2 million job vacancies were registered, but less than 9 million job seekers successfully found a job (*China Labor Statistical Yearbook*, 2000, 91-92). The reemployment rate of laid-off workers from the SOEs was only 4.3 percent in the first quarter of 2002 (First Quarterly Report 2002, Ministry of Labor and Social Security). Improving information dissemination of job openings is a key to develop an efficient urban labor market. Better job opening information dissemination will facilitate the labor redeployment by matching workers to their potential employers and providing enterprises with more discretion in redeploying surplus labor.

A very interesting development in China's labor market has been the rising of the non-state sector, which employed over 17 percent of China's total labor force in 2000. This sector includes wholly foreign-owned or joint-owned or share-holding enterprises. A driving force of the growth of the non-state sector is the huge influxes of foreign direct investment (FDI). Since 1993, China has become the second largest FDI recipient country after the United States. The foreign firms in China, together with the domestic firms in the non-state sector, have opened many job search channels in the urban sector, including private employment agencies, newspaper advertisements, job fairs, and Internet job boards. These channels have enabled effective information exchange between job seekers and potential employers, offered more job

opportunities to qualified workers, increased productivity, and led to faster wage increase in the non-state sector, especially in foreign firms either wholly foreign-owned or joint ventures.

Given the uneven development of job opening information dissemination between the state sector and the non-state sector, a mixed scenario of labor migration is likely to unfold as more foreign firms enter the Chinese economy. A predictable positive outcome is that more job information dissemination in the non-state sector provides more employment opportunities for the surplus labor released from the state sector and agriculture. However, more job information dissemination outside the state sector also facilitates foreign firms to recruit (or compete) high-caliber workers from the SOEs. This can hinder the productivity in the state sector, increase the number of non-profitable SOEs, and make SOE reform more difficult.

This paper will identify barriers to job opening information dissemination in China's state sector and evaluate the potential impact of market-driven job opening information dissemination on the redeployment of China's urban and rural surplus labor, who become urban job seekers. The paper will demonstrate that enhanced information exchange in job openings will increase productivity and wage as the quality of job match improves. The paper will also provide policy insights in improving job information flow and deepening the SOE reform.

The rest of the paper is organized as follows. Section 2 reviews the development of China's labor market and the related literature. Section 3 uses the asset-value approach in Davidson and Matusz (2000a and 2000b) and Shapiro and Stiglitz (1984) to develop a job search model with two partially integrated markets: one for the state sector and one for the non-state sector. The equilibrium in this segmented job market is derived in Appendix A to model labor migration and productivity differences between these two sectors. Section 4 uses the theoretical framework and available data to examine the impact of enhanced job opening information dissemination on productivity and SOE reform. Section 5 discusses policy implications and identifies areas for future research.

2 BACKGROUND

2.1 CHINA'S EMERGING LABOR MARKET

China's current employment system is inherited heavily from that of a traditional planned economy, in which unemployment was seldom an apparent problem. The command-and-control

system aimed at allocating every household in the rural area a piece of land to work on and everyone in the urban labor force a job with a given wage through a central placement system monitored by the government. The government also monitored closely internal promotions and external job transfers. Migration between rural and urban sectors was very restrictive as a result of the Household registration (*Hu Kou*) system. The SOEs had an advantage to choose employees from the job candidates first. Job seekers entering the labor force had few legitimate ways, except via connection and corruption, to approach potential employers. The jobs of formal employees in the state sector were extremely secured and were called “iron rice bowls” (*Tie Fan Wan*).

This command-and-control system endured a great challenge from the rapid population growth at an annual rate exceeding 2 percent for over two decades from 1949 to 1974 (*Population Census of China*). As the average annual growth rate of new capital investment was 9.8 percent over a much smaller base from 1953 to 1978 (*China Statistical Yearbook*, p.38), low productivity due to decreasing returns forced the Chinese government to adopt the one-child policy in 1979 right after the launch of economic reform in late 1978. This birth control temporally alleviated the potential problem of disguised unemployment. The command-and-control system targeted at allocating everyone in the urban labor force a job remained in effect until the early to mid-1990s.

As the government found it increasingly difficult to place new job candidates, increasing numbers of young people were classified as “waiting to be employed” (*Dai Ye*) during the mid-1980s to early 1990s. From the late 1990s, all job candidates are encouraged to look for jobs by themselves. Anyone who enters the labor force and fails to find a job is now classified as unemployed. A job in the state sector remained very secure up until 1994. Since then, the SOEs can lay off workers purely on economic grounds and to claim bankruptcy if the government declines to bail them out. To help the unemployed workers, the Labor Department and other organizations first set up reemployment service centers also in 1994.² By 1998, the first year of the SOE reform, the State Council required that all SOEs with laid-off workers should create a reemployment service center.

²The unemployment rate in most of the years from 1981 to 1993 was below 2.5 percent, and over 80 percent of unemployed were youth who were waiting to be assigned a job. This percentage of youth unemployment dropped significantly to just over 60 percent in 1994 (*China Statistical Yearbook 1995*, p.106).

Reemployment service centers create a new category in China's labor force: laid-off workers from the SOEs who are not classified as unemployed. These laid-off workers receive from the centers a monthly income and social benefits (ranging from medical insurance to subsidized housing, but varying among centers). An additional function of reemployment service centers is to provide skill-training workshops to laid-off employees. Their monthly income is less than the wage received previously but more than the unemployment benefit to which the individual would be entitled. Individuals in the reemployment service centers receive retraining and have a priority to be hired into a new or restructured SOE. They can stay in the center for up to three years and are eligible for unemployment benefits for up to two additional years after that. At the end of 2000, about 6.1 million workers were in the various reemployment service centers. About doubled the number of workers who received unemployment insurance benefits elsewhere that year.

Besides reducing productivity and creating disguised unemployment, there is another pitfall of the command-and-control system. Most SOEs have covered all medical expenses, housing and food subsidy, and social security of their employees. Some firms even have had their own day care centers, kindergartens, and pre-schools offering high quality education service at heavily subsidized rates. The state sector was all the three: a firm, an insurance company, and a social welfare agency. The SOEs still employed over 70 percent of total long-term employees and almost 60 percent of household income was wage income from the SOEs in 1999 (*China Labor Statistical Yearbook*, 1999, p.78). Given this dominant role played by the SOEs, a limited number of agencies have been providing these services both as a result of government restrictions and lack of general demand and funding.

Before the economic reform, urban workers were unable to buy any insurance on their own, including medical and unemployment insurance. Thus, most of the fringe benefits offered by the SOEs were available only for employees in the state sector. Also, most of these benefits were distributed among workers according to their seniority, regardless of their effort to acquire experience on the job. In a sense, the gap between wage and marginal productivity was a premium paid to receive a uniform welfare package designed for all employees with the same number of years in service.

Now, more than three years into the SOE reform, private insurance companies and separate government agencies that provide social safety nets—including unemployment benefits,

medical insurance, social security, housing and food subsidy—to the poor and needy, not to employees as a bonus or substitute for wage, are emerging but still premature. There have been many complaints of obtaining reimbursements from private insurance companies. Due to these disadvantages in acquiring human, physical, and financial capital, many collective owned domestic enterprises in the non-state sector had “backward” technology.³ As a result of all these factors, jobs in the non-state sector were mainly in the collective enterprises and were considered as second-class jobs until the late 1990s.

This paper identifies the important impact of increasing private job opening information dissemination due to the huge FDI influxes on the potential employees’ perception and awareness of job opportunities outside the state sector, in both foreign and domestic firms. Since the two biggest advantages of jobs in the state sector were security and fringe benefits, the information dissemination of job openings in the non-state sector first plays a very important role in increasing the chance of reemployment once unemployed and thereby reducing the insecurity of jobs in the non-state sector. Second, as the percentage of employees in the non-state sector increases, more people purchase health and unemployment insurance out of their own pocket. This surge in demand is contributing significantly to the emergence of a mature private insurance market and government welfare agencies separated from the SOEs.

This “privatization” of the labor market is indeed the vision of the Chinese government. By 1999, the percentage of private career service centers increased to about 11 percent, while that of those run by the Labor Department fell to 72 percent (*China Labor Statistical Yearbook*, 2000, p.90). The State Council decided that newly laid-off workers should no longer enter the reemployment service centers after the end of 2000. In principle, the reemployment service centers will cease to function at the end of 2003. In the future, laid-off workers will go directly to the regular employment service agencies and the unemployment insurance program. The reemployment service centers will disappear, having accomplished their historic role in facilitating the transition of the welfare system from dependency toward self-sufficiency as the United States Family Support Act of 1988 studied in Bane and Ellwood (1994).

³The central and local government used to allocate raw materials, capital, and loans to all firms, as a private financial sector did not exist until very recently. SOEs received most of their funds and some machinery and raw materials at discounted prices. Even now, non-state-owned enterprises still have less access to loans because a majority of financial institutions are still owned by the government or operated by government-appointed officials.

2.2 RELATED LITERATURE

Many studies have analyzed job market segmentation but have not focused on the effect of job opening information dissemination on job matching, labor migration, and hence competition between the state sector and the non-state sector in the labor market. A few exceptions are Gordon and Li (1991 and 1999), the Labor Market Information System Project conducted between the English-speaking Caribbean and Surinam, and the Strengthening Labor Market Information Project conducted in Egypt. Both the latter two are part of the Bureau of International Labor Affairs Technical Cooperation Program.

On the other hand, there is a growing body of literature about the labor market in the transition economies and developing countries facing increasing international competition. Wu (2001a and 2001b) demonstrates that the rapid growth of multinational firms in China has a significant impact on the labor market, especially on the relative wage of skilled versus unskilled labor. Qian, Roland, and Xu (1998) draw attention to a new channel of job search in China's state sector through the municipal governments, which have received the delegated responsibilities from the state government to coordinate the laid-off and reemployment of SOE workers since 1997. The United Nations Development Program (UNDP) (1997 and 1999) collects studies on China's human development during China's transition toward a market economy and makes policy recommendations in promoting human development for the new millennium. Other works on China's SOE reform and its impact on China's labor market are Bolton (1995); Che and Qian (1998a and 1998b); Groves, et al. (1994 and 1995); Jin and Qian (1998); Lau, Qian, and Roland (2000); Li (1997); Masking, Qian, and Xu (2000); McMillan, Whalley, and Zhu (1989); and Weitzman and Xu (1993).

A parallel study on the labor market in transitional economies in Central and Eastern Europe includes Aghion and Blanchard (1994 and 1998); Basu, Estrin, and Svejnar (1994); Blanchard (1997); Blanchard, et al. (1991); Blanchard and Kermer (1997); Commander and Coricelli (1995); Munich, Svejnar, and Terrell (1998); Rodrik (1995); Roland (2000); and Roland and Sekkat (forthcoming). Qian and Xu (1993) and Qian, Roland, and Xu (1999) compare China's economic reform with the reforms in Eastern Europe.

3 THEORETICAL MODEL

According to the current and past labor market situation in China described in the previous section, a job search model is developed in this section to analyze the impact of job opening information dissemination on the compensation scheme (wage and fringe benefits) offered in the state sector and the market equilibrium wage in the non-state sector. The paper will then examine the pattern of labor migration between the state sector and the non-state sector due to their different compensation schemes as job market information flow increases.

To allow for productivity and non-productivity differences among workers, the following analysis considers an economy with a continuum of workers of different ages (a) and levels of skills or ability (b). a reflects a worker's non-productive idiosyncrasy such as "pure" seniority regardless of the level of experience accumulated on the job, while b reflects a worker's ability as a result of education, health, job training/experience, and any other factors that directly or indirectly affect productivity.⁴ For simplicity, both a and b are assumed to be distributed uniformly over the interval $[0,1]$, and the two distributions are independent of each other.

Suppose that a worker's marginal product equals be , i.e., each worker with ability b and effort e produces one unit of the final product. Normalize the price of the good to one. Hence, b measures a worker's productivity at a given effort level. Each worker's utility per period is assumed to be $U(m) + f - V(e)$, where m is monetary income and f are fringe benefits. In the state sector,

$$m_s = \alpha be, \quad f_s = aB, \quad (1)$$

where $\alpha \in [0,1]$ is the percentage return to productivity and B is the additional fringe benefits that a worker receives as her seniority on the job advances one more year. Hereafter, a "younger" worker refers to one who qualifies for fewer fringe benefits due to any non-productive idiosyncrasy. Both α and B are determined in the next section by the elected or assigned government officials in the state sector, who represent the collective interest of all employed workers in the state sector as modeled in most recent studies on unions and SOEs.

⁴In reality, age is related to experience and hence to productivity. Here, a only represents one's number of years in service, and one's experience is captured in b for better illustration of the fact that most fringe benefits are distributed purely according to one's seniority regardless of one's effort in making any progress or obtaining any experience on the job. As a result, we will avoid using pure age data in interpreting the empirical findings.

This setup is similar to that in Gordon and Li (1999) except that f increases with seniority as shown in Lau, Qian, and Roland (2000) and contributes directly to utility while m is converted to utility through U .⁵ The latter is because most fringe benefits modeled in this paper, such as housing, medical care, and recreational facilities, are non-monetary in-kind transfers. For any given $m = f$, $U(m) \geq f$, because f provides specific goods or services that increase a worker's utility but are not convertible to other goods or services as money could. Also, $U(\cdot)$ is assumed to be strictly concave and $V(\cdot)$ strictly convex with $U(0) = V(0) = 0$.

Suppose the cost of providing fringe benefits in a competitive market is also one, the same as the price of the final good. In such a case, firms in the non-state sector will allocate all money to wage payments and spend nothing to provide fringe benefits because, though the benefits may cost the same, the money received as wages provides more flexibility and hence higher utility to workers. Thus, in the competitive non-state sector,

$$m_n = be, \quad f_n = 0 \quad (2)$$

Clearly, the trade-off between a state-sector job and a non-state-sector job is that workers in the state sector receive a wage lower than their marginal productivity in exchange for positive fringe benefits.⁶

Government officials in the state sector have an incentive to provide in-kind fringe benefits because of the monetary and/or non-monetary subsidies that bring their cost (β) of providing f below the market cost, i.e., $0 < \beta < 1$. The officials choose α and B to maximize the aggregate expected lifetime utility of all workers (currently employed in the SOEs) subject to the budget constraint,

$$\iint_A (\alpha be^* + \beta aB) dadb = \iint_A be^* dadb, \quad (3)$$

where A is the set of all workers in the state sector and e^* is each worker's optimal choice of effort level to maximize her own discounted expected lifetime utility as derived later in this

⁵Other major deviations from Gordon and Li (1999) are that workers here can become unemployed and reemployed after job search and that they discount their future wage and benefits. Also, since this paper does not consider the impact of tax revenue on income redistribution, the following analysis separates the government's budget in subsidizing the SOEs from its other objectives. Thus, tax revenue does not enter directly into budget constraint (3), but may affect wage in the state sector through an exogenous change in the cost of government-subsidized provision of fringe benefits (β).

⁶ B can be interpreted as the extra fringe benefits offered in the state sector compared to the non-state sector if firms in the non-state sector also offer positive fringe benefits.

section. Clearly, $\alpha < 1$ if $B > 0$ and $\alpha = 1$ if $B = 0$ for given effort input. Given the different compensation schemes, a worker at a given age and ability will choose different effort levels, $e_s(a, b)$ if employed in the state sector and $e_n(a, b)$ if employed in the non-state sector.

The following analysis adopts the approach in Davidson and Matusz (2000a and 2000b) and Shapiro and Stiglitz (1984) to model the hiring and firing as a Poisson process. It is assumed that the probability that a worker gets laid off each period is the same for all workers, p_s in the state sector and p_n in the non-state sector. $p_s \leq p_n$ as jobs in the state sector are in general more secure than those in the non-state sector.

For job seekers, the probability of being employed each period in the non-state sector is q . The current job placement system in China's state sector, to a large extent, still administratively allocates workers to available positions that are limited due to the high percentage of redundant labor in the state sector. Also, there are many legal barriers for people outside the state sector to get a job inside the state sector, especially for those from the rural sector. However, these restrictions do not apply to the non-state sector. Hence, it is assumed that the probability of finding a job in the state sector via job search is zero. For people entering the labor force, they are either assigned a job in the state sector or become job seekers in the non-state sector.

q is the main indicator for information dissemination of job openings in the non-state sector, as more information flow increases q . On the other hand, more job information exchange between firms in the state sector increases a worker's chance of being reemployed in the state sector. This is reflected by a lower p_s , as discussed in Section 2.1, most laid-off workers from the SOEs are not classified as unemployed during their job search for another job in the state sector. Once they enter the unemployment pool, their chance of being reemployed in the state sector is the same as the others in the unemployment pool.

We now derive a worker's expected lifetime utility, V_i^E for one who is currently employed in sector i and V_i^S for one who is laid off from sector i and is searching for a job, $i = s$ for the state sector and $i = n$ for the non-state sector. Workers who become unemployed

from the state sector receive a sustainable wage (\underline{w}) while those from the non-state sector receive nothing when they remain unemployed.⁷

Following the derivation in Shapiro and Stiglitz (1984), Appendix A shows that, given each worker's choice of effort, $e_s^*(b, \alpha)$ implicitly determined in (A-9) and $e_n^*(b)$ in (A-10), and the minimum age \underline{a} given by (A-13) for each group of workers with ability b who stay in the state sector, the government officials in the SOEs choose α and B to maximize the aggregate utility of all employed workers in the state sector,

$$\frac{1}{p_s + r} \int_0^1 \left[(1 - q\underline{a}(b))(U(\alpha b e_s^*) - V(e_s^*) + p_s V_s^S) + B \left(\frac{1 - q\underline{a}(b)}{p_s + r} + \frac{1 - q\underline{a}(b)^2}{2} \right) \right] db, \quad (4)$$

where V_s^S is given by Equation (A-5) with $e_n = e_n^*(b)$ and does not depend on age and the compensation scheme in the state sector. The budget constraint (3) becomes

$$\int_0^1 \left[\alpha b e_s^*(b, \alpha)(1 - q\underline{a}(b)) + \frac{\beta B}{2}(1 - q\underline{a}(b)^2) \right] db = \int_0^1 (1 - q\underline{a}(b)) b e_s^*(b, \alpha) db. \quad (5)$$

4 EMPIRICAL ANALYSIS

4.1 DATA DESCRIPTION

Data on FDI, welfare expenditure, wage, employment, placement rates, the number of job openings, job seekers, and replacement centers are compiled from the following sources:

- § *China Foreign Economic Statistical Yearbook*, 2000
- § *China Human Development Report: Human Development & Poverty Alleviation*, 1997
- § *China Human Development Report: Transition and the State*, 1999
- § *China Labor Statistical Yearbook*, 1990–2000
- § *China Statistical Abstract*, 2000–2001
- § *China Statistical Yearbook*, 1994–2000
- § *Ministry of Labor and Social Security: First Quarterly Report*, 2002

⁷As with fringe benefits, \underline{w} can be interpreted as the extra unemployment benefits offered in the state sector than in the non-state sector if some firms in the non-state sector also offer unemployment benefits.

§ *Population Census of China, 1990, 2000*

§ *World Investment Report 1999: Foreign Direct Investment and the Challenge of Development.*

4.2 HYPOTHESIS

This section will first provide a diagrammatic illustration of solution (A-15) derived in Appendix A from choosing α to maximize (4) subject to budget constraint (5). Since better job opening information dissemination is reflected by a higher q if in the non-state sector and a lower p_s if in the state sector, this section will analyze how changes in q and p_s would affect the curves in the diagram and form hypotheses of the impact of job opening information dissemination on the compensation schemes and productivities in both sectors as well as labor migration between sectors.

Figure 1 shows a worker's trade-off between reward to productivity α on the x-axis and fringe benefit B on the y-axis for each worker with a given age and ability, derived from the expected lifetime utility function (A-7) in Appendix A. The worker's indifference curve is convex, as its slope is $dB/d\alpha = -be_s^*U'(\alpha be_s^*)/(a+1/(p_s+r))$, which is assumed to be flatter as α increases. For a worker with a lower a or a higher b , the indifference curve becomes steeper, as shown in the expression of $dB/d\alpha$. The optimal choice of α^* and B^* is where the indifference curve for an "average" worker in the state sector given by (4) is tangent to the budget constraint (5), which is assumed to be concave (linear if α has no effect on \underline{a} and e_s^*).⁸

⁸Here, more restrictions are put on the functional forms of U and V to ensure that the indifference curve and the budget constraint have the properties to yield a stable interior equilibrium. These additional assumptions are supported by the empirical findings later in the paper.

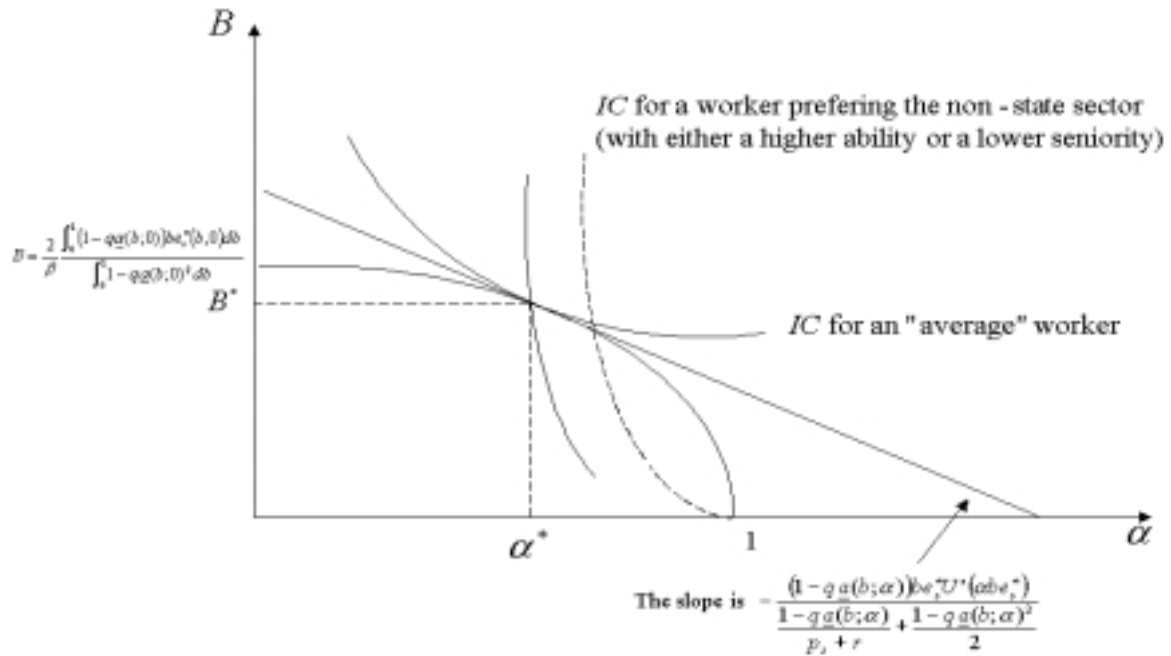


FIGURE 1. EQUILIBRIUM COMPENSATION SCHEME IN THE STATE SECTOR

Given their steeper indifference curves, workers with higher ability receive a higher utility in the non-state sector, where they receive a full payment of their marginal product. This is shown by the dotted IC curve representing a payoff be in the non-state sector, which yields a higher utility level than the parallel solid IC curve representing an alternative payoff $\alpha^*be + aB^*$ in the state sector. Moreover, Appendix A shows that these workers in the non-state sector also spend more effort than workers employed in the state sector. Thus, hypothesis H1 holds if the assumptions on the shapes of the indifference curves and budget constraint are valid.

- H1** Workers in the non-state sector, on average, are more productive than those in the state sector, due to higher education or better health or other factors related to higher productivity. As a result, the average wage in the non-state sector is higher than that in the state sector.

We now examine the impact of better job opening information dissemination, i.e., an increase in q if in the non-state sector or a fall in p_s if in the state sector. A fall in p_s (the probability of being laid-off in the state sector) has an opposite effect as a rise in q (the probability of getting a job in the non-state sector). A rise in q or p_s increases a worker's incentive to migrate to the non-state sector and also her likelihood of success if q rises. As more productive workers leave the state sector, the indifference curve for an average worker becomes flatter.⁹ As shown in Figure 2, this increases the reward to seniority B^* and hence the proportional payment to fringe benefits and reduces the percentage return to productivity in the state sector α^* . This reduces each worker's effort input and productivity, which in turn, further reduces the total budget on wage payments and fringe benefits in the state sector.

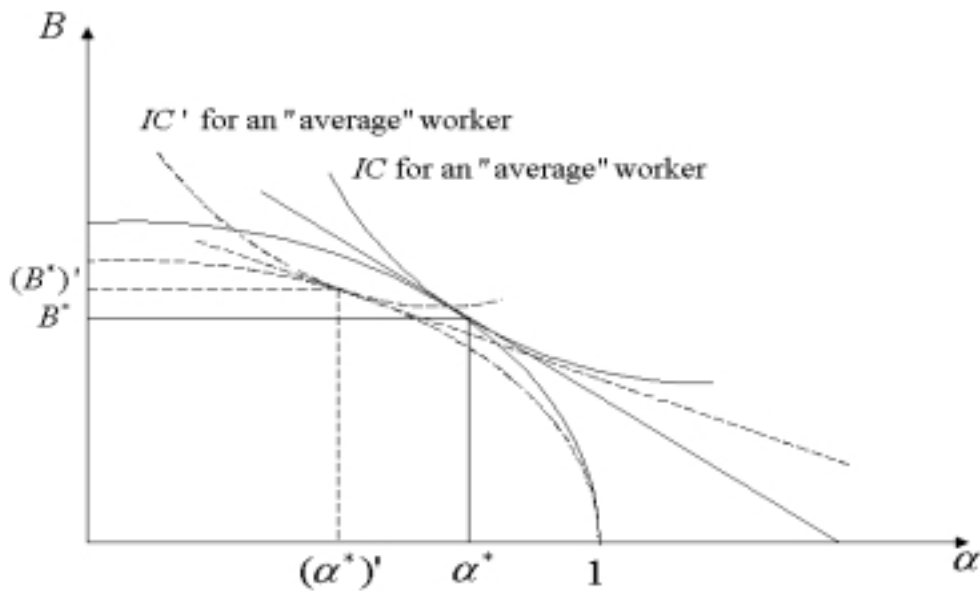


FIGURE 2. IMPACT OF JOB OPENING INFORMATION DISSEMINATION IN THE NON-STATE SECTOR ON THE COMPENSATION SCHEME IN THE STATE SECTOR

⁹This is because the sign of the derivative of the inverse of the slope of IC for an average worker is the sign of $d\left(\frac{1-qa^2}{1-qa}\right)/dq$, which is $\underline{a}(1-\underline{a})+q(1-2\underline{a}+q\underline{a}^2)d\underline{a}/dq$ and is positive if $\underline{a} \leq 1/2$. At $\alpha = 0$, B also decreases as the sign of dB/dq is the same as $-\underline{a}(1-\underline{a})-q(1-2\underline{a})d\underline{a}/dq$, which is negative if $\underline{a} \leq 1/2$. Hence, $\underline{a} \leq 1/2$ is a sufficient but not necessary condition for a higher q to reduce the slope of an average worker's indifference curve and shift down the budget constraint. A change in p_s has a similar effect.

H2 As the information dissemination of job openings in the non-state sector improves while that in the state sector deteriorates or improves more slowly, the average ability/productivity of workers staying in the state sector either decreases or increases at a slower rate than that in the non-state sector. In the state sector, the reward to productivity drops, while seniority becomes more rewarding in receiving fringe benefits.

Finally, q may differ for workers of different age and ability. If workers with higher ability (productivity) are relatively in shortage and hence have a better chance to find a job in the non-state sector, as shown in Gordon and Li (1999), then this would intensify the above trend. Thus, more job opening information dissemination in the non-state sector increases job opportunities but also helps firms in the non-state sector to compete with the SOEs for more productive workers and has partly contributed to the recent profit losses in many SOEs.

H3 Since workers with higher education or in better health status are in shortage in the job market, it is even harder for firms in the state sector to keep these workers without increasing the relative reward to productivity in the compensation scheme, especially when confronting the competition from the huge influxes of foreign direct investment.

4.3 EMPIRICAL EVIDENCE

Before we discuss the impact of job opening information dissemination on labor migration between the state sector and the non-state sector, a natural question in mind is whether the non-state sector is large enough to have any impact on China's labor market. Following China's accession to the WTO, it becomes even more important to evaluate, within the non-state sector, the contribution of the growing category of other ownership enterprises including both domestic and foreign-owned or share holding corporations. This category increased from employing only 0.36 percent of long-term employees in 1985 to 17.18 percent of total employees at the end of 2000 (calculated from Table 1). In 1978, over 72 percent of newly employed persons in urban areas were in the SOEs, and this rate fell to below 32 percent in 1997 (*China Statistical Year book 1998*, p.156).

TABLE 1. NUMBER OF LONG-TERM EMPLOYEES BY OWNERSHIP
(1,000 persons, end of the year)

Year	Total	State Sector*		Non-State Sector			
		Number	Annual Rate of Growth (%)	Collective		Other Ownership**	
				Number	Annual Rate of Growth (%)	Number	Annual Rate of Growth (%)
1985	123,580	89,900	4.09	33,240	3.36	440	18.92
1986	128,090	93,330	3.82	34,210	2.92	550	25.00
1987	132,140	96,540	3.44	34,880	1.96	720	30.91
1988	136,080	99,830	3.41	35,270	1.12	970	34.72
1989	137,420	101,090	1.26	35,020	-0.71	1,320	36.08
1990	140,590	103,460	2.34	35,490	1.34	1,640	24.24
1991	145,080	106,640	3.07	36,280	2.23	2,160	31.71
1992	147,920	108,890	2.11	36,210	-0.19	2,820	30.56
1993	148,490	109,200	0.28	33,930	-6.30	5,360	90.07
1994	148,490	108,900	-0.27	32,110	-5.36	7,470	39.37
1995	149,080	109,550	0.60	30,760	-4.20	8,770	17.40
1996	148,450	109,490	-0.05	29,540	-3.97	9,417	7.38
1997	146,680	107,660	-1.67	28,170	-4.64	10,855	15.28
1998	123,370	88,090	-18.18	19,000	-32.55	16,276	49.94
1999	117,734	83,361	-5.37	16,519	-13.06	17,854	9.69
2000	112,590	78,780	-5.50	14,470	-12.40	19,345	8.35

*From 1998, the numbers include only on-post and staff workers, but no laid-off workers.

**Including all enterprises of domestic funded, cooperative units, joint-owned units, collective joint-owned units, limited liability corporations, state-funded corporations, and share holding corporations Ltd., but excluding private enterprises and township and village enterprises. This classification applies to all tables in the paper.

Sources: *China Labor Statistical Yearbook*, 2000; *China Statistical Abstract*, 2000 and 2001.

Table 1 reveals two significant turning points.¹⁰ One was in 1993 when China first became the second largest FDI recipient country after the United States (United Nations Conference on Trade and Development (UNCTAD), 1999). The annual growth rate of employees in the state sector fell significantly from above 2 percent until 1992 to 0.28 percent in 1993, while the annual employment growth rate in the other ownership enterprises jumped to 90.07 percent in 1993. By 1994, the composition of long-term employees in the other ownership enterprises first exceeded 5 percent of the total. This coincides with the FDI growth that more than doubled from 1992 to 1993 while the total value of foreign capital used also doubled in that

¹⁰The classifications in this table and the rest in the paper are based on types of ownership regardless of geographical location. Firms in the specific economic zones are also classified into these three categories: state owned, collective owned, and other ownership enterprises. Private and town and village enterprises are excluded, as job openings play a very limited role in these enterprises whose employees are mainly friends and relatives in a close neighborhood.

period, as shown in Table 2. The dollar value of FDI inflow reached its historic high in 1998, only a year after the East Asian financial crisis.

TABLE 2. VALUE OF FOREIGN CAPITAL USED (US\$ 1 MILLION)

Year	Total		Foreign Direct Investment		Foreign Loans	Other Foreign Investment
	Value	Annual Rate of Growth (%)	Value	Annual Rate of Growth (%)		
1979-99	459,564		305,922		137,339	16,303
1979-82	12,457		1,166		10,690	601
1983	1,981		636		1,065	280
1984	2,705	36.55	1,258	97.80	1,286	161
1985	4,647	71.79	1,661	32.03	2,688	298
1986	7,258	56.19	1,874	12.82	5,014	370
1987	8,452	16.45	2,314	23.48	5,805	333
1988	10,226	20.99	3,194	38.03	6,487	545
1989	10,059	-1.63	3,392	6.20	6,286	381
1990	10,289	2.29	3,487	2.80	6,534	268
1991	11,554	12.29	4,366	25.21	6,888	300
1992	19,202	66.19	11,007	152.11	7,911	284
1993	38,960	102.90	27,515	149.98	11,189	256
1994	43,213	10.92	33,767	22.72	9,267	179
1995	48,133	11.39	37,521	11.12	10,327	285
1996	54,804	13.86	41,725	11.20	12,669	410
1997	64,408	17.52	45,257	8.46	12,021	7,130
1998	58,557	-9.08	45,463	0.46	11,000	2,094
1999	52,659	-10.07	40,319	-11.31	10,212	2,128
2000	59,356	12.72	40,715	0.98	10,000	8,641

Sources: *China Foreign Economic Statistical Yearbook*, 2000; *China Statistical Abstract*, 2001.

The second turning point was in 1998 when the SOE reform was launched. Employment in the state sector fell dramatically and continued to fall into year 2000, which clearly indicated the disguised unemployment problem resulting from the command-and-control system. On the other hand, the employment in the other ownership enterprises grew almost 50 percent in that year and showed a clear sign of expansion in spite of the obvious contraction in the state sector.

The collective owned enterprises in the non-state sector were squeezed by the other ownership enterprises as well as the state sector. Their number of employees kept falling through out the 1990s. By 1999, the total number of employees in the other ownership enterprises surpassed that of collective owned enterprises by over 1 million employees, although the latter was almost 76 times higher than the former back in 1985. One explanation is the many

inherited disadvantages of the collective owned enterprises under the command-and-control system ever since 1949, as discussed in Section 2.1.

These findings have confirmed that it is important to analyze the labor migration between the state sector and the non-state sector, especially between the SOEs and the other ownership enterprises, in studying the impact of job opening information dissemination on China's urban labor market.

We now examine whether hypothesis H1 holds so that the major assumptions in the theoretical model would hold, and the model would provide good explanation and prediction of the real world phenomena. First, the average wage of permanent staff and workers in the state sector was higher than the national average and that in the collective owned enterprises, but it was lower than that in the other ownership enterprises in all years since 1984, as shown in Table 3. This average wage gap between the state sector and the other ownership enterprises reached its highest peak in 1993 when FDI more than doubled, and then dropped almost by a half from 1997 to 1998 when the SOE reform started. By 2001, this gap further dropped to only 8.61 percent above the wage paid in the state sector. This was after the deepening of enterprise wage reform, which allowed over 100 million enterprises in 88 cities to negotiate wages with employees in that year (First Quarterly Report 2002, Ministry of Labor and Social Security).

TABLE 3. AVERAGE WAGE OF STAFF AND WORKERS BY OWNERSHIP (YUAN)

Year	National Average	State Sector		Non-State Sector			
		Wage**	Percentage of National (%)	Collective		Other Ownership*	
				Wage	Percentage of State (%)	Wage	Percentage of State (%)
1984	974	1,034	6.16	811	78.43	1,048	101.35
1985	1,148	1,213	5.66	967	79.72	1,436	118.38
1986	1,329	1,414	6.40	1,092	77.23	1,629	115.21
1987	1,459	1,546	5.96	1,207	78.07	1,879	121.54
1988	1,747	1,853	6.07	1,426	76.96	2,382	128.55
1989	1,935	2,055	6.20	1,557	75.77	2,707	131.73
1990	2,140	2,284	6.73	1,681	73.60	2,987	130.78
1991	2,340	2,477	5.85	1,866	75.33	3,468	140.01
1992	2,711	2,878	6.16	2,109	73.28	3,966	137.80
1993	3,371	3,532	4.78	2,592	73.39	4,966	140.60
1994	4,538	4,797	5.71	3,245	67.65	6,303	131.39
1995	5,500	5,625	2.27	3,931	69.88	7,463	132.68
1996	6,210	6,280	1.13	4,302	68.50	8,261	131.54
1997	6,470	6,747	4.28	4,512	66.87	8,789	130.27
1998	7,479	7,668	2.53	5,331	69.52	8,972	117.01
1999	8,346	8,543	2.36	5,774	67.59	9,829	115.05
2000	9,371	9,552	1.93	6,262	65.56	10,984	114.99
2001	10,870	11,178	2.83	6,867	61.43	12,140	108.61

*The average is higher for foreign funded enterprises and those funded by entrepreneurs from Hong Kong, Macao, and Taiwan than the other enterprises in this category.

**From 1998, the wages in the state sector are the average wage of the on-post staff and workers only.

Sources: *China Statistical Yearbook*, 2001; *China Statistical Abstract*, 2001; First Quarterly Report 2002, Ministry of Labor and Social Security.

Second, Table 4 calculates per-capita industrial output value added as an estimate for productivity.¹¹ To be compatible with the nominal wage data in Table 3, the average productivities are in current prices and hence are higher than the real productivities calculated in Gordon and Li (1999) due to inflation for most of the years in their data set from 1985 to 1994. Also, Table 4 concentrates on the productivity comparison between the state sector and other ownership enterprises and ignores the collective owned enterprises, as both Table 1 and Table 3

¹¹Longitude productivity data by ownership from 1985 to 2000 are unavailable even if we only focus on industry productivity. Industry, including mining and quarrying, manufacturing, electricity, gas and water production and supply, attracts a majority share of total FDI, which was over 60 percent in 1998 (Wu, 2001b). The productivity estimates in this paper are biased upward for all sectors because the calculation is based on the number of long-term employees at the end of each year. However, only the magnitude of the productivity gap between the state sector and the non-state sector will change if we include the contract staff and workers at the end of the year.

show that other ownership enterprises rather than collective owned enterprises are the main competitor of the state sector in China's labor market.

TABLE 4. PER-CAPITA INDUSTRIAL OUTPUT VALUE ADDED BY OWNERSHIP
(total value in billion yuan, number of employees in 1,000 persons,
and average value added in yuan)

Year	State Sector*				Other Ownership				
	Total	Employee (end of yr.)	Average Value Added**		Total	Employee (end of yr.)	Average Value Added		
			Value	Annual Growth Rate (%)			Value	Annual Growth Rate (%)	Value in Excess of State
1985	630	38,150	5,617		12	368	8,295		2,678
1986	697	39,550	5,993	6.70	16	456	9,300	12.12	3,307
1987	825	40,860	6,865	14.55	28	583	12,434	33.70	5,569
1988	1,035	42,290	8,322	21.23	50	790	16,301	31.10	7,979
1989	1,234	42,730	9,821	18.01	76	1,100	17,926	9.97	8,105
1990	1,306	43,640	10,178	3.63	105	1,370	19,881	10.91	9,703
1991	1,496	44,720	11,370	11.71	160	1,820	22,857	14.97	11,487
1992	1,782	45,210	13,404	17.89	263	2,390	28,654	25.36	15,250
1993	2,273	44,980	17,178	28.15	535	4,356	31,945	11.48	14,767
1994	2,620	43,710	20,381	18.65	1,042	6,072	44,622	39.68	24,242
1995	3,122	43,970	24,141	18.45	1,523	7,102	55,760	24.96	31,619
1996	3,617	42,770	28,756	19.12	1,658	7,434	57,995	4.01	29,239
1997	3,597	40,400	30,270	5.27	2,098	8,473	64,385	11.02	34,115
1998	3,362	27,210	42,011	38.79	2,727	12,293	57,677	-10.42	15,666
1999	3,557	24,120	50,143	19.36	3,296	13,428	63,823	10.66	13,680
2000***	4,102	20,960	66,536	32.69	4,418	14,430	79,604	24.73	13,067

*Include all state-owned and state holding majority shares enterprises.

**Double counting does occur among different enterprises although there is no double counting in gross industrial output value within each enterprise. Thus, we use the value added rate in 2000 to calculate the per-capita (average) value added. This rate is 34 percent in the state sector and 26 percent in the other ownership enterprises.

***The 2000 data include only industries with sales revenue above 5 million yuan and hence may not be compatible with previous years' data.

Sources: *China Statistical Yearbook*, 2000 to 2001; *China Statistical Abstract*, 2000 to 2001; *China Labor Statistical Yearbook*, 2000.

The last column in Table 4 shows that productivity was higher in other ownership enterprises from 1985 to 2000. Together with Table 3, these empirical results support hypothesis H1 that workers in the non-state sector, on average, are more productive and earn a higher average wage than those in the state sector. Moreover, the last column of Table 5 shows that the percentage of engineers and technicians in the other ownership enterprises exceeded the national average and those of both the state and collective owned enterprises from 1994 to 1997, although

this percentage was the highest in the SOEs back in 1993. Also, each year's share of engineers/technicians out of the national total was the highest among the other ownership enterprises' national shares, while the percentage of other employees was the highest for the SOEs, and that of workers/apprentices was the highest for the collective owned enterprises. These evidences further support hypothesis H1 by indicating a higher percentage of skilled workers in the other ownership enterprises than in the SOEs.

Table 4 also shows that the increase of FDI inflow in the early 1990s initially coincided with a greater increase in productivity in the state sector from an annual productivity growth rate of 17.89 percent in 1992 to 28.15 percent in 1993. However, the annual growth rate of productivity in other ownership enterprises was much higher for two consecutive years from 1994 to 1995. On the contrary, the annual growth rate of productivity in the state sector fell to 5.27 percent, and the productivity gap increased to 34,115 yuan in 1997. This supports hypothesis H2 that productivity grows more slowly in the state sector than in the non-state sector. Together with Table 5, the data also support the argument in hypothesis H3 that the huge influxes of FDI did draw away more productive workers and hinder the productivity growth in the state sector.

During the first year of SOE reform in 1998, productivity increased by almost 39 percent in the state sector and decreased for the first time by 10.42 percent in the other ownership enterprises, as shown in Table 4. The productivity gap was more than halved from 1997 to 1998 and kept falling to just above 13,000 yuan in 2000. Although this close-up of the productivity gap stimulates the overall productivity growth in all enterprises, the growth rate in the state sector remained about 7 percent higher than that in the other ownership enterprises. This shows that the attempt to leave rooms for the SOEs to lay off workers and to release them from their social welfare obligations was very effective in increasing the productivity in the state sector, although this reform has created some social tension and even hostile demonstrations of laid-off workers against the government.

TABLE 5. NUMBER OF STAFF AND WORKERS IN INDUSTRY AND CONSTRUCTION ENTERPRISES BY OCCUPATION
(1,000 persons, end of year)

	Workers & Apprentices		Engineers & Technicians		Administrative Personnel		Others		Enterprise Total	Eng & Tech in Enterprise Total (%)
	Number	% of Nat'l Total (%)	Number	% of Nat'l Total (%)	Number	% of Nat'l Total (%)	Number	% of Nat'l Total (%)		
1997										
Nat'l Total	4,813.8	100.00	474.8	100.00	730.8	100.00	708.4	100.00	6,727.8	7.06
State Owned	2,931.8	60.90	313.5	66.03	477.6	65.35	499.8	70.55	4,222.7	7.42
Collective Owned	1,241.8	25.80	97.0	20.43	158.6	21.70	165.3	23.33	1,662.7	5.83
Other Ownership	640.0	13.30	64.3	13.54	94.5	12.93	43.3	6.11	842.1	7.64
1996										
Nat'l Total	5,100.6	100.00	480.9	100.00	772.3	100.00	590.9	100.00	6,944.7	6.92
State Owned	3,177.1	62.29	325.7	67.73	515.8	66.79	414.8	70.20	4,433.4	7.35
Collective Owned	1,358.5	26.63	99.1	20.61	173.6	22.48	144.4	24.44	1,775.6	5.58
Other Ownership	565.1	11.08	56.2	11.69	83.0	10.75	31.7	5.36	736.0	7.64
1995										
Nat'l Total	5,275.7	100.00	484.4	100.00	816.5	100.00	1,086.1	100.00	7,662.7	6.32
State Owned	3,295.3	62.46	328.7	67.86	541.1	66.27	837.1	77.07	5,002.2	6.57
Collective Owned	1,450.4	27.49	103.3	21.33	192.6	23.59	183.3	16.88	1,929.6	5.35
Other Ownership	530.1	10.05	52.5	10.84	82.8	10.14	65.9	6.07	731.3	7.18
1994										
Nat'l Total	5,384.7	100.00	456.7	100.00	781.1	100.00	1,029.4	100.00	7,651.9	5.97
State Owned	3,350.9	62.23	319.2	69.89	528.2	67.62	799.3	77.65	4,997.6	6.39
Collective Owned	1,570.0	29.16	95.8	20.98	188.5	24.13	176.2	17.12	2,030.5	4.72
Other Ownership	463.8	8.61	41.6	9.11	64.5	8.26	53.7	5.22	623.6	6.67
1993										
Nat'l Total	5,284.3	100.00	422.3	100.00	747.9	100.00	401.6	100.00	6,856.1	6.16
State Owned	3,319.0	62.81	300.9	71.25	509.5	68.12	291.6	72.61	4,421.0	6.81
Collective Owned	1,637.4	30.99	94.0	22.26	194.1	25.95	93.0	23.16	2,018.5	4.66
Other Ownership	328.0	6.21	27.5	6.51	44.2	5.91	17.0	4.23	416.7	6.60

Sources: *China Statistical Yearbook*, 1994 to 1998.

We now look at the data on career service centers (including the reemployment centers run by the SOEs) to analyze their impact on the change in employment, wage, and productivity discussed above. From Table 6, the number of career service centers was increasing from 1995 to 1998, which coincided with the state sector's decreasing employment share illustrated in Table 1, and the state sector's lower annual growth rate of wage shown in Table 3 and productivity shown in Table 4. Table 7 further demonstrates that, over the same period, the percentage of privately sponsored career service centers was increasing faster than that of enterprises, institutions, and other organizations, while the percentage of the centers run by the Labor Department was decreasing. The latter fell to below 70 percent, and the total number of career service centers also fell to 26,793 by 2001 (First Quarterly Report 2002, Ministry of Labor and Social Security). This indicates that q increases faster than the fall of p_s , and hence our empirical findings of the average wage as reward to productivity in the state sector falling further below that in the other ownership enterprises support hypothesis H2.

Since the State Council required in 1998 that all SOEs with laid-off workers should create reemployment service centers, the number of career service centers run by enterprises, institutions, and other organizations increased dramatically from 1998 to 1999, while those run by the Labor Department fell by even more. The total number of career service centers actually decreased by over 5,000 in 1999 and then fell again by over 1,000 in 2000. This coincided with the narrowing wage and productivity gap between the state sector and the other ownership enterprises after 1998, which is consistent with the prediction in hypothesis H2.

A surprising finding from Table 6 is that the job placement rate (the number of placed job-seekers over total registered job-seekers) and the recruitment rate (the number of placed job-seekers over the total registered job vacancies) have both been decreasing since 1995, although the job seekers to job vacancies rate has stayed around 1.3. In 2000, the placement rate was below 50 percent and the recruitment rate was below 65 percent. The reemployment rate of laid-off workers from the SOEs was also decreasing and fell to 4.3 percent in the first quarter of 2002 (First Quarterly Report 2002, Ministry of Labor and Social Security). These data reveal a poor match of job seekers and potential employers. One possible explanation is lack of job information dissemination and another is lack of skills of job seekers.

TABLE 6. OVERVIEW OF CAREER SERVICE CENTERS

Year	Number of Career Service Centers (end of year)	Total Registered Job Vacancies (this year)	Total Registered Job Seekers (this year)	Placed Job Seekers	Placement Rate (for Job seekers) (%)	Recruitment Rate (to Fill Vacancies) (%)	Job Seekers to Vacancies Rate
1995	29,930		15,971,200	12,586,100	78.80		
1996	31,322	9,261,000	11,782,000	8,902,000	75.56	96.12	1.27
1997	33,469	9,149,000	11,525,000	8,672,000	75.25	94.79	1.26
1998	35,449	9,342,000	11,843,000	7,988,000	67.45	85.51	1.27
1999	30,242	11,242,430	15,929,636	8,843,638	55.52	78.66	1.42
2000	29,024	15,094,189	19,916,690	9,752,428	48.97	64.61	1.32

Sources: *China Statistical Yearbook*, 1995 to 2001; *China Labor Statistical Yearbook*, 2000.

TABLE 7. NUMBER OF CAREER SERVICE CENTERS BY SPONSOR

Year	Total	Run by Other Organizations					
		Run by Labor Department		Enterprises, Institutions, Organizations, and Others		Private	
		Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
1995	29,930	24,713	82.57	2,901	9.69	2,316	7.74
1996	31,322	26,154	83.50	3,196	10.20	1,972	6.30
1997	33,469	27,592	82.44	3,388	10.12	2,489	7.44
1998	35,449	28,717	81.01	3,626	10.23	3,106	8.76
1999	30,242	21,685	71.70	5,282	17.47	3,275	10.83

Sources: *China Statistical Yearbook*, 1995 to 2000; *China Labor Statistical Yearbook*, 2000.

Finally, Table 8 shows that the average pension paid to retirees was higher in the SOEs than in the other ownership enterprises from 1982 to 1998 except in 1987, 1988, and 1993. The average pension in the SOEs exceeded that in the other ownership enterprises by 586 yuan in 1998, which was record high even a year after the launch of SOE reform. From Table 9, the SOEs accounted for 73.38 percent of total expenditure on employee welfare, of which 93.75 percent was spent by domestic enterprises. However, the average welfare expenditure per employee in foreign funded enterprises in Table 10 was higher than all the other enterprises in 1999. This was true for all categories of spending except medical care, which was the highest in the SOEs. Since the SOEs usually obtain more favorable treatments in providing social welfare due to government intervention, these numbers can underestimate the real welfare benefits from the SOEs. Nonetheless, the data confirm the assumption that there is a positive although decreasing gap in fringe benefits offered by the SOEs and the other ownership enterprises.

TABLE 8. NUMBER OF RETIREES AND ENTERPRISES' EXPENDITURE ON PENSIONS
(number of retirees at the end of the year in 1,000 persons, total pensions in 1 billion yuan, and average pensions in yuan)

Year	National			State-Owned Units			Urban Collective Owned Units			Other Ownership Units			Gap in Average (State over Others)
	No. of Retirees	Total Pensions Paid	Average Pension	No. of Retirees	Total Pensions Paid	Average Pension	No. of Retirees	Total Pensions Paid	Average Pension	No. of Retirees	Total Pensions Paid	Average Pension	
1982	11,130	7.31	657	8,650	6.21	718	2,480	1.10	444				
1983	12,920	8.73	676	10,150	7.40	729	2,770	1.33	480				
1984	14,780	10.61	718	10,620	8.46	797	4,120	2.12	515	40	0.03	750	47
1985	16,370	14.56	889	11,650	11.61	997	4,670	2.91	623	50	0.04	800	197
1986	18,050	17.22	954	13,030	14.06	1,079	4,960	3.10	625	60	0.06	1,000	79
1987	19,680	20.81	1,057	14,240	17.19	1,207	5,380	3.53	656	60	0.08	1,333	-126
1988	21,200	27.51	1,298	15,440	22.05	1,428	5,680	5.32	937	80	0.14	1,750	-322
1989	22,010	31.94	1,451	16,290	25.89	1,589	5,620	5.91	1,052	100	0.14	1,400	189
1990	23,010	39.62	1,722	17,240	31.97	1,854	5,660	7.47	1,320	110	0.18	1,636	218
1991	24,330	46.75	1,921	18,330	38.07	2,077	5,880	8.45	1,437	120	0.23	1,917	160
1992	25,980	57.85	2,227	19,720	47.43	2,405	6,090	10.08	1,655	170	0.34	2,000	405
1993	27,800	75.93	2,731	21,430	62.32	2,908	5,960	12.39	2,079	410	1.22	2,976	-68
1994	29,290	104.36	3,563	22,490	87.59	3,895	6,200	14.62	2,358	600	2.15	3,583	311
1995	30,941	130.56	4,220	24,014	109.31	4,552	6,206	18.24	2,939	721	3.01	4,175	377
1996	32,116	155.22	4,833	25,153	130.82	5,201	6,155	20.40	3,314	808	4.00	4,950	250
1997	33,507	179.08	5,345	26,374	151.76	5,754	6,217	22.52	3,622	916	4.80	5,240	514
1998	35,936	207.37	5,771	27,827	172.60	6,203	6,042	22.90	3,790	2,044	11.48	5,616	586

Source: *China Labor Statistical Yearbook*, 2000.

TABLE 9. ENTERPRISES' EXPENDITURES ON EMPLOYEE WELFARE IN 1999
(1,000 yuan)

	Aggregate		Subsidies for Public Welfare & Facilities	Medical Care	Expenses for Cultural Activities, Sports, and Propaganda	Others
	Value	Percent of Total (%)				
Total	69,538,061		17,133,684	32,267,275	5,990,565	14,146,537
Grouped by Administrative Relationship						
1. Under Central Government	21,465,846	30.87	4,881,145	10,246,065	1,777,591	4,561,045
2. Under Provincial Government	18,392,864	26.45	4,195,272	8,236,483	2,198,029	3,763,080
3. Under Prefectural Government	18,574,149	26.71	4,852,417	8,853,795	1,226,196	3,641,741
4. At and Below County Level	10,540,270	15.16	3,026,275	4,702,674	751,022	2,060,300
5. Others	564,931	0.81	178,576	228,259	37,726	120,371
Grouped by Registration Status						
1. Domestic Enterprises	65,189,080	93.75	15,681,626	30,812,228	4,483,865	13,211,361
(a) State-Owned Enterprises	51,030,347	73.38	11,997,739	24,662,896	4,084,460	10,285,252
(b) Collective-Owned Enterprises	6,534,441	9.40	1,679,085	3,022,757	575,967	1,256,631
(c) Other Enterprises	7,624,292	10.96	2,004,801	3,126,574	823,438	1,669,479
2. Hong Kong, Macao, and Taiwan— Chinese Funded Enterprises	1,938,555	2.79	645,085	718,046	206,192	369,232
3. Foreign Funded Enterprises	2,410,426	3.47	806,973	737,001	300,507	565,944

Source: *China Labor Statistical Yearbook*, 2000.

TABLE 10. ENTERPRISES' WELFARE EXPENDITURE PER EMPLOYEE IN 1999 (yuan)

	Total Number of Employees (1,000)	Aggregate	Subsidies for Public Welfare & Facilities	Medical Care	Expenses for Cultural Activities, Sports, and Propaganda	Others
Total	117,734	591	146	274	51	120
Domestic Enterprises						
1. State-Owned Enterprises	83,361	612	144	296	49	123
2. Collective-Owned Enterprises	16,519	396	102	183	35	76
3. Other Enterprises	11,995	636	167	261	69	139
Hong Kong, Macao, and Taiwan— Chinese Funded Enterprises						
	2,951	657	219	243	70	125
Foreign Funded Enterprises						
	2,908	829	278	253	103	195

Sources: *China Labor Statistical Yearbook*, 2000; *China Statistical Yearbook*, 2000.

5 CONCLUSIONS AND EXTENSIONS

5.1 POLICY IMPLICATIONS

This section will explore the policy implications of job opening information dissemination on the growth of the non-state sector and the reform of the state job placement system. The above analysis shows that the compensation scheme under the traditional command-and-control system favored less productive workers so that more job opening information dissemination in the non-state sector encouraged more higher caliber workers to reallocate to the other ownership enterprises. The government-administered job allocation procedure under the command-and-control system indeed has discredited and acted as a barrier to more information dissemination of job openings in the state sector. As a result, both the wage gap and the productivity gap between the non-state sector and the state sector had widened before SOE reform took place in 1998.

This relocation of skilled and experienced workers from the SOEs to the other ownership enterprises had a spiraling effect. As the average productivity (ability) of workers who stayed in the state sector decreased, government officials representing the collective interest of all existing state employees were pressured to set the compensation scheme in the state sector more favorable to rewarding pure seniority regardless of experience rather than productivity. This induced more workers with higher productivity (ability) to migrate to the non-state sector and further tilted the compensation scheme against rewarding productivity. As average productivity dropped and the demand for government subsidy increased, it became inevitable that more SOEs went into deficit or at the brink of financial crisis, given the government's limited resources to bail them out.

This scenario partly explains the increasing number of troubled state enterprises since 1995 after the surge of FDI inflow. The command-and-control nature of central planning historically diverted the best resources away from the domestic non-state sector. Since vestiges of this phenomenon described in Section 2 still exist today, most collectively owned town and village enterprises and self-employed enterprises in the non-state sector could only afford to pay an average wage even lower than that in the state sector after fulfilling their other financial obligations. However, most of these constraints did not apply to most other ownership

enterprises, which have been growing rapidly since China adopted an open-door policy to foreign trade and investment.

Multinational firms have not only pushed up wages toward workers' marginal productivity, but they have also introduced a market system for potential employers and employees to exchange their mutual interests. Under the traditional job allocation system that administratively allocated workers to available positions, the state sector in China enjoyed some monopsony power in the labor market and the value of q was close to zero. With the rise in FDI inflow, an active job market in China is gradually emerging. Examples are the newly developed private employment agencies, newspaper job advertisements, job fairs in major universities, and Internet job boards. This emerging job market has changed people's perception and boosted the employment prospective of all firms in the non-state sector, not only the multinational firms.

The analysis shows that FDI can provide more employment opportunities and increase the overall productivity of China's labor force and stimulate economic growth even without bring in any technology transfer. On the other hand, FDI can also cause more competition not only in the product market but also in the labor market, which creates greater challenges to the already troublesome state enterprises due to many other reasons discussed in Gordon and Li (1991). Although more information dissemination of job openings in the non-state sector than in the state sector aggravates this latter shortcoming of FDI inflow, the solution is not to discourage inward FDI or information dissemination of job openings outside the state sector, but to revamp the SOEs to be profit-seeking enterprises in the current economic reform so that they will survive the challenge from the other ownership enterprises and minimize the cost of labor redeployment as China increases its openness to trade and investment after joining the WTO.

To compete for more productive workers, the state sector can implement two types of subsidy policies. One is to increase the amount and duration of subsidy to laid-off workers (w) from former SOEs, such as the services provided by the reemployment centers. This partially offsets the impact of q on each worker's incentive to migrate to the non-state sector. Similarly, the government can increase the subsidy in providing fringe benefits (decrease β) for the SOEs and hence increase B without sacrificing α . However, both of these subsidy policies drain the government's limited resources and cannot be a long-term solution.

There are other more radical policies aimed to provide a long-term solution. One is to reduce p_s by abandoning government job allocation and increasing job opening information flow between state employees and SOEs to increase each worker's chance of getting another job in the state sector once laid off. This decreases a worker's incentive to migrate to the non-state sector and helps to keep high-caliber workers. The reemployment service centers have partly served this purpose. Also, Qian and Xu (1993) and Qian, Roland, and Xu (1998) have studied a new channel of job search in China's state sector through the municipal governments, which have received the delegated responsibilities from the state government to coordinate the layoff and reemployment of SOE workers since 1997. This channel operates like a government-regulated job market for the state sector.

As seen from Table 6, both the placement rate and the recruitment rate have been falling. This could be either because the job seekers do not meet the job qualifications of the potential employers or because there is insufficient information flow between job seekers and potential employees. In response to the first cause, the Chinese government has been working hard on providing more occupational training programs and implementing professional certificate-based systems in every industry to increase the skill of laid-off workers.

In response to the second cause, the government has been trying to hand off career services to the private market. The number of career service centers run by the Department of Labor has been decreasing, and the reemployment service centers for laid-off workers from the SOEs will cease to function at the end of 2003. Our analysis shows that increasing job information flow is as crucial as increasing job seekers' skill in solving the unemployment problem. In particular, from the 2002 First Quarterly Report of the Ministry of Labor and Social Security, 68.18 percent of the employers require workers with at least a senior secondary school diploma, while 75.84 percent of the job-seekers do have a senior secondary school or higher degree. Also, 56.52 percent of the employers require job applicants to have certain certificates indicating their skill levels, while 56.68 percent of the job seekers do have such certificates to prove their qualification. These data further illustrate that more government support is needed to promote job information dissemination after a long duration of the command-and-control system in China's labor market.

5.2 TECHNICAL ASSISTANCE

This section summarizes the findings in the above analysis to provide technical assistance in the labor market, which would benefit the Chinese government in making a smooth transition from a planned economy to an open-market economy. The study advocates implementing favorable policies to promote government and private participation in marketing job openings, investing in information infrastructure, and creating opportunities for new institutions to emerge to reduce labor market transaction cost and facilitate job search.

As China's economic reform deepens, the legal barriers inherited from the command-and-control system in allocating labor to potential employers have become a big obstacle to labor mobility. Yet, these barriers, such as the urban residency permit requirement for many jobs and access to health care and even education in the cities, have protected the well being of urban residents, most of whom are current employees in the state sector. To continue the SOE reform and to facilitate the rural economic reform, it becomes inevitable to eventually abolish these legal barriers of rural to urban migration and privileges of state employees. However, to achieve a smooth transition toward an open-market economy, it is crucial to develop an effective urban labor market for the redeployment of surplus labor during this transition. The analysis suggests the following policy recommendations to achieve this goal.

First is to further encourage and facilitate private involvement in the dissemination of job opening information, for example, by facilitating the operation of private job search centers, job search agents, and Internet job boards. Although a majority of these private advertisements of job openings are from foreign firms, including foreign funded and those funded by entrepreneurs from Hong Kong, Macao, and Taiwan, this job information flow greatly changes people's perception about jobs in the non-state sector in general. These job opening advertisements also provide good examples and an active environment for domestic private firms and town and village enterprises to expand their labor forces. As the number and scale of these private and town and village ownership enterprises increase, the productivity in these enterprises will also increase, and these enterprises can become a prominent source of employment for China's surplus labor.

Second is to increase government's participation in job opening information dissemination. Our analysis shows that increasing job information flow is as critical as

increasing job seekers' skill in the redeployment of China's surplus labor. China did not have a free labor market until the early 1990s, and it takes time and effort to convert the traditional command-and-control system into a job market operated by the "invisible hand."

In particular, the government should make an effort to integrate the government job search agencies and job opening information exchange centers with those in the private network. To establish a free market for labor, there should be no artificial barriers or discrimination between job candidacies and vacancies in the state sector versus those in the non-state sector. An integrated job market will increase the success rate in matching workers with their potential employers and will also increase workers' effort and willingness to participate in training and the overall productivity across sectors in the long term.

Third is to revive the SOEs by abolishing all the social obligations and allow the "non-survivors" to go out of business or to be privatized. Since the state sector still employs about 70 percent of all urban labor, and many SOEs are potentially profitable enterprises, the best strategy is to free the SOEs from their social welfare obligations. This will bring many SOEs from deficits to profits so as to minimize the distortion to the economy and sustain the economic and political stability in the transition from a planned economy to a free market economy.

The last, but certainly not the least, is to provide a nationwide social safety net for the employed as well as the unemployed in both the state sector and the non-state sector to take over the social obligations from the SOEs. The importance of this brings about the conclusion and discussion for future research in the next section.

5.3 FUTURE RESEARCH

Although more job information flow has encouraged more productive workers to seek jobs outside the state sector, facilitating job opening information dissemination is still the key to meet the critical challenge of attaining full employment and sustained economic growth in China. Although our analysis shows that more job opening information dissemination has contributed to lower productivity growth in the state sector, we should not blame more job information flow for the poor performance of the SOEs. Rather, the existing command-and-control system has to change to keep up with the ongoing economic reform in the state sector and more FDI inflow.

One relatively radical approach is to change the fundamental compensation scheme in the state sector. Since 1998, the Chinese government has started to implement a series of policies to provide a broader market-based social welfare system, including health insurance, social security, and unemployment insurance and benefits. The empirical evidence in the previous section has already showed some promising signs of this gradual movement toward completely freeing the SOEs from their social welfare obligations and allowing them to compete equally with other firms in the non-state sector, not just in the product market but also in the labor market. This is the ultimate solution to the problem, although its full benefit to productivity growth and eventually the well being of the majority of the population may not be fully appreciated, while its process may turn out to be quite radical and painful in the short term.

This leads to another promising area of further research on the importance of social safety nets, i.e., schemes supported by society broadly but not tied directly to employment in the state sector, and ways to efficiently allocate workers to jobs while still providing an adequate social guarantee. This research will be of increasing importance, especially in China's accession to the WTO with freer trade and foreign investment commitments.

APPENDIX A

Let $V_i^E(a, b)$ represent the discounted expected lifetime utility (asset-value) of a worker who is currently employed in sector i , $i = s$ for the state sector and $i = n$ for the non-state sector. Let $V_i^S(a, b)$ represent the discounted expected lifetime utility of a worker who is laid off from sector i and is searching for a job. Following Shapiro and Stiglitz (1984), the asset-value equation for a worker who is employed in the state sector can be written as¹²

$$rV_s^E(a, b) = U(\alpha be_s) + \left(a + \frac{1}{p_s + r} \right) B - V(e_s) + p_s [V_s^S(a, b) - V_s^E(a, b)]. \quad (\text{A-1})$$

The asset-value equation for a worker who is employed in the non-state sector is

$$rV_n^E(a, b) = U(be_n) - V(e_n) + p_n [V_n^S(a, b) - V_n^E(a, b)]. \quad (\text{A-2})$$

The asset-value equation for an unemployed worker is

$$rV_s^S(a, b) = U(w) + q [V_n^E(a, b) - V_s^S(a, b)] \quad (\text{A-3})$$

if originally employed in the state sector, and is

$$rV_n^S(a, b) = q [V_n^E(a, b) - V_n^S(a, b)] \quad (\text{A-4})$$

if originally employed in the non-state sector or just entering the labor force.

The intuition of Equation (A-1) is made clear by regarding the discounted expected lifetime utility generated by employment as an asset. $rV_s^E(a, b)$ is then the flow income that is generated by this asset. This is equal to the instantaneous utility adjusted by the capital loss that would be realized if employment were terminated. The capital loss is represented by the expression in brackets, which is then multiplied by p_s , the rate at which losses are realized.

Given a worker's age and level of ability, Equations (A-2) through (A-4) first give the asset-value equations for workers who are currently unemployed,

$$V_s^S(a, b) = \frac{U(w)}{q + r} + \frac{q}{r(p_n + q + r)} (U(be_n) - V(e_n)), \quad (\text{A-5})$$

$$V_n^S(a, b) = \frac{q}{r(p_n + q + r)} (U(be_n) - V(e_n)). \quad (\text{A-6})$$

¹²Because a worker's $V_s^S(a, b)$ is independent of when she enters the unemployment pool in a Poisson process, $V_s^E(a, b) = \int_0^\infty p_s e^{-p_s T} \left[\int_0^T e^{-rt} (U(m_s) + (a+t)B - V(e_s)) dt + e^{-rT} V_s^S(a, b) \right] dT$. tB is the only term that differs from those in Shapiro and Stiglitz (1984) and is the extra fringe benefit that a worker receives if she stays employed in the state sector for another t periods/years. Integration by parts gives Equation (A-1). All remaining asset-value equations are derived similarly.

Substituting these two asset-value equations into Equations (A-1) and (A-2) gives the asset-value equations for workers who are currently employed,

$$V_s^E(a, b) = \frac{1}{p_s + r} \left\{ U(\alpha b e_s) + \left(a + \frac{1}{p_s + r} \right) B - V(e_s) + p_s V_s^S(a, b) \right\}, \quad (\text{A-7})$$

$$V_n^E(a, b) = \frac{q + r}{r(p_n + q + r)} (U(b e_n) - V(e_n)). \quad (\text{A-8})$$

A worker chooses $e_s(a, b)$ to maximize $V_s^E(a, b)$ in Equation (A-7) if employed in the state sector and $e_n(a, b)$ to maximize $V_n^E(a, b)$ in Equation (A-8) if employed in the non-state sector taking α and B as given. The following first order conditions give the implicit solutions for e_s^* and e_n^* .

$$\alpha b U'(a b e_s^*) = V'(e_s^*) \quad (\text{A-9})$$

$$b U'(b e_n^*) = V'(e_n^*) \quad (\text{A-10})$$

As $\alpha \leq 1$, $e_n^* \geq e_s^*$ for all workers if $U'(a b e_s^*) \geq -a b e_s^* U''(a b e_s^*)$, which is more likely to hold for low levels of α , b , or e_s^* . Like in Gordon and Li (1999), the following analysis assumes that this condition holds. The empirical section will show this condition holds together with the other assumptions mentioned later in this section by testing the first hypothesis H1.

e_n^* increases only with a worker's ability, and is independent of age, the discount rate, the probability of being laid off in either sector, and the probability of getting a new job. The same is true for e_s^* . However, e_n^* is also independent of α while e_s^* increases with α . Thus, we can rewrite the solutions to Equations (A-9) and (A-10) as $e_s^*(b, \alpha)$ and $e_n^*(b)$, respectively.

Given each worker's optimal choice of effort, $e_s^*(b, \alpha)$ and $e_n^*(b)$, a worker employed in the state sector determines whether she wants to search for a job in the non-state sector. There is no loss of generality to assume that the search cost is zero. The probability of successfully migrating to the non-state sector in the same period is q . Therefore, a worker wants to leave the non-state sector if

$$q(V_n^E(a, b) - V_s^E(a, b)) > 0. \quad (\text{A-11})$$

Substituting in Equations (A-7) and (A-8) and evaluating the above condition at the optimal effort levels determined by Equations (A-9) and (A-10) gives

$$\frac{p_s + q + r}{p_n + q + r} [U(be_n^*) - V(e_n^*)] > \left[U(\alpha be_s^*) + \left(a + \frac{1}{p_s + r} \right) B - V(e_s^*) + \frac{p_s U(w)}{q + r} \right]. \quad (\text{A-12})$$

Since e_s^* and e_n^* do not depend on r , p_s , p_n , and q , for workers with the same ability (b), there is a cut-off age $\underline{a}(b)$ so that all workers younger than $\underline{a}(b)$ search for a job in the non-state sector and successfully migrate to the non-state sector with probability q in each period, and all those older than $\underline{a}(b)$ stay in the state sector.

$$\underline{a}(b) = \frac{1}{B} \left\{ [U(be_n^*) - V(e_n^*)] - \left[U(\alpha be_s^*) - V(e_s^*) + \frac{p_s U(w)}{q + r} \right] \right\} - \frac{1}{p_s + r} \quad (\text{A-13})$$

If the age of the youngest worker who is willing to stay in the state sector is non-positive, i.e., $\underline{a}(b) \leq 0$, then all workers want to stay in the state sector. Let $\underline{a}(b) = 0$ in the following calculation. If the age of the youngest worker who is willing to stay is greater than one, i.e., $\underline{a}(b) \geq 1$, then all workers want to seek a job in the non-state sector. Let $\underline{a}(b) = 1$ in the following calculation.

Finally, substituting each worker's choice of effort, $e_s^*(b, \alpha)$ and $e_n^*(b)$, and the minimum age \underline{a} for each group of workers with ability b into Equation (A-7) gives the government's objective function (4) in the main text. The budget constraint (3) becomes (5) in the main text. From (5),

$$B = \frac{2(1-\alpha)}{\beta} \frac{\int_0^1 (1 - q\underline{a}(b; \alpha)) b e_s^*(b, \alpha) db}{\int_0^1 1 - q\underline{a}(b; \alpha)^2 db}. \quad (\text{A-14})$$

Substituting the above expression for B into (4) in the main text, the government officials' maximization problem is left with only one choice variable α .

Evaluating the first order condition of the above maximization problem at Equations (A-9) and (A-10) gives that α satisfies

$$\left\{ q \left(U(\alpha be_s^*) - V(e_s^*) + p_s V_s^S + \frac{B}{p_s + r} + \underline{a}(b) B \right) + 1 - q\underline{a}(b) \right\} b e_s^* U'(\alpha be_s^*) + \left(\frac{1 - q\underline{a}(b)}{p_s + r} + \frac{1 - q\underline{a}(b)^2}{2} \right) \frac{dB}{d\alpha} = 0, \quad (\text{A-15})$$

where $dB/d\alpha$ is derived from Equation (A-14). From budget constraint (3), $dB/d\alpha$ is negative at any given e^* and A . However, α increases the incentive of each worker in the state sector to spend more effort and also to stay in the state sector, i.e. e_s^* increases and $\underline{a}(b)$ decreases, both increase the total budget to spend on wage and fringe benefit. The following analysis assumes that these secondary effects will not dominate the initial trade-off between α and B so that $dB/d\alpha < 0$ and first order condition Equation (A-15) gives an interior solution of $0 < \alpha^* < 1$.¹³ B^* is given by substituting α^* into Equation (A-14).

¹³Following the analysis in Gordon and Li (1999), we assume that parameters fall in the range so that the second-order condition for a maximum is satisfied.

REFERENCES

- Aghion, P., and Blanchard, O. (1994). On the Speed of Transition in Central Europe. *NBER Macroeconomics Annual*, 283-319.
- Aghion, P., and Blanchard, O. (1998). On Privatization Methods in Eastern Europe and Their Implications. *Economics of Transition*, 6(1):87-99.
- Bane, M. J., and Ellwood, D. T. (1994). *Welfare Realities: From Rhetoric to Reform*. Cambridge: Harvard University Press.
- Basu, S., Estrin, S., and Svejnar, J. (1994). Employment and Wage Behavior of Enterprises under Communism and in Transition: Evidence from Central Europe and Russia. *Mimeo*, McGill University.
- Blanchard, O. (1997). *The Economics of Transition in Eastern Europe*. Clarendon Lectures, Oxford, UK: Oxford University Press.
- Blanchard, O. Dornbusch, R., Krugman, P., Layard, R. and Summers, L. (1991). *Reform in Eastern Europe*. Cambridge, MA: MIT Press.
- Blanchard, O., and Kermer, M. (1997). Disorganization. *Quarterly Journal of Economics*, 112(4), 1091-1126,.
- Bolton, P. (1995). Privatization and the Separation of Ownership and Control: Lessons from Chinese Enterprise Reforms. *Economics of Transition*, 3, 1-12.
- Che, J., and Qian, Y. (1998a). Institutional Environment, Community Government, and Corporate Governance: Understanding China's Township-Village Enterprises. *Journal of Law, Economics and Organization*, 14(1), 1-23.
- Che, J., and Qian, Y. (1998b). Insecure Property Rights and Government Ownership of Firms," *Quarterly Journal of Economics*, 113(2):467-96,.
- Commander, S., and Coricelli, F., (eds.). (1995). *Unemployment, Restructuring, and the Labor Market in Eastern Europe and Russia*. EDI Development Studies. Washington, DC: The World Bank.
- Davidson, C., and Matusz, S. J. (2000a). Globalization and Labor Market Adjustment: How Fast and at What Cost? *Oxford Review of Economic Policy*, forthcoming.
- Davidson, C., and Matusz, S. J. (2000b). Globalization, Employment, and Income: Analyzing the Adjustment Process. In D. Greenaway (ed.), *Proceedings of the IEA Conference on Globalization and Labor Markets*. Macmillan, forthcoming.

- Gordon, R. H., and Li, D. (1999). The Effects of Wage Distortions on the Transition: Theory and Evidence from China. *European Economic Review*, 43(1) (January), 163-83.
- Gordon, R. H., and Li, W. (1991). Chinese Enterprise Behavior under the Reforms. *American Economic Review*, 81(2) (May), 202-06.
- Groves, T., Hong, Y., McMillan, J., and Naughton, B. (1994). Autonomy and Incentives in Chinese State Enterprises. *Quarterly Journal of Economics*, 109(1), 183-209.
- Groves, T., Hong, Y., McMillan, J., and Naughton, B. (1995). China's Evolving Managerial Labor Market. *Journal of Political Economy*, 103(4), 873-92.
- Jin, H., and Qian, Y. (1998). Public vs. Private Ownership of Firms: Evidence from Rural China. *Quarterly Journal of Economics*, 113(3), 773-808.
- Lau, L., Qian, Y., and Roland, G. (2000). Reform without Losers: An Interpretation of China's Dual-Track Approach to Reforms. *Journal of Political Economy*, 108(1), 120-43.
- Li, W. (1997). The Impact of the Chinese Reform on the Performance of Chinese State-Owned Enterprises, 1980-89. *Journal of Political Economy*, 105(5), 1080-106.
- Masking, E., Qian, Y., and Xu, C. (2000). Incentives, Information, and Organizational Form. *Review of Economic Studies*, 67(2) (April), 359-78.
- McMillan, J., Whalley, J., and Zhu, L. (1989). The Impact of the Chinese Reform on Agricultural Productivity Growth. *Journal of Political Economy*, 97(4), 781-807.
- Munich, D., Svejnar, J., and Terrell, K. (1998). The Worker-Firm Matching in Transition Economies: (Why) Are the Czechs More Successful Than Others? *William Davidson Institute Working Paper*, 107.
- Qian, Y., Roland, G., and Xu, C. (1999). Why Is China Different from Eastern Europe? Perspectives from Organization Theory. *European Economic Review*, 43 (April), 1085-94.
- Qian, Y., Roland, G., and Xu, C. (1998). Coordinating Changes in M-Form and U-Form Organizations. *Mimeo*. European Center for Advanced Research in Economics and Statistics, Université Libre de Bruxelles.
- Qian, Y., and Xu, C. (1993) Why China's Economic Reforms Differ: The M-Form Hierarchy and Entry/Expansion of the Non-State Sector. *Economics of Transition*, 1, 135-70.
- Rodrik, D. (1995). The Dynamics of Political Support for Reforms in Economies in Transition. *Journal of the Japanese and International Economies*, 9(4), 403-425.

- Roland, G. (2000). *Transition and Economics: Politics, Markets, and Firms*. Cambridge, MA: The MIT Press.
- Roland, G., and Sekkat, K. (forthcoming). Managerial Career Concerns, Privatization and Restructuring in Transition Economies. *European Economic Review*.
- Shapiro, C., and Stiglitz, J. E. (1984). Equilibrium Unemployment as a Worker Discipline Device. *American Economic Review*, 74(3) (June), 433-44.
- State Statistical Bureau. (2000). *China Foreign Economic Statistical Yearbook*. China Statistics Press.
- State Statistical Bureau. (2000). *China Labor Statistical Yearbook*. China Statistics Press.
- State Statistical Bureau. (2000–2001). *China Statistical Abstract*. China Statistics Press.
- State Statistical Bureau. (1994–2001). *China Statistical Yearbook*. China Statistics Press.
- State Statistical Bureau. (2001). *Major Figures on 2000 Population Census of China*. China Statistics Press.
- United Nations Conference on Trade and Development (UNCTAD). (1999). *World Investment Report 1999: Foreign Direct Investment and the Challenge of Development*. New York and Geneva: United Nations.
- United Nations Development Program (UNDP). (1999). *China Human Development Report: Transition and the State*. New York: Oxford University Press.
- United Nations Development Program (UNDP). (1997). *China Human Development Report: Human Development & Poverty Alleviation*. New York: Oxford University Press.
- Weitzman, M., and Xu, C., (1993). Chinese Township and Village Enterprises as Vaguely Defined Cooperatives. *Journal of Comparative Economics*, 18, 121-45.
- Wu, X. (2001a). The Impact of Foreign Direct Investment on the Relative Return to Skill. *Economics of Transition*, 9(3) (November), 695-715.
- Wu, X. (2001b). Foreign Direct Investment, Intellectual Property Rights, and Wage Inequality in China. *China Economic Review*, 11, 361-84.