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Social Stability and Efficiency Wages:
The Case
in the Context of the Chinese Labour Market

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Business Studies in Economics
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To my son Alfred (Yuxin) as my special gift for his one year old birthday

Abstract

Chinese gradual and piecemeal reform has generated dual labour market sectors: the state sector vs. the non-state sector. One important feature of reforms in the state sector is that balancing the objective of maintaining social stability against that of improving productivity is highlighted. In this thesis I suggest that this trade-off is inherent in the policy of *xiagang* which allows state owned enterprises to layoff workers but forces them to continue providing some wages and non-wage benefits.

The aim of this thesis is to examine the relationship between social stability and a range of variables such as wages, effort levels, employment, output, productivity and profitability. To fulfill it, this thesis builds a theoretical model that extends the Shapiro and Stiglitz no-shirking efficiency wage model to include characteristics of the Chinese context. The most important innovation in this model is the introduction of a social stability parameter that reflects some key features of *xiagang* such as a low likelihood of workers being laid off. The likelihood of layoffs could be lowered in the interest of social stability.

A comparative static analysis is undertaken on this model. It shows that with an increase of this social stability parameter, the overall wages, unskilled worker's effort levels and their employment tend to rise, but the overall profit levels and skilled worker's effort levels tend to decline; Skilled worker's employment, the overall output and productivity may either increase or decrease. This implies that profitability may be improved by lowering the social stability parameter, but that improvement is more likely to be realised through cutting labour costs at an expense of shifting more workers into *xiagang* rather than through improving the overall productivity.

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Abbreviations

The following abbreviations are used in this thesis:

CRS	The Contract Responsibility System
LMP	Labour's Marginal Productivity
NSC	No-Shirking Condition
NSOEs	Non-state owned enterprises
RMB	Renminbi (China's currency name)
SOEs	State owned enterprises
TFP	Total Factor Productivity
TVPs	Township and village enterprises
The S-S model	Shapiro and Stiglitz no-shirking efficiency wage model
VMP	Value of Marginal Productivity

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Chapter 1: Introduction

In the transition from a planned to a market economy, China has embarked on piecemeal and gradual economic reform since 1978. During the reform period, China achieved the fastest economic growth of any national economy, averaging nearly 10 percent per year (Lardy, 1998). By contrast with the successful story of China's piecemeal and gradual economic reform, 'big bang' style's reforms in Eastern European countries and the former Soviet Union seem to have resulted in economic turmoil.

The so-called piecemeal and gradual reform in China generates a dual labour sector, e.g., the state sector vs. the non-state sector. For the state sector, an important feature of its reforms is that balancing the objective of maintaining social stability against that of improving productivity is highlighted (Fan, *et. al*, 1998). The government reforms it *gradually*. For the non-state sector, the government encourages it in a dynamic expansion (Fan, 1998).

During the course of the Chinese piecemeal and gradual reform, the Chinese government committed itself to preventing massive unemployment in the state sector as a basic policy and as a means of maintaining social stability (Fan, *et. al*, 1998). That is due to a belief that substantial unemployment from the state sector may trigger social unrest, particularly in the case of China where a social safety net is not yet well established. In the state-sector, the social welfare of workers, such as wages, medical care and accommodation services, entirely relies on their enterprises. In other words, workers who lose their jobs from their enterprise will subsequently lose their security of social welfare. This means that before the establishment of a social safety net, to simply lay off workers in the state sector as in usual market economies would not be desirable.

Nevertheless, the Chinese government is now becoming more and more aware of poor improvement of productivity and continued deteriorated profits in state-owned enterprises. It could be expected that if this tendency can not be reversed, more and more state-owned enterprises would be pushed to the edge of bankruptcy and social unrest would inevitably be triggered.

Improving productivity may be achieved by different measures. One of which is to improve worker's on-the-job effort. The framework of efficiency wage theories highlights the importance of effort levels. The theories suggest that higher wages tend to stimulate workers to put in higher effort levels. However, the literature shows that in reality increases of the payroll in the Chinese State sector do not result in commensurately increases in labour productivity (Fan, et. al., 1998).

A significantly growing number of studies, from various perspectives, attempt to account for why the improvement of productivity in state-owned enterprises is slow and their profits continue to deteriorate. However, so far little work has been done from the perspectives of efficiency wage theories, apart from the work of Lu and Cheng's (1998) and Li's (1997).

It is important to look at efficiency wage theories *in* the Chinese context because of *xiagang* policy. *Xiagang* in Chinese means 'left-post', which is a system where redundant workers in SOEs retain their position with the enterprise and part of their wage without having to work. *Xiagang* workers can continue to get minimum subsistence wages and welfare benefits, such as medical care and accommodation services, from their enterprise, unless they go to work in the non-state sector. In the state sector, workers who do not meet effort requirements are shifted to *xiagang*, but in the non-state sector they are dismissed entirely without income. Therefore, the cost to the workers of being shifted to *xiagang* in the state sector is not as high as the cost of dismissal in the non-state sector. However, the effectiveness of *xiagang* as a means of punishing shirking workers in state-owned enterprises should not be overlooked.

In the light of efficiency wage theories, Lu and Cheng examine and compare the difference of SOEs' workers' effort levels under two circumstances. One circumstance is when the operation of SOEs is with the constraints of limitation to the internal wage gap between on-the-job and *xiagang* workers and/or to the scale of *xiagang* workers. Another circumstance is when SOEs operate without any other constraints, apart from with *xiagang* workers. In addition, they also compare the difference of effort levels between workers in SOEs and NSOEs that are assumed to operate without those constraints as SOEs have.

Lu and Cheng's model assumes that workers' effort levels in SOEs only depend on the internal wage gap between on-the-job and *xiagang* workers. From my point of view, this assumption is too simplified and is inconsistent with reality. For example, the literature suggests that the worker's effort level in the state sector is also influenced by the wage level and unemployment rate in the non-state sector (Li, 1997). Another major deficiency of Lu and Cheng's model is that the heterogeneity of workers is entirely overlooked.

In the light of the basic implication of efficiency wage theories, Li (1997) elaborates his model, by using conventional demand and supply curves for both skilled and unskilled workers, aiming at exploring why productivity in state-owned enterprises is relatively low. However, Li's model does not take some substantial ingredients of the Chinese labour market, such as the emergence of '*xiagang*' in state-owned enterprises, into account. The emergence of *xiagang* means that either skilled or unskilled workers in the state sector now inevitably suffer some costs in the case of *xiagang*, rather than having nothing to lose as claimed by Li.

The purpose of this thesis is to enhance our comprehension of the relationships between maintaining social stability and a range of variables such as efficiency wages, effort, employment, output, productivity and profitability from the perspective of no-shirking efficiency wage theories with a new theoretic depth and breadth. This requires a theoretical model to be developed that is relevant to the context of the Chinese labour market. Efficiency wage models consist of at least five separate versions (Riveros and Bouton, 1994), however, in this thesis only the Shapiro and Stiglitz no-shirking efficiency wage model is used because it is the most fully developed efficiency wage approach in the literature. This model is extended to include features relevant to the Chinese context including a concern with social stability.

Additionally, it is important to classify workers, according to the differences of their working skills and attitudes towards risks, into two contrasting types, the skilled vs. the unskilled. This makes it possible to examine different effort behaviors of skilled and unskilled workers in response to any changes of exogenous elements. For example, the literature shows that skilled workers tended to flow from the state

sector into the non-state sector, but unskilled workers did the reverse, when the non-state sector emerged in China (Dai and Li, 1991, and Li, 1997). Therefore, the model developed here takes into account some forms of workers' heterogeneity to ensure the analysis is consistent with reality.

An important innovation in my model is the introduction of a social stability parameter to reflect the likelihood of workers being shifted to *xiagang*. This is an exogenous parameter, which can be manipulated by the government for the sake of maintaining social stability. Analyzing the relationship between the social stability parameter and workers' efficiency wages, effort levels, employment levels, output, productivity and state enterprises' profitability highlights some important trade-off.

The structure of this thesis is as follows. Chapter 2 reviews the overall reform of the Chinese labour market and evidence on changes of workers' wage levels, effort levels, productivity and profitability in SOEs during the reform period. Chapter 3 examines the merits and limitations of the Shapiro and Stiglitz no-shirking efficiency wage model, and also reviews efficiency wage theories' applications in the Chinese context by Li (1997) and Lu and Cheng (1998). Chapter 4 establishes a basic model, and undertakes a comparative static analysis on the relationship between the social stability parameter and a range of variables such as workers' wages, effort levels, employment, output, productivity and profitability in the state sector. Chapter 5 then offers conclusions.

Chapter 2: A Review of Chinese Labour Markets in the Transition

2.1 Introduction

This chapter attempts to review reforms in Chinese labour markets during the past two decades. The changes in Chinese labour markets within the past two decades are complex. It is impossible to cover every aspect here. I focus on reviewing some important aspects that relate to the theme of this thesis.

This chapter consists of four parts.

First, it reviews the pre-reform Chinese labour system in Section 2.2. The review shows common properties and variation between the Chinese urban labour segment and the Chinese rural labour segment. It suggests that the pre-reform Chinese labour system had an extremely egalitarian wage structure and immobility of labour system, and carried out a policy of full employment. These policies severely undermined a direct link between individual effort and reward/penalty. It is very tricky to change such a highly centrally regulated and rigid labour system to a market-oriented labour system in a short run. This basic state of China implies that *piecemeal and gradual*, rather than *radical*, reforms in the Chinese labour market are likely to be the best option. Piecemeal and gradual reforms highlight the importance of balancing the objective of maintaining social stability against that of improving productivity (Fan, *et. al.*, 1998).

Second, it reviews the emergence of a dual labour sector in Chinese labour markets, i.e.: the state sector vs. the non-state sector in Section 2.3. It emphasizes the importance to implement a series of reform measures in the state sector in an increasingly competitive environment. It examines the overall reform process and major reform measures that have been implemented in the state sector, particularly the emergence of '*xiagang*'.

Thirdly, Section 2.4 reviews progress and prospects of Chinese labour market reforms in the state sector. It examines the progress of Chinese labour market reforms and compares the productivity improvement in the state sector with that in the non-state sector. It suggests that the improvement of productivity in SOEs is relatively low. Perhaps, the reasons behind it are complicated, but some literatures suggest the trade-off between maintaining social stability and improving productivity may contribute to it (Fan, 1998, Lu and Cheng, 1998). This is one of the most important issues that my thesis aims to investigate in Chapter 3 and 4.

Finally, Section 2.5 offers conclusions.

2.2 A Review of the Pre-reform Chinese Labour System

2.2.1 Basic Characteristics of the Pre-reform Chinese Labour System

In 1949 under the leadership of Mao Zedong (Tse-Tung), the Communist Party took control of Mainland China. During the next more than two decades (1949-1976), the Chinese undertook a massive socialist economic experiment, the extent of which is regarded to be unrivaled by other socialist countries in scope or scale (Madden, 1998). The basic framework of the planned economy was set up, under Soviet tutelage, during the First Five-Year Plan (1953-57) and thereafter remained largely intact until fundamental reform began to take place in 1978 under the leadership of Deng XiaoPing.

The pre-reform Chinese labour system was highly centrally regulated and controlled under the framework of a planned economy. Before reform, the Chinese labour system was arbitrarily separated into two segments: One was the Chinese rural labour system and another one was the Chinese urban labour system. Mobility of labour force between two segments was severely restricted by the government through a series of measures, for the purpose of securing social stability and zero open unemployment. One of the major measures was the *hukou* (the residential registration) system (Knight and Song, 1995). For people born in rural areas, it was

very difficult, if not impossible, to get jobs in urban areas, because they had only rural *hukou*, which meant they were not allowed to live and work in cities.¹

Another important restriction impeding rural labour from working in urban areas was the rationed provision of consumer goods such as food and housing, for urban residents (Fan *et. al.*, 1998). Urban residential registration and consumer goods rations were administered by the same government office. That meant that even if peasants moved to urban areas, it was very difficult to survive in the absence of markets providing them with basic consumer goods.

In sum, rural and urban segments in China were arbitrarily insulated. Labour mobility between rural and urban segments was stringently restricted and controlled by the government. We now look at each of these in turn.

2.2.2 The Characteristic of the Pre-reform Chinese Rural Labour Segment

Pre-reform, peasants were organized into production team based on their born locality under the commune system. The commune ensured that everyone had the right to work and earn income based on a 'work points' system, which allocated work points to peasants equally within the commune (Li, 1996 and Fan, *et. al.*, 1998). This meant that the link between individual effort and reward was weak, which may result in peasants' shirking, absenteeism, and carrying out personal affairs during work hours.

Peasants were not only successfully restricted from moving, but also prevented from being openly unemployed. People in rural areas had to live on peasants' sole income sources e.g.: 'work points' without provision of other social welfare such as free housing and medical care, from the government. The rural labour force increased drastically from 182 million in 1949 to 438 million in 1992 (see table 1), but land was already fully occupied in 1952 and its use could not be expanded significantly

¹ The officially possible channels for people with rural *hukou* to transform into urban *hukou* include: graduating from colleges/universities, joining army and retiring from army as officer, marrying with urban resident etc. Anyway, these channels only grant very few proportional rural labors with opportunities.

(Knight and Song, 1995). Therefore, the life of people in Chinese rural areas was poor and the disguised unemployment was very serious.

Table 1. *Chinese Rural Labour Force Change, 1952-92 (million)*

Year	Rural Labour Force
1952	182
1962	214
1972	287
1982	339
1992	438

Sources: *Statistical Yearbook of China 1993*, Beijing, China Statistical Publishing House

2.2.3 The Characteristic of the Pre-reform Chinese Urban Labour Segment

In contrast to rural areas, under the pre-reform urban labour system, urban workers were bureaucratically assigned to enterprises after they grew up and worked there for a lifetime. All enterprises were owned by the state.² The Chinese government was obligated to provide every urban resident with a job, because in terms of Mao's ideology unemployment in the socialist new China was intolerable and not allowed.³ Therefore, urban labour demand and supply were regulated through the planning system. The labour recruitment of each enterprise was based on the plan, which was adjusted to avoid urban unemployment from the perspective of the government. Additionally, since enterprises pursued fulfillment of production quotas rather than maximum profits as in a market economy, they were encouraged to hoard labour to ensure fulfillment of production quotas regardless of efficiency (Maurer-Fazio, 1995).

Beyond that, all urban residents eligible for work were not only ensured of lifetime jobs, but they were also offered almost equal wages.⁴ An extremely egalitarian wage

²Before reform, Chinese enterprises consisted of two types: one was state-owned and another one was collective. However, both of them were owned by the state, not the private. The latter were usually owned and governed by the local governments.

³ That everyone has and participates in work was pursued and regarded as superior characteristics of socialism in terms of Maoism.

⁴ The pre-reform the wage rate of Chinese workers was regulated into eight grades mainly in terms of seniority. Elder workers usually received higher wages, but anyway the gap between grades was minor

structure was laid down for all enterprises, with only slight regional (cost of living) and industrial variations. This kind of egalitarian wage structure reduced workers' incentives to move, and hence reduced mobility of labour either within the same segment or between two different segments. It also weakened direct links between individual effort and reward/penalty and a positive relation between an individual's skill and reward, in terms of human capital theories, was distorted.

All urban workers were equally provided with social welfare including the provision of housing, education, medical care, and pensions, regardless of performance. It is important to note that this social welfare was provided by enterprises to their workers rather than by a national safety net or organization and so was conditional on being allocated to an enterprise. This means that once a worker left his or her enterprise, he or she would no longer be able to obtain social welfare from this enterprise. This would also tend to reduce mobility of labour either within the same segment or between two different segments.

Mobility of labour among enterprises was also rigidly controlled and restricted: the first job was usually the last. Thus, a system of lifetime employment within the enterprise was created, giving employees an 'iron rice bowl'. 'Iron rice bowl' is called '*Tiefanwan*' in Chinese. It has at least two implications. First, it implies that a worker's job in the state sector is always secured regardless of performance, unless the worker commits a crime. Second, it implies that a worker's first job is usually his or her last one. It is hard for him or her to involuntarily change a job.

The 'iron rice bowl' system failed to motivate workers to work hard. Rather, it only discouraged workers to put in effort because it broke the link between individual effort and reward/penalty. The literature asserts that shirking, absenteeism, and carrying out personal affairs during work hours were common occurrences during the pre-reform period in the state sector (Maurer-Fazio, 1995).

Overstaffing and underemployment was another major feature of the pre-reform Chinese labour system. It was partially due to that the Chinese government pursued

in relation to in market economies. More details may be referred to the literature (Korzec, 1992, and Meng and Kidd, 1997).

full employment as a basic policy of the state. The literature argued that ‘in an underdeveloped economy with the world’s largest population, full employment was an impossible goal and what was achieved was only an “iron rice bowl” system, meaning “on-the-job under-employment” for both the industrial labour force and the rural labour force’ (Fan *et al.*1998). That SOEs pursued maximizing production quota rather than profits also contributed to overstaffing and underemployment. In addition, the Chinese government’s long-term economic development strategy, which over-emphasized the development of capital-intensive industry, intensified overstaffing and underemployment in the state sector (Fan, *et. al.*, 1998 and Yeh, 1996).

The pre-reform Chinese government never gave up its unrealistic objective of ‘jobs for everyone’ (full employment). Rather, they resorted to all possible means to attempt to attain this objective. For example, in 1960s they shifted hundreds of thousands of just graduated youths from high schools to remote rural areas as temporary or permanent peasants. This was ever called ‘*Shangshan Xiaxiang Yundong*’ in Chinese. The aim of which was to disguise open unemployment in urban areas.

Another important means that they resorted to was to freeze workers’ wages. This may save labour costs to create more job opportunities (Korzec, 1992). For instance, workers’ wages remained intact from 1964 until 1979 when reform took place. This meant that during the overall 15 years, workers’ wages did not increased at all along with increases of output per capita. See table 2 on the next page for a change of output per capital from 1962 to 1980 while workers’ wages remained intact. Newly created job opportunities may help mitigate increasing pressures of ensuring full employment in urban areas, but low wages may also greatly lower incumbent worker’s effort levels and productivity.

It is important to note that these means only temporarily mitigated or disguised the unsustainable contradiction of job seekers in excess of job vacancies in urban areas, but did not virtually resolve it. Rather, this has made labour productivity lower and reforms more difficult in future.

Table 2. *Average Annual Growth Rates, GNP and Population, 1962-80 (%)*

Period	GNP	Population	GNP per capita
1962-65	15.1	2.5	4.2
1965-70	6.9	2.7	4.2
1970-75	5.7	2.2	3.5
1975-80	6.5	1.3	5.2

Sources: State Statistical Bureau, *Qiwu shiqi guomin jingji he shehui fazhan Gaikuang (National Economic and Social Development during the Seventh Five-Year Period)* (Beijing, 1991), pp.27, 188; State Statistical Bureau, *China Statistical Yearbook 1990* (Beijing, 1991), p. 5; *Beijing Review*, 2-8 Oct., 1989, p. 20.

In sum, the pre-reform Chinese labour system severely hindered mobility of labour between two segments, and within the same segment or city and/or industry. The stringent government's regulations like *hukou* system, an extremely egalitarian wage structure, the 'iron rice bowl' system and a unique social welfare system contributed to immobility of labour. Immobility of labour eliminated competition in the Chinese labour system. Firms were unable to employ desirable workers and lay off undesirable workers with their own discretion. Either, workers were unable to voluntarily choose desirable jobs. The absence of competition in turn reduces pressures on managers and workers in SOEs to perform efficiently. Shirking, absenteeism, and carrying out personal affairs during work hours result.

2.2.4 A Brief Comparison between the Rural Labour System and the Urban Labour System

The similar or common properties of the two segments may be summarized as follows:

- (1) Mobility of labour either between two segments or within the same segment is rigidly controlled and restricted, and the first job is usually the last one;
- (2) 'Jobs for everyone' employment policy is pursued at the expense of an accumulated large sum of disguised unemployment created;
- (3) The 'iron rice bowl' policy was instituted and everyone was paid equally regardless of performance;
- (4) An employee could not be laid off for any reasons other than he or she committed a crime;

(5) The link between individual effort and reward/penalty was weak. Shirking, absenteeism, and carrying out personal affairs during work hours were common occurrences.

The variation between the two segments is summarized as:

(1.) Urban citizens were born with the right to work in an urban unit, but in principle rural citizens were not allowed to be employed in an urban unit;

(2.) Urban workers received wages and a large range of social welfare from the provision of housing to pensions from their enterprises, but peasants only relied on 'work points';

(3.) Both living standards and working conditions were much better for workers in urban areas than peasants in rural areas.

2.2.5 Summary

This sector has reviewed the pre-reform Chinese labour system. The labour system was characterized by state direction of labour, immobility of labour, lack of material incentives and a basic social safety net, overstaffing, and underemployment. All of these features severely undermined the link between individual effort and reward/penalty. Shirking, absenteeism, and carrying out personal affairs during work hours were common occurrences. This suggests that if the government wants to improve worker's productivity in the state sector, they have to reform the labour system. Meanwhile, we may expect that how tricky it is to change such a rigid and cumbersome socialist labour system to a market-oriented labour system in a short run. Based on this, it is not difficult to understand why China has chosen a policy of gradual and piecemeal reform in the Chinese labour system rather than of radical one.

2.3 A Review of Reforms in the Chinese Labour Market

2.3.1 The General Characteristics of China's Reforms and the Emergence of a Dual Labour Sector in China during the Post-reform Period

Since 1978, China, under the predominant leadership of Mr. Deng Xiaoping, has embarked on piecemeal and gradual reform, which is in contrast with 'big bang' style' reforms undertaken in Eastern European countries and the former Soviet Union. There is an extensive literature examining why China adopted a reform path absolutely different from other former socialist countries and which style of reform is superior (Hussain, 1994; McMillan and Naughton, 1993; Sachs and Woo; 1994, Li, 1996 and Jin and Haynes, 1997). Most authors have noted that Chinese reforms have resulted in unprecedented and unparalleled economic growth, but in contrast, reforms in Eastern Europe and the former Soviet Union have been accompanied by economic recession and political problems. See table 3 for a comparison of economic growth between China and selected Eastern Europe countries from 1986 to 1992.

The outstanding achievement of China's economic growth during the post-reform period suggests that the piecemeal and gradual style of reform is adequate and successful. What are some of the salient Characteristics of the Chinese piecemeal and gradual reform? In general, there are two main features (Bell *et. al.*, 1993).

Table 3. Annual Economic Growth (% per annum) Comparison between China and Selected Eastern Europe Countries

	China	Russia	Romania	Bulgaria
1986-89	8.7	2.4	-0.9	5.2
1990	4.1	-2.0	-7.1	-11.6
1991	8.2	-9.0	-13.4	-22.7
1992	13.4	-19.0	-10.2	-7.9

Sources: quotation and extraction from Li's (1996) Table 1

Notes: Output measure is Gross National Product for China, Net Material Product for Russia, and Gross Domestic Output for other countries.

First, the reforms were undertaken primarily on an experimental basis in some localities before they were applied to the whole country. There are several advantages: 1. Major disruptions to the economy were avoided; 2. A primarily successful experiment built up political support for further reform. 3. It is conducive to allowing time to build new institutions, legal and regulatory frameworks and train personnel to adapt to new practices; 4. The administrative apparatus of the planning system would continue to be available, albeit with diminishing effectiveness. This feature was particularly important in avoiding social unrest and political conflicts that could derail the whole reform process.

Second, intermediate mechanisms (hybrid institutions) were used to smooth the transition between two different economic systems to avoid drastic disruptions that could result from an abrupt shift. Typical examples were that a dual-track pricing system was established in order to improve the allocation of resources at the margin. Corresponding to the dual-track pricing system, a dual labour sector was created: the state sector vs. the non-state sector. On the one hand, the Chinese government can preserve the socialist character of the economy within the state sector, which includes avoiding massive privatization and unemployment as in some of the transitional economies of Eastern Europe and the former Soviet Union. But the concept of socialism is limited to the dominance of public ownership and control of strategic sectors in the economy. On the other hand, the government advocates and promotes the development of the non-state sector. This sector is defined to include individual and private businesses, foreign-funded enterprises, and joint-ownership enterprises. The rapid growth of the non-state sector has strengthened the economy and has facilitated efforts to transform the traditional state sector.

In the state sector, the state still governed labour supply and demand. The centralized control of enterprises provided no inducement for the efficient use of labour, and indeed surplus labour was still imposed on enterprises. Workers had few incentives to work hard as they still permanently occupied traditional privileges like 'iron rice bowl', equal wages and social welfare regardless of performance. In one word, it initially almost inherited the mantle of the old system.

On the contrary, another new emerging sector---the non-state sector run under the framework of market, whereas market wages governed labour supply and demand. Enterprises may freely lay off surplus workers and shirking workers.⁵ Workers were not provided with social welfare by either enterprises or the state, and their wage rates were determined by competitive markets and subject to their performance instead of subject to administrative wage regulations as in the state sector (Knight and Song, 1995).

Gradual and piecemeal reforms in Chinese labour markets imply that a dual-sector system will exist in China for a long time. Perhaps this has prompted the overwhelming research interest in China's reforms from academic economists and international agencies at home and overseas (Walder, 1996, Nolan and Ash, 1996). This feature is necessarily borne in mind throughout this thesis.

2.3.2 Reviews of Major Chinese Labour Market Reform Policies in the State Sector

Reforms on Employment Policies in the State Sector

Since 1978, a series of reform measures in the labour field have been introduced into the state sector. They basically aimed to strengthen the link between individual effort and reward, to diminish shirking, absenteeism, and carrying out personal affairs during work hours, and eventually to improve productivity and profitability in the context of an new competitive environment.⁶

In 1983, *the labour contract system* for the hiring of labour in state enterprises was gradually introduced to replace lifetime employment in the state sector, and was introduced nationwide in the fall of 1986. This system dictated that all new employees in the state sector were hired on a basis of 3 to 5 year contracts, at the end

⁵ The power of enterprises might be even much greater than in most developed market economies as there were no unions and less relevant legislation to protect workers in the Chinese non-state sector.

⁶ Since the early 1980s, state-owned enterprises have had to face more and more competition not only from rapidly growing non-state enterprises, but also from competitors overseas, particularly from 1984 when a two-track pricing system was established. Since then, SOEs have had to expose themselves more close to market.

of which, either party could terminate the arrangement. It is estimated that, by the end of 1992, 17% of the urban labour force were covered (Knight and Song, 1995). However, the labour contract system only covered new employment, and the rest majority (83%) of the urban labour force was not yet covered. This was called 'XinRen XinBanFa, LaoRen LaoBanFa' in Chinese, which meant that only recruitment for new employment was subject to the labor contract system, but incumbent workers (permanent workers) still retained their privileges such as 'iron rice bowl'. Consequently, some upsetting phenomena emerged as described by a saying 'Linshigonggan, Hetonggongzhang, gudingongzuo' in Chinese. This implies that temporary workers (they usually came from rural areas) worked hard and overtime (as their jobs had the least security). And contracted workers (they usually were from urban areas) stood away from work watching temporary workers to do their jobs as they had a better job security relative to temporary workers. But permanent workers sat aside and carried out their personal affairs, as their jobs were completely secure.

In 1989 the '*optimal labour reorganization scheme*' was adopted to deal with the problem of overstaffing in the state sector. Its intention was to allow state-owned enterprises to identify and reduce surplus workers by means of reorganization, redeployment and retraining of labour. However, as Maurer-Fazio (1995) suggested, the state's deeply embedded concerns with open unemployment slowed the process. According to Knight and Song (1995), by February 1992, only 10% of the SOE labour force, were covered by the scheme. Attrition and retraining became the means of eliminating surplus labour.

It is debatable how to assess the number of surplus workers. The Ministry of Labour of the Chinese State Council accepted three different concepts of surplus labour, for a given technological capacity (Fan *et. al.*, 1998): 1. Employment in excess of the enterprise's profit-maximizing level; 2. Employment in excess of the enterprise's maximum labour productivity; and 3. Employment in excess of the enterprise's maximum production. Depending on the concept employed, the computation of surplus labour results in different estimates. The third criterion, giving the smallest number of surplus workers, had been the most commonly adopted by SOEs (Fan, *et. al.* 1998). This shows that the government tends to arbitrarily minimize the level of

unemployment while attempting to improve productivity. This reflects that the government highlights the importance of balancing the objective of improving productivity of state-owned enterprises against maintaining social stability.

Reforms on Wage System in the State Sector

To reform the old wage system, which is characterized as egalitarian regardless of performance, *the bonus system and piece rates* were introduced into the state sector as early as in 1978 as a prelude to wage reforms. In 1983 as part of state enterprises' reforms, SOEs were allowed to redistribute after-tax profits for various purposes, including employee welfare and bonuses, subject to stipulated percentages of the total payroll.⁷ The first step was to convert the traditionally centrally fixed total wage quota into a floating total wage bill (Meng and Kidd, 1997). The floating system related the enterprise's total wage bill to its profitability. The intention of this measure was in an attempt to link the benefit of workers closely to their serving enterprise.

The second step attempted to forge a direct link between an individual's wage and labour productivity within the enterprise. The incentive mechanisms adopted varied among regions and across industries (Shan, 1991), because they derived from a Contract Responsibility System (CRS), which allowed the managers of SOEs with greater decision-making power on a wide range of matters (Fan *et. al.*, 1998). But of the wide range introduced, the wage-plus-bonus system was the most popular. The share of the basic wage in total payroll of SOE employees fell from 85% in 1978 to 45% in 1992 (Knight and Song, 1995). The total payroll of SOE employees consisted of three major components: 1) a basic wage, determined by working age, working position, and skill level, 2) bonuses and overtime pay; 3) subsidies and allowances (e.g., for cost-of-living increases).

The wage-plus-bonus seemed to be a large change to the previous eight grades wage structure (refer to note 4). Ideally, this should lead to high worker effort levels in the state sector, given that the proportion of non-basic wages including bonuses in the

⁷ Initially, bonuses were restricted to a maximum of 5% of the total payroll. This ceiling, however, has been eliminated gradually.

total payroll increased from 15% in 1978 to 55% in 1992 and bonuses were paid from retained profits (Fan, *et. al.*, 1998). However, in practice this was called in question. Firstly, bonuses were almost equally distributed across enterprise types regardless of enterprise's performance. Some low profit-making or loss-making enterprises still distributed bonuses (Walder, 1987; Hussain and Zhuang, 1994). Secondly, in each enterprise, bonuses were distributed equally among employees (Meng and Kidd, 1997). All of these meant the link between an individual's performance and bonus had not yet well forged. Effort incentives associated with the wage-plus-bonus system were limited.

Xiagang: a New Phase of Chinese Labour Market Reforms in the State Sector

The reforms mentioned above were initiated and carried out in 1980s, which constituted a basic framework of the Chinese labour market in the state sector. In the wake of more than two years of economic contraction, Deng Xiaoping undertook a historic 'southern inspection tour' (*nanxun*) at the beginning of 1992.⁸ Deng used his tour to advocate renewed reform and accelerated economic growth. Since then, the reform in SOEs entered a new phase.

At the end of 1993, a program that emphasized ownership reform of state enterprises was adopted by the third plenary Session of the 14th Congress of the Chinese Communist Party.⁹ The 'Decisions on Issues concerning the Establishment of a Socialist Market Economic Structure' put bolder reform policies on the agenda. These include (The following list is reproduced from Fan, *et. al.*, 1998 p18):

- 1). Transforming SOEs into a modern enterprise system by harmonizing the relationship of the ownership of state assets and the distribution of rights between enterprises and the state;
- 2). Diversification of ownership structure of the enterprise by encouraging more non-state ownership;

⁸ Deng's 'southern inspection tour' (*nanxun*) was undertaken during January-February 1992, accompanying by a number of Chinese senior leaders, which included visits to Shanghai and Guangzhou, as well as Shenzhen and Zhuhai Special Economic Zones. *Nanxun* was recognized to be the last vigorous counter-blow of Deng against Chinese conservative forces.

- 3). Creating a competitive market for state and non-state enterprises;
- 4). Accelerating the social security system reform by separating social welfare functions from state-owned enterprises.

These principles were reaffirmed during the 15th Congress of the Chinese Communist Party in September 1997. It was the first time for a Chinese senior leader to declare that a socialist state does not need to have the state sector as the predominant actor in the economy to maintain its socialist nature. These principles have given the Chinese government the impetus to pursue further reforms on state-owned enterprises, not without the strong opposition of some constituencies in the country.

Since then, *xiagang* in the state sector has appeared instead of previously disguised unemployment. *Xiagang* in Chinese means 'left-post'. It may separate into two types: one is under the situation where the whole enterprise stops production or produces little due to huge debts over assets (bankruptcy), then all workers in the enterprise are forced to go home waiting for new job allocations. In this case, workers are usually paid basic wages by their nominal enterprise or/and local government (For example, in Hunan province such workers were paid at least 200yuan/person per month in 1996 according to the government's regulation). Another one is under the situation where the enterprise is still in operation with somewhat profits. In pursuit of higher profits, the enterprise cuts off overstaffing workers.

From the perspective of efficiency wage theories, the threat of employment termination provides a necessary mechanism to discourage individual from shirking, therefore to improve worker's productivity. For example, Groves *et al.* (1994) argue that as well as immediate monetary rewards, workers can be given effort incentives by facing the prospect of losing their job. Moreover, according to the circumstances in the Chinese labour market, Meng and Kidd emphasized that to ensure that individuals utilize their full human capital stock, it is essential to apply a mechanism of punishment on shirking workers into the Chinese state sector (Meng and Kidd, 1997 p.407).

⁹ China is absolutely dominated by the Chinese Communist Party. Hence, any important reform policies put forward by the government have to be first subject to consent of the Chinese Communist Party.

Since the opening of the third plenary Session of the 14th Congress of the Chinese Communist Party, '*Xiagang*' is the only major reform measure having been actually implemented by the government. Other reforms like the social security reform progress slowly (Fan *et. al.*, 1998). From these perspectives, '*xiagang*' can be regarded as such a mechanism to discourage shirking and ensure that workers perform satisfactorily.

However, in Section 2.2 it reviewed that in China, worker's social welfare is provided by their employed enterprises rather than by a national social safety net or organization, thus it is conditional on being allocated to an enterprise. Once a worker is shifted away from his or her enterprise, he or she will lose his or her social welfare. It is important to note that in this context, if a lot of workers are laid off from the state sector without social welfare support, social unrest may be triggered. Maintaining social stability is a basic policy of the Chinese government. This is due to a belief that social unrest could derail the whole economic reform process. Thus, it is plausible to assume that the government wants to avoid improving productivity in SOEs at an expense of triggering social unrest. Based on this point, when *xiagang* was introduced into the state sector as a mechanism to ensure workers perform satisfactorily, it should entailed some features that could reflect the government's concern with social stability. In other words, *xiagang* should be a policy that can reflect the important trade-off between maintaining social stability and improving productivity.

Now let us have a close look at whether this important trade-off is inherent in the policy of *xiagang*. *Xiagang* in Chinese means 'left-post', which is a system where redundant workers in SOEs retain their position with the enterprise as well as *part* of their wage without having to work. Workers who do not meet effort requirements may be shifted into *xiagang*. The main features of *xiagang* are:

- 1) *Xiagang* workers in SOEs still receive subsistence allowances from their enterprise and this is endorsed by the government, which is different from laid-off workers in NSOEs who do not receive any income from their enterprise or the government;

- 2) The scale of *xiagang* workers in SOEs is limited by the government. This means SOEs can not lay off workers within their own discretion. In contrast to this, NSOEs may lay off workers entirely within their own discretion.
- 3) *Xiagang* workers in SOEs generally have better positions to be rehired by their enterprise. On the one hand, the government requires job opportunities in SOEs be first offered to *xiagang* workers; On the other hand, the hiring cost for an additional worker from *xiagang* workers is relatively low, given both *xiagang* workers and the unemployed in the non-state sector have identical skills. Assume a firm is going to pay this new worker wage W , then by hiring a *xiagang* worker, the cost to the firm is only the difference of wage W minus the subsistence wage of a *xiagang* worker, but by hiring someone from the unemployed, it will be W .
- 4) Most social welfare like provisions of free accommodation and medical care is still retained for *Xiagang* workers in SOEs and the government endorses this. In contrast to this, the unemployed in NSOEs do not get this social welfare from their enterprise or the state.

These features of *xiagang* show that on the one hand, *xiagang* has forged a link between individual effort and penalty in SOEs to some extent, which may promote the productivity improvement in SOEs. On the other hand, *xiagang* workers' basic life is secured, and the scale of *xiagang* is limited, which may substantially reduce the risk of social unrest. It therefore looks that the trade-off is inherent in the policy of *xiagang*.

It is important to note limitation to the scale of *xiagang* workers.¹⁰ Evidence on it includes that a lot of loss-making enterprises are retained by the government through provisions of either explicit or implicit financial subsidiaries (Fan, 1998). In addition, Section 2.3.2 shows that SOEs tend to consider the number of overstaffing in terms of 'employment in excess of the enterprise's maximum production'. This computed method predicts the smallest number of surplus workers. The purpose of using this method is likely to aim to minimize the scale of actual *xiagang* workers.

¹⁰In Chapter 4, I will introduce this concept, i.e., limitation to the scale of *xiagang* workers, into my model. This suggests an introduction of social stability parameter. See Section 4.2 in Chapter 4 in detail.

Limitation to the scale of *xiagang* workers does not mean that *xiagang* is absolutely prohibited. It merely means that the number of actual *xiagang* workers will be less than it should be. In fact, we may have observed that in the past a couple of years, an increasing number of state-owned enterprises' workers were supposed to leave their posts and become *xiagang workers*. While precise data are not available on the numbers of such workers, the data for 1996 indicate that over 6 percent of formal urban employees were '*xiagang*' (i.e., some 8.9 million persons), of whom two-thirds were in SOEs and the rest in urban collectives (Fan *et. al.*, 1998).¹¹ The growing numbers of *xiagang* workers in the recent years are more likely to be due to type one SOEs' profitability is rapidly and continued deteriorating (see Section 2.3.2) rather than due to limitation to the scale of *xiagang* workers has been eased in the state sector.

Summary

As Chinese economic reforms developed, the Chinese Labour System in the state sector has also been experimentally and gradually reformed. The reform in the labour field aimed to increase the role of market forces both in terms of labour allocation and wage determination, and to strengthen a direct link between individual effort and reward/penalty. Without these reforms, the state-owned enterprises would probably have already been devastated by the emerging competitors, which may cause a lot of workers in SOEs to lose their jobs. Given the unique feature of the Chinese social welfare system as discussed in Section 2.2, such massive unemployment may trigger social unrest and economic turmoil.

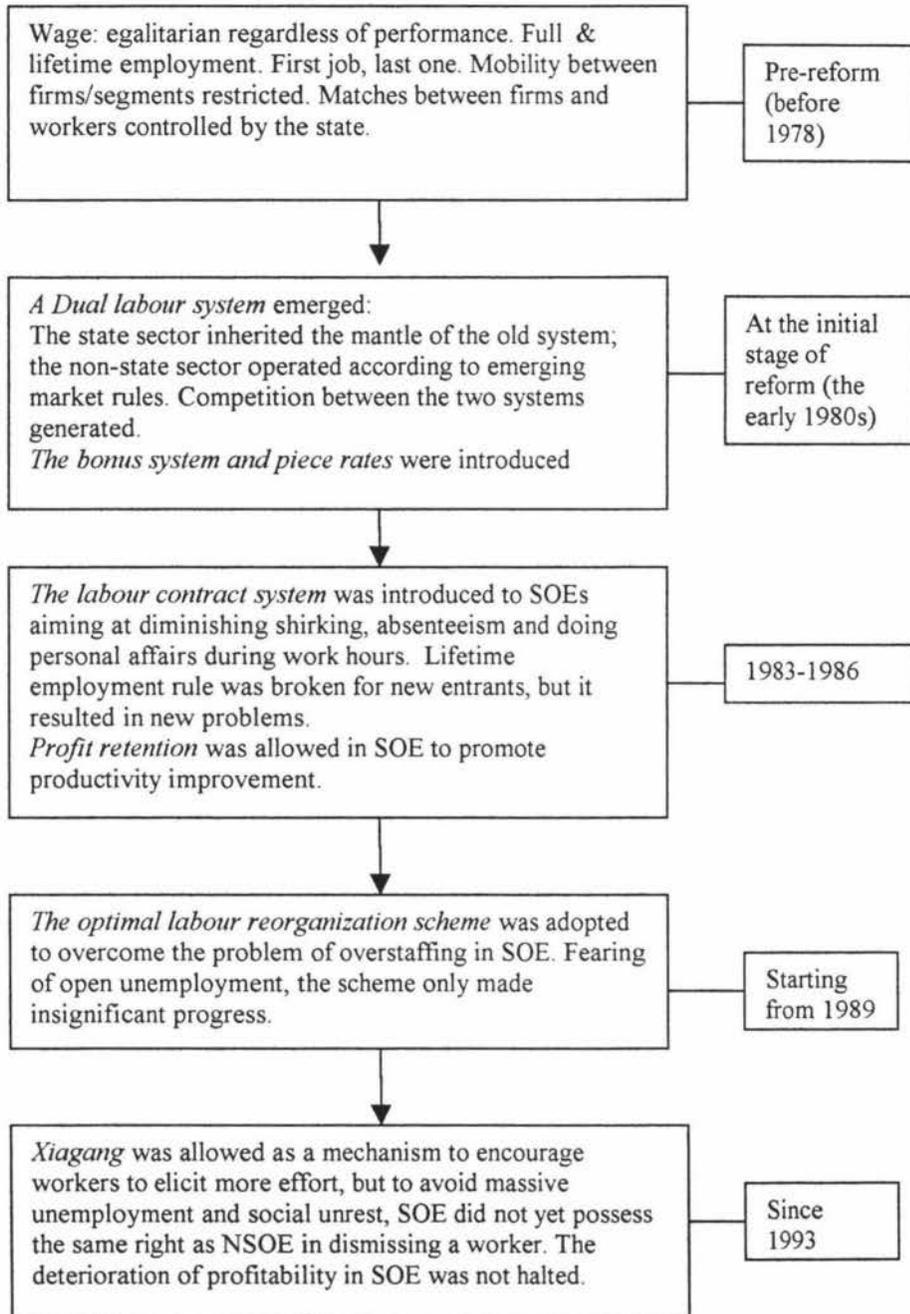
The labour contract system focused on increasing enterprise autonomy over hiring and firing. *The optimal reorganization scheme* was designed to reduce enterprise's overstaffing. *Wage reform* attempted to promote worker's productivity by allowing enterprises to retain some percentages of profits, which, in turn, funded various worker incentive and bonus schemes.

¹¹ For more details, it is recommended to refer to Dai and Li, 1991, Jefferson *et al.*, 1992, Jefferson and Rawski, 1994, Hussain, 1994, Groves *et al.*, 1994, Knight and Song, 1995, Maurer-Fazio, 1995, Meng and Kidd, 1997, and Fan *et.al.*, 1998.

In the 1990s, '*Xiagang*' was introduced into the state sector, which reflected the importance of balancing the objective of improving productivity against that of maintaining social stability. It aimed to strengthen the link between individual's effort and penalty, and thus to induce workers to put in effort for high productivity. Meanwhile, it was also designed to avoid massive unemployment and social unrest that could derail the whole reform process.

The following chart explicitly exhibits the main stages and measures that have been implemented in the Chinese labour market within the past two decades:

Fig. 2.1 A Chart of the Chinese labour market reform proceeding



2.4: An Examination of the Progress and Prospects of Chinese Labour Market Reforms

2.4.1 Introduction

Productivity is determined by a lot of complicated factors, such as the level of technology, intensity of capital, effort levels of workers, and the quality of management. Section 2.2 and 2.3 showed that during the pre-reform period, low effort levels of workers in SOEs were an important element that contributed to low productivity in the state sector. Immobility of labour, the 'iron rice bowl' system, and an extremely egalitarian wage structure in the pre-reform state sector suggested a direct and effective link between individual effort and reward/penalty almost disappeared in such a labour system, where reward and penalty did not relate to worker's performance. Shirking, absenteeism and carrying out personal affairs during work hours were common occurrences.

Section 2.3 showed that the Chinese government had implemented a series of reform measures aiming at promoting workers to put in effort. In this section, I focus on reviewing the progress achieved through these reform measures, and identifying the weaknesses of these reform measures. Finally, I also have a look at prospects of the Chinese labour market reform in future.

This review puts forward to some important issues. For example, by having implemented these reform measures, why evidence on productivity improvement in SOEs is mixed. Some literature suggests the improvement of productivity is evident (Groves, *et.al.*, 1994), but others argue that the improvement of productivity is slow (Meng and Kidd, 1997, Yin, 1998). To answer these issues is the central task of this thesis.

2.4.2 Reviewing the Progress of the Chinese Labour Market Reform

An extensive literature has examined whether Chinese labour market reforms during the past two decades have achieved progress.¹² However, their conclusions are mixed. This section reviews these major arguments, and then has a look at prospects of Chinese labour market reforms in future.

Knight and Song (1995) argued that the progress of '*the labour contract system*' was slow, which reflected accommodating behavior on the part of the authorities and enterprise managers: managers identified closely with labour, they needed the support of workers, and thus responded to social pressures. In some enterprises, contracted workers were transformed into permanent ones (Dai and Li, 1991).

Another reason why this system had slow progress seemed to be due to the technical unfeasibility of this measure. First, a short contract term (3-5 years) impeded employees and employers from making adequate capital-investments. For instance, SOEs worried about a capable employee probably terminating the arrangement and seeking a better wage in NSOEs when the contract expired and skills were acquired (Fan *et al.*, 1998). Second, in practice it was difficult for a state-owned enterprise to lay off or terminate arrangements with shirking workers (Dai and Li, 1991). Termination of contract or lay-off means a worker will since then lose his or her income and social welfare, given the unique feature of the Chinese social welfare system as reviewed in Section 2.2. Thirdly, the resistance also came from contracted workers' parents, as in many circumstances contract workers were working within the same enterprise of their parents and their parents were usually permanent workers, who were free from the labour contract system.¹³

¹² It is recommended to refer to Dai and Li, 1991, Jefferson *et al.*, 1992, Jefferson and Rawski, 1994, Hussain, 1994, Groves *et al.*, 1994, Knight and Song, 1995, Maurer-Fazio, 1995, Meng and Kidd, 1997, and Fan, *et al.*, 1998.

¹³ In practice, permanent workers' children (at least one child of every pair of parents) have priorities to be first employed by their enterprise. Equally, their children are hard to be employed by other enterprises. According to the Chinese culture, trying to help child find job is regarded as the duty of parents.

Korzec (1992) suggested that lack of labour mobility under this contract system also contributed to slow progress of this system. This literature put forward to two major factors that severely limited mobility of labour under this contract system: 1. The continued existence of a grand plan, e.g.: departments of labour administration in the governments still predetermined who and where to be recruited; 2. Severe restrictions on geographical mobility like the *hukou* system still existed. They tended to cause a distorted phenomenon, i.e., workers who firms wanted to hire could not be hired, but workers who firms did not want were allocated to them.

Weakness of implementing this contract system was that rights and obligations were unfairly allocated among temporary, contracted and permanent workers. Permanent workers were free from this contract system. This meant that they continued to hold their 'iron rice bowl' and did not have risks of being laid off regardless of performance. This kind of privilege tended to induce them to put in less effort. Thus, their productivity may be low. Permanent workers enjoyed high rights, but fulfilled low obligations. In contrast to them, contracted or temporary workers had to face risks of being laid off in terms of this contract system. This tended to induce them to put in effort, and thus their productivity tended to be high. They fulfilled relatively high obligations, but enjoyed relatively low rights. This phenomenon is just as described in Section 2.3.2: "Linshigonggan, Hetonggongzhang, gudingongzuo" (Dai and Li, 1991).

Based on this, Dai and Li (1991) argued, albeit gradually implementing this measure was necessary, a more complete reform should be promoted. The privileges of permanent workers like the iron rice bowl should be abandoned. All workers, regardless of permanent or new contracted workers, should be treated equally. Otherwise, the effectiveness of this reform measure would be little.

With regard to the '*optimal labour reorganization scheme*', Fan *et al.* (1998) suggested that the results of empirical tests on its performance were ambiguous. Although common sense was that this restructuring of SOEs most likely had a positive impact on total factor productivity (TFP) growth, there was so far no consensus on the size of TFP's improvements.

Fan *et al.* (1998) examined it from different perspectives. For example, Jefferson *et al.* (1992) suggested a positive TFP growth of 2.4 percent per annum in SOEs between 1980 and 1988. However, Woo *et al.* (1994) showed that estimates of TFP growth were extremely sensitive to the use of appropriate input and output deflators. They argued that Jefferson *et al.* overestimated SOEs' TFP growth due to the capital stock and material input deflators that were substantially higher than deflator for industrial output. Hence, Jefferson *et al.* estimation for TFP growth was not very valuable. The investigation of Hay *et al.* (1994), who used the data of 700 SOEs between 1980 and 1988, supported the view of Woo *et al.* (1994).

With regard to *the wage-plus-bonus scheme*, Meng (1997) argued that it was unclear how successful this scheme was likely to be. The bonus often became an extra component of the wage and was distributed equally among all employees. Although it was assumed that the worker received a bonus only if he or she met some performance standard, there was nothing that prevented the manager from setting the performance standard so low that everyone qualified. This was particularly the case in the state sector, where there were informal cultures and customs of egalitarianism. If bonuses were paid out equally regardless of individual performance, effectiveness of implementing the wage-plus-bonus system would be questionable because it failed to forge a direct and effective link between individual effort and reward.

Groves, *et al.* (1994) analyzed the weakness of implementing this scheme. It pointed out that, with total incentive payment limits and growing only as rapidly as the basic wage, workers would correctly treat the bonus distributed as a zero-sum game and resist differential. They argued that it was personally costly for a manager to institute an incentive-payment scheme, in that it created contention between workers and management, as well as among different groups of workers. Rewarding performance usually meant increasing disparities among different workers' wages. Disputes arose over how to assess performance, how much to reward seniority, whether it was to create income inequality and so on, which often resulted in low morale and dissatisfaction among those not chosen to receive raises. Shirking or lazy workers might even collude against management, subverting attempts to reward good performances by imposing social sanctions on employees who worked too hard.

Therefore, the managers of SOEs were more likely to distribute bonus equally so as to reduce relevant side effects of rewarding performance.

Moreover, Fan, *et al.* (1998) and Groves *et al.* (1994) criticized that bonuses contributed to a great deal of payroll expansion in the state sector at a speed that was not commensurate with increases of labour productivity. Fan and Woo (1993) also argued that the rapid expansion of bonus bill had been at the expense of investments in the upgrading of technology, thus impairing productivity performance.

A survey supported them and showed that much of the benefits of this reform seemed to have gone to workers and the government subsidy burdens had been little reduced (Groves *et al.*, 1994). Table 4 on the next page displayed that a substantial decrease of the share of basic wage among the total payroll in the state sector from 85.7% in 1978 to 55.4% in 1996.

Nevertheless, another survey demonstrated that the wage-plus-bonus scheme promoted productivity improvement in sampled enterprises (Groves *et al.*, 1994). Based on a sample of 514 state-owned enterprises located in 20 of China's 30 provinces, the survey of Hussain and Zhuang (1994) suggested that bonuses were much higher in profit-making enterprises than in loss-making enterprises.

Xiagan is the last but the most important reform measure that we reviewed in Section 2.3. However, there is not yet much literature that has examined its performance.

Finally, how to empirically assess the overall performance of having implemented these reform measures since 1978? Unfortunately, there was not yet much literature undertaking this task. One exception was Meng and Kidd's (1997). They used the survey data conducted in 1989 by the Institute of Quantitative Economics of the Chinese Academy of Social Science and identified the success of the reform package by examining the pre- and post-reform wage structure.¹⁴ Their analysis was based on

¹⁴According to Meng and Kidd, 1997, the data was collected originally for a joint research project that examined productivity and international competitiveness in China, Japan, and the USA. The data set is a firm-based state sector employee panel survey for the period 1981 to 1987. Approximately 120,000

Table 4. Components of Total Wage Bill in State Sector (Shares %)

Year	Basic Wage	Bonus and Extra-wage	Subsidies + allowances	Residuals
1978	85.7	2.4	6.5	5.4
1979	77.6	7.9	8.8	5.7
1980	72.4	9.7	14.1	3.8
1981	71.6	11.3	14.0	3.1
1982	70.4	12.5	14.1	3.0
1983	70.2	16.5	14.1	2.8
1984	65.9	16.5	14.5	3.1
1985	64.6	14.5	18.5	2.4
1986	63.1	14.7	18.8	3.4
1987	61.3	16.9	18.9	2.9
1988	56.1	19.5	21.4	3.0
1989	54.2	19.9	23.1	2.7
1990	55.7	19.1	21.8	3.4
1991	55.4	20.0	22.1	2.5
1992	51.7	22.2	23.8	2.4
1993	46.6	23.3	25.1	5.1
1994	(-) 17.9	(-)	(-)	
1995	(-) 16.8	(-)	(-)	
1996	55.4	16.1	23.9	4.6
1996				
Ucs ¹	66.2	12.5	15.7	5.6
OUs ²	59.8	19.9	12.1	8.2

Source: *China Yearbook of Labour Statistics*, various years

Notes: (-) not available

1 urban collective units

2 other units include share-holding companies, joint-ventures, foreign-owned enterprises and overseas Chinese companies.

human capital theories. The theories suggested that, in a market economy, wage should reflect worker's human capital and skill. The Pre-reform wage structure in

survey questionnaires were distributed to various firms among 30 industries. The overall response rate was 40 percent. For more detail, refer to Meng and Kidd, 1997.

China was fundamentally different from those in market economies and the extent to which the market-oriented reforms should have diminished the differences in wage structure between China and the developed economies if reforms were successful.

Their empirical investigation suggested that there was evidence of a structural change in the system of wage determination, but the rate of return to human capital increased slightly. Furthermore, the continuously upward sloping experience earnings profile remained intact. The rates of return to skills had only increased slightly over the period.

Therefore, Meng and Kidd (1997) concluded that if one of the central aims of the labour market reform was to increase workers' effort levels, the evidence of success was not overwhelming. In other words, the labour market reforms in China had failed to deliver their intended effects. However, a limitation of this survey is that it was undertaken between 1981 and 1987, when some reform measures did not yet implement. When we try to use it to empirically assess the overall performance of reforms, this limitation can not be overlooked.

2.4.3 Prospects of the Chinese Labour Market Reform

Reforms in China are an unprecedented complicated task, but the Chinese gradual and piecemeal reform has made a great success and achieved an unparalleled economic growth. An extensive literature tends to suggest that the Chinese labour market reforms, general speaking, have made some progress (Maurer-Fazio, 1995 and Li, 1997). At least, in the non-state sector the successes of reforms are salient, although there is literature questioning the progress of reforms in the state sector (Harrold, 1992). Some literature, such as Harrold, 1992, suggests that reform's prospects in the Chinese labour market will mainly rely on whether and how to intensify reforms in the state sector. Furthermore, success of reforms in the state sector is mostly subject to how other intensive reform measures are undertaken in some relevant fields, for example reforms on insurance system and ownership structures of enterprises.¹⁵

¹⁵ For more details, please refer to Maurer-Fazio, 1995, which lists an extensive literature holding this view.

It is important to note that the improvement of productivity in the state sector is not evident and the numbers of loss-making enterprises in the state sector continue to rise (Fan, 1998). If this situation can not be halted, it may cause a lot of SOEs to go bust and a lot of workers to lose their jobs, and eventually it may trigger social unrest in China. This suggests that the priority of future reform should be how to halt this tendency.

SOEs now have two difficulties. One is that productivity in the state sector has not yet improved significantly, but production costs like the total payroll have greatly increased. In other words, the improvement of productivity is not commensurate with the increase of production costs, particularly of the total payroll. Consequently, profitability continues to decline. Another one is that developments of the non-state sector are very robust, which growth has greatly undermined the dominant position of SOEs in China's urban industries and even threatened the survival of SOEs.

Table 5 and Table 6 on the next two pages indicate the change pattern of the average annual wage and the average industrial output per worker in different types of enterprises respectively. From both Table 5 and Table 6, we can see that the per capital annual industrial output in SOE was only increased from RMB15, 080 in 1985 to RMB23, 483 in 1994, but the average real wage index increased from 87.9 in 1985 to 130.4 in 1996. However, during the same period, the per capital annual industrial output in collective enterprises and private firms rose considerably from RMB8, 206 and 22,752 to RMB26, 485 and 57,310 respectively. The average real wage index changed only from 95.2 for collective enterprises and 79.6 for private enterprises to 121.5 and 131.3 respectively.

If comparing the growth rate of productivity and wages between two sectors, we may conclude that the speed of average wage increase in SOEs considerably outstrips that of productivity increase in comparison with the corresponding changes in NSOEs. This view coincides with that of Gordon and Li's (1999). They claim that, given the level of capital and technology were controlled for, 'we suspect that not only would

the state sector look relatively less productive on average, but also productivity in the state sector would grow relatively less quickly over time'.¹⁶

Table 5. *Per Capital Industrial Output in Different Enterprise Groups (RMB/person a year)*

Year	The State Sector	The Non-State Sector	
		Collective	Private
1985	15,080	8,206	22,752
1986	15,451	8,600	22,009
1987	16,671	9,979	26,203
1988	18,056	12,195	32,893
1989	18,320	13,170	36,550
1990	18,639	14,258	41,465
1991	16,913	10,862	38,805
1992	20,708	15,502	47,642
1993	21,845	20,597	53,454
1994	23,483	26,485	57,310

Source: State Statistical Bureau: China Industrial Economic Statistical Yearbook 1995 (p. 56) and China Statistical Yearbook 1995 (p. 249).

Note: (1) The constant price of 1980 is the basis. The factory price index was used to deflate the 1991-1994 number, which was originally reported in 1990's constant price. (2) The collectives are mixtures of state and non-state enterprises.

¹⁶ Gordon and Li (1999) said during this period, capital expenditures in the state sector grew at 15% per year and a sizeable fraction of this new capital was imported from abroad. In addition, in Chapter 2, I reviewed that the pre-reform Chinese industrialization policy had tended to over-emphasize the development of capital-intensive firms in the state sector. Therefore, it would be groundless to argue that a relatively lower productivity in the state sector is due to their low capital intensity. This suggests there are some other more important aspects that may cause a relatively lower productivity in SOEs. This thesis aims to examine it from the perspective of efficiency wage theories. More details refer to Chapter 3 and 4.

Table 6. *Average Wage of Staff and Workers by Different Ownership (yuan in current price)*

Year	All Urban Workers	SOEs ¹	UCs ²	Other ³	SOEs	UCs	Other
	average annual wage				average real wage index (1990=100)		
1978	615	644	506		62.6	66.8	
1979	668	705	542		67.3	70.3	
1980	762	803	623		71.3	75.1	
1981	772	812	642		70.3	75.6	
1982	798	836	671		71.0	77.5	
1983	826	865	698		72.0	79.0	
1984	974	1034	811	1 048	83.8	89.4	65.0
1985	1148	1 213	967	1 436	87.9	95.2	79.6
1986	1 329	1 414	1 092	1 629	95.7	100.5	84.3
1987	1 459	1 546	1 207	1 879	96.2	102.1	89.4
1988	1 747	1 853	1 426	2 382	95.5	99.9	94.0
1989	1 935	2 055	1 557	2 707	91.1	93.9	91.8
1990	2 140	2 284	1 681	2 987	100.0	100.0	100.0
1991	2 340	2 477	1 866	3 468	103.0	105.5	110.5
1992	2 711	2 878	2 109	3 966	110.3	109.8	116.3
1993	3 371	3 532	2 592	4 966	116.5	116.2	125.4
1994	4 538	4 797	3 245	6 303	126.6	116.5	127.4
1995	5 500	5 625	3 931	7 463	127.1	120.9	129.1
1996	6 210	6 280	4 302	8 261	130.4	121.5	131.3

Source: *China Yearbook of Labour Statistics*, various years.

Notes: 1. SOEs: State-owned Enterprises

2. UCs: Collective Enterprises.

3. Other: includes share-holding companies, joint ventures, foreign-owned enterprises and overseas Chinese companies.

Meanwhile, according to official data, the percentage of loss-making SOEs has substantially increased to 51% by the end of June, 1996 (Fan, 1998). This suggests that during the post-reform period, profitability of SOEs has considerably deteriorated rather than improved. The evidence shown in Table 5 and 6: i.e., productivity improvement lags behind wage's increase may account for this phenomenon.

This gives rise to an interesting question why SOEs, with a relatively large increase of average wages, failed to achieve an increase of productivity as much as NSOEs, given the level of capital and technology were controlled for. However, from the perspective of efficiency wage theories, high wages tend to elicit workers to put in high effort, thus high productivity.

Some literature suggests that it may be due to the trade-off between maintaining social stability and improving productivity (Fan, *et. al.*, 1998). We know that this trade-off is inherent in the policy of *xiangang*. Then, whether we may therefore suggest that *xiangang* contributes to slow productivity improvements in SOEs?

My thesis aims to theoretically examine this issue from the perspective of no-shirking efficiency wage theories. I develop a theoretic model to extend the Shapiro and Stiglitz no-shirking efficiency wage model (1984) into the contexts of the Chinese labour market that features *xiagang*.¹⁷ I undertake a comparative static analysis on this model. My analysis will not only examine the claim of Fan, *et. al.*, 1998 with regard to a trade-off between social stability and productivity, and will also extend to examine relationships between social stability and a range of other variables such as wages, effort levels, employment, output and profitability.

2.5 Conclusions

This chapter shows that it is very tricky to change a highly centrally regulated and rigid labour system to a market-oriented labour system in a short run. A gradual and piecemeal reform in the Chinese labour market is likely to be the best option. Chinese gradual and piecemeal reforms generate a dual labour sector: the state sector vs. the non-state sector.

One important feature of reforms in the state sector is that balancing the objective of maintaining social stability against that of improving productivity is highlighted. This trade-off is inherent in the policy of *xiagang* that is one of the most important and the boldest reform policies that have been implemented in the Chinese labour market since reforms began in 1978.

Empirical evidence on the progress of Chinese labour market reforms is mixed. This suggests that it is necessary to undertake theoretical analysis to help us comprehend them.

The next Chapter will review the S-S model and other literature that applied efficiency wage theories into the Chinese contexts. Chapter 4 will develop a theoretical model to undertake a static comparative analysis on the relationships

¹⁷For a review of no-shirking efficiency wage theories, please refer to Chapter 3.

between social stability and a range of variables such as wages, effort levels, unemployment, output, productivity and profitability.

Chapter 3: The Shapiro and Stiglitz No-shirking Efficiency Wage Model: The Case of the Chinese Labour Market in the Transition

3.1 Introduction

The last chapter showed that evidence on the progress of reforms in the state sector was mixed. This suggested that to enhance our comprehension in reforms in the Chinese labour market, more theoretical studies are required.

This chapter aims to enhance our comprehension in the relevance of S-S model to the contexts of the Chinese labour market, and then help us extend the S-S model to the contexts of the Chinese labour market more relevantly.

Section 3.2 reviews the S-S model in general; A general critique of the S-S model is reviewed in Section 3.3. Section 3.4 has a look at some important extensions to the S-S model. The relevance of the S-S model to the Chinese labour market is discussed in Section 3.5. Section 3.6 reviews Li's model (1997) and Lu and Cheng's model (1998). Conclusions are offered in Section 3.7.

3.2 Reviews of the Shapiro and Stiglitz No-shirking Efficiency Wage Model

Efficiency wage models consist of at least five separate versions (Riveros and Bouton, 1994), in which wages are used for something other than the allocation of labour. The five separate versions include nutritional theories,¹⁸ shirking theories,¹⁹

¹⁸Nutritional theories basically emphasize the connection between wages, nutrition and productivity. This model was primarily aimed at explaining the link between wages and health, and then between health and productivity for agricultural workers in developing countries. The major implication of this model is that workers should receive a minimum subsistence wage to meet their basic nutritional needs and then to maintain their productivity. In Chinese industrial sectors, the wage of on-job workers should far exceed the subsistence level. Therefore, this model is not congruent with the Chinese situation. References to nutritional models include Liebenstein (1957) and Stiglitz(1976).

turnover theories,²⁰ sociological theories²¹ and adverse selection theories.²² The basic idea is that raising a worker's wage will directly increase his or her productivity, but they differ from each other mainly in their justification for the wage/productivity relationship.

In this thesis, only the Shapiro and Stiglitz no-efficiency wage model (the S-S model) is used because it is the most fully developed efficiency wage approach in the literature. The basic premise of this model is that workers can choose to work or shirk. If they shirk, there is some chance that they will be caught and immediately fired. If there is no unemployment in an economy (above and beyond structural or natural unemployment) and all workers receive the going market wage, there will not be a cost to shirking. The reason is intuitive: if a worker gets fired, he or she can immediately find a job somewhere else without loss. To increase the cost of shirking, firms pay a higher than the going market wage, with resulting unemployment acting as a disciplinary device on workers.

¹⁹ Shirking theories are developed by some best known papers like Shapiro and Stiglitz (1984), Calvo (1979), Malcolmson (1981) and Foster and Wan (1984) etc. This section of my thesis aims at reviewing Shapiro and Stiglitz no-shirking efficiency wage model. More details will be discussed in the following.

²⁰The best known papers about turnover theories are Stiglitz (1974) and Salop (1979). This model presumes that a firm faces a trade-off for wages. On the one hand, it tends to reduce wages, but on other hands, a low wage will result in more turnover costs as more workers quit and have to be replaced and trained. In order to reduce turnover costs, firms tend to increase wages with resulting unemployment. In structure, it is similar to shirking theories. This time, however, the benefits to the firm result from the effects of reduced turnover costs rather than shirking. We should realize the Chinese labour market is very different from the markets in developed countries. In China, it should not be underestimated for the mobility costs associated with institutional obstacles as discussed in Chapter 2, which include *hukou* system and prevailing welfare system provided by enterprises etc. Although some reforms on these aspects have been undertaken in China since 1978, it is believed that these institutional obstacles still constitute a major contribution to much less labor mobility in Chinese labor market in relation with in developed economies (Dai and Li, 1991, Yin, 1998). Therefore, it is not appropriate to apply this model into present Chinese labour market.

²¹Sociological theories may be found in detail in Akerlof (1982, 1984). This model suggests workers used to compare their wage with what is regarded as a 'fair wage'. If paid higher than 'fair wage', they will put in more efforts to reciprocate their good treatments, thus productivity rises. In turn, a high unemployment rate is likely to reduce the 'fair wage' level. However, as claimed by Carmichael (1990), this model has not, in fact, progressed very much further since it was advocated by Akerlof.

²²Adverse selection theories argue that firms tend to raise wages to attract a larger and better pool of suitable and high-quality applicants, given that the quality of applicants, except known by the applicant themselves, is hard to assess by the firms and assessment is very expensive (Weiss, 1980). However, in SOEs worker's wage is mainly regulated according to his or her education level and working history. The autonomy of state-owned firms on worker's income is over other forms of income rather than salary. It is hard to link other forms of income with the affects of the adverse selection model's arguments.

Shapiro and Stiglitz highlight a positive relationship between wage and productivity. The S-S model suggests that increases in wages will raise costs of job loss, reduce shirking and thus will raise productivity. By contrast with conventional neo-classical models which view firms as price-takers in perfect markets, in the S-S model firms will no longer regard the wage rate as an exogenous parameter, but rather as an endogenous one. They will choose an optimal wage in pursuit of maximizing profits.

One important assumption of the S-S model is that costly or imperfect monitoring and the moral hazard problem exist in an economy. Costly or imperfect monitoring means that employers are unable to costlessly and perfectly observe worker's on-the-job effort. The firms with higher monitoring costs tend to pay workers higher wages. The moral hazard problem means that between firms and workers, one side takes advantage of another side, given existence of costly or imperfect monitoring. For instance, in a market with imperfect monitoring, workers have incentives to cheat their firm and to shirk.

In terms of these assumptions of the S-S model, one question is naturally raised: whether other firms will react by raising their workers' wages in response to one firm setting a wage rate above the market clearing level, and then will the incentive effect of raising wages disappear? The Shapiro and Stiglitz model denied this possibility. The reason is that as all firms raise their wages, their demand for labour decreases, and unemployment results. With unemployment, a worker has an incentive not to shirk even if an identical wage is offered in other firms, because an unemployed worker needs to wait some time to be re-hired, depending upon the size of unemployment pool. Therefore, in the light of the S-S model, involuntary unemployment appears to be a plausible scenario in many modern labor markets with costly or imperfect monitoring, in either developing or developed economies. This prediction of the S-S model seems to be highly consistent with reality.

Based on the assumptions described above, Shapiro and Stiglitz formulate a simple model that explores the role of unemployment as an incentive device. It postulates that, by receiving a given wage, an employee will select an effort level to maximize his or her expected lifetime utility stream, which involves comparison of the utility from shirking with utility from not shirking. If and only if his or her utility from not

shirking is not less than the utility from shirking, he or she is then induced to put forth effort. Otherwise, he or she will prefer to shirk. This condition is defined as the *no-shirking condition* (NSC).

The optimal policy for a firm would be to pay a wage in excess of the opportunity cost of a worker (that which the worker would expect to get from somewhere else). On the one hand, a higher wage will directly increase the worker's utility of no shirking; on the other hand, it will also indirectly decrease the worker's utility of shirking because higher wages will result in higher unemployment. In the aggregate, average wages and labour productivity will rise and employment will fall. Equilibrium is attained when the period of unemployment has reached the point where the cost to a worker of being dismissed is high enough to deter his or her shirking.

This mechanism can be depicted by fig. 3.1:

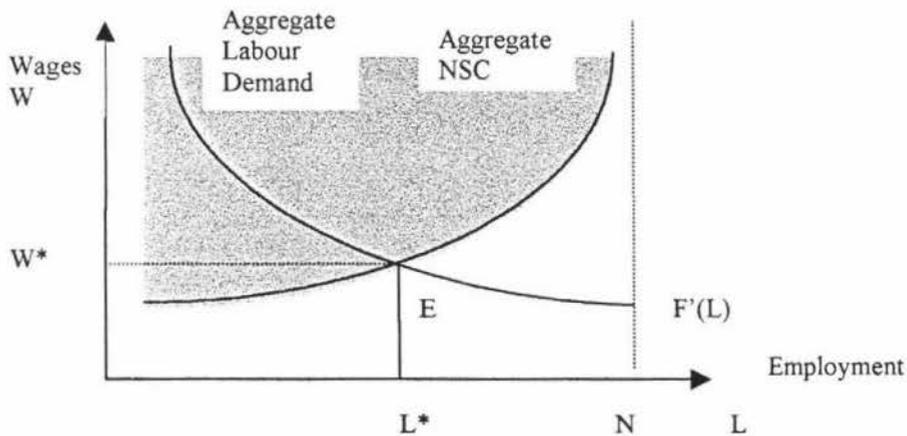


Fig 3.1 Equilibrium Unemployment

Fig 3.1 consists of two curves: one is the no shirking condition (NSC) curve, with the shaded area being the no shirking region. In this region, a worker's utility of no shirking is greater than the utility of shirking. The other one is the demand curve, which indicates the firms' demand for effective labour. The two curves intersect at point E , which is the equilibrium point that determines the wage and unemployment level.

On the one hand, at the equilibrium point, firms have no incentive to further raise their wages because this wage level is sufficient to elicit effort from employed workers. Meanwhile, workers also value their jobs at this wage level for two reasons: (1) the high wage themselves, and (2) the correspondingly low level of employment (due to low demand for labour at this wage level). The latter implies that workers will face a long spell of unemployment in the event of being dismissed.

On the other hand, at the equilibrium point, firms also have no incentive to reduce their costs by lowering wages. It is due to the fact that a lower wage can not ensure that incumbent workers will elicit appropriate effort levels. Even in labour markets where there are unemployed workers with similar skills who compete for lower wages, the firms will not hire lower waged workers. This implies that unemployment is involuntary. Moreover, it also implies that conventional market forces can not eliminate unemployment because firms have no incentive to lower wages to market clearing levels. Therefore, unemployment can persist over time.

The S-S model has several important implications. Shapiro and Stiglitz conclude them from five aspects (Shapiro and Stiglitz, 1984). Firstly, it predicts that unemployment benefits and other welfare benefits increase the equilibrium unemployment rate, but for a reason different from the conventional one put forth, which claims that benefits will make one lazy and more dependent upon others, thus reducing one's incentive to look for a job. In the S-S model, benefits are viewed to reduce the 'penalty' associated with being fired, and hence reduce the cost of shirking. Therefore, to offset the negative influence of benefits upon on-the-job workers incentive, firms have to rise on-the-job worker's wages further, with a lower demand for labour and a higher equilibrium unemployment rate.

Secondly, the S-S model explains why wage adjustment is sluggish even in the face of aggregate shocks. The reason is that in the transition, firms would not decrease wages drastically for the sake of ensuring the no-shirking condition is met. They, hence, tend to decrease wages at a slow pace to match the growth in the unemployment pool.

Thirdly, the S-S model suggests that the market equilibrium is not generally *Pareto* optimal, where the costs associated with monitoring have been explicitly taken into account. Therefore, some kind of interventions in the market will probably increase the total welfare. In particular, it predicts that there are circumstances in which wage subsidies are desirable. There are also circumstances where the provision of unemployment insurance is desirable. Shapiro and Stiglitz suggest that the government could impose a small turnover tax to deter turnover, thus decreasing the flow of job vacancies and the flow out of the unemployment pool, which strengthens the threat of firing. This then allows wages to be lower and employment to be higher.

Fourthly, the S-S model predicts that a series of factors, such as higher rates of labour turnover, higher monitoring costs, higher discount rates for workers, more significant possibilities for workers to vary their effort inputs, or higher costs to employers from shirking, will result in a relatively higher involuntary unemployment rate.

Finally, the model shows how wage distributions for identical workers can persist in equilibrium. In the S-S model, wages play a dual role. One is to allocate labour and another one is to provide incentives for workers' effort. However, firms that find shirking particularly costly will offer higher wages than other firms do. In this case, this dual role allows wage dispersion to persist.

It goes without saying that the S-S model gives us a unique insight into examining and explaining why involuntary unemployment seems to persist in reality. Furthermore, it also provides us with an effective means to analyze and predict other economic phenomena in labour markets. For example, it predicts that wage dispersion for workers with identical skills can exist and persist over sectors, which is hard to explain by conventional neo-classical theories or the human capital approach.

As with most prominent economic theories, the S-S model has received not only praise and recognition, but also, as claimed by Carmichael (1991), generated much controversy and debate. I think this on the one hand reflects profound influences and strong robustness of this model, and on the other hand reveals limitations of this

model. The next section will review the main controversy surrounding the S-S model.

3.3 A General Critique of the Shapiro and Stiglitz No-shirking Efficiency Wage Model

3.3.1 Introduction

Critics of the S-S model do not dispute the idea that an increase in a worker's wage might increase his or her productivity. Rather, they argue other important aspects, such as that some assumptions of this model are inconsistent with reality. The most fundamental critique is the bonding argument (Becker and Stigler, 1974, Lazear, 1981, and Carmichael, 1985), which is discussed in Section 3.3.2. Section 3.3.3 reviews other critiques, in particular critiques from human capital theories (Becker, 1975, Polachek and Siebert, 1993). The empirical evidence is examined in Section 3.3.4. Finally, Section 3.3.5 has a summary.

3.3.2 The Bond Argument

The bond argument suggests that higher than the going market wages are not necessary because firms do use different disciplinary devices, such as either an implicit performance bond like age-earning profiles (Lazear, 1981) and pension schemes (Fisher, 1989) or an explicit bond arrangement like bond and entrance fees (Carmichael, 1985), to elicit workers' effort. This argument suggests that the rents associated with efficiency wages are deferred to the future or/and will be forfeited in the case where a worker is found not to perform satisfactorily, which forces workers to remain with the firm and avoid shirking.

However, bonds are seldom found in reality. Shapiro and Stiglitz (1984) argue that bonds do not arise because unemployed workers can not afford them (imperfect capital market) and a moral hazard exists (the firm may simply take the bond, and claim that the worker has shirked and then fire him or her).

Bull (1987) argues that it is wrong for Shapiro and Stiglitz to suggest that the existence of the moral hazard problem ruin the viability of bonds in reality. Bull shows that in reality the moral hazard problem actually does not necessarily exist. For example, in the United States many firms and workers knew that their 'match' would end with mandatory retirement when the workers turned sixty-five years old. If the claim of Shapiro and Stiglitz (1984) for the moral hazard problem were true, it would be prevalent in reality (for example in USA) for firms to cheat pensions from retiring workers because for firms there would be no future relationship from which to earn a rent by being honest. However, this rarely happens in reality. Why? The answer is simple – it is likely to be more important for a firm to maintain its reputation. This means that firm's concerns with its reputation may eliminate the moral hazard problem. Hence, Carmichael (1991) argues that if a firm can develop a reputation for treating its older workers honestly, then it should also be able to develop one for being honest with younger workers, who have paid their entrance fees.

Carmichael (1985) further argues that there are a number of papers that suggest that an exact solution to this moral hazard problem could be achieved. For example, Bhattacharya (1984) and Malcolmson (1984) suggest in a world with perfect capital markets the workers could pay their bonds into a pension fund, which may be 'refunded' with gains as pensions if they stay in the firm until they retire. Otherwise their pensions would be distributed to *other workers* staying in the firm instead of the firm itself, and thus the moral hazard problem disappears.

Shapiro and Stiglitz's claim of imperfect capital markets is countered by Carmichael (1985). Carmichael agrees that when capital markets are imperfect, an efficiency wage firm can not charge a fee that is large enough to reduce the expected value of a worker's lifetime wages down to that in his or her alternative. But he argues that in this case, few^{er} workers will therefore be hired than in a world of perfect capital markets, and the unemployment rate will be higher. As a worker approaches starvation, his or her utility can be made arbitrarily low relative to the utility of working. Then, the firm can certainly charge a fee sufficient to make the expected utility of its offer equal to that of the alternative. The involuntary nature of the unemployment then disappears.

Some critics argue that implicit performance bonds, which in fact perform the same function as explicit bonds, are widely observed although explicit bond arrangements are seldom found in reality. Becker and Stigler (1974) and Lazear (1981) suggest that firms and workers usually construct deferred compensation or age-earnings profiles to prevent workers from shirking instead of explicit bond arrangements. Firms pay workers less than the value of marginal product (VMP) when they are young and more than VMP when they are old. This payment scheme raises workers' utility at the firm's zero-profit equilibrium above that generated by a profile which pays a worker his or her spot VMP at each point in time. This payment scheme may ensure that workers and firms have less incentive to cheat each other, and hence shirking is likely to be avoided.

3.3.3 Other Critiques of the S-S Model

The S-S model is also criticized from other perspectives, such as human capital theories. For example, the S-S model is attacked to have minimized the effect of personal characteristics such as a person's skill and intelligence but to have over-emphasized the element of chance. In the S-S model, workers line up for high wage jobs and some are accepted largely at random. Other workers end up in poorly paid jobs, not due to lack of talent or fault of their own.

According to human capital theories, some personal characteristics, in particular such as a person's skill and intelligence, are very important. Human capital theories view that a worker's productivity greatly relies on his or her skill and intelligence, and wage is paid in response to his or her productivity. More skill and intelligence a worker holds, more productive he or she will be; More productivity he or she is, higher wage he or she will be paid.

Views with regard to relationship between productivity and wage are fundamentally different between the S-S model and human capital theories. The S-S model suggests that the wage rate is an endogenous parameter. A higher wage rate may lead to workers' higher effort and then higher productivity. In contrast to this, human capital theories argue that higher skill and intelligence of workers rather than a higher wage

rate lead to higher worker's productivity, and wage rates only reflect, rather than determine, workers' productivity.

Human capital theories highlight the importance for a firm to retain workers with specific training (Polachek and Siebert, 1993), but the S-S model seems to take it little into account. The theory of specific human capital (Becker, 1975) asserts that employment is investment that results in fixed costs. It suggests that it is necessary for the firm and workers to share in both costs and returns of investment in specific human capital in order to engender the correct incentives for neither party to interrupt the investment process with a premature quit or dismissal. Post-training wages are above the wage available in other firms thus reducing quits, and worker productivity exceeds worker wages thus reducing layoffs (This is in the firm's own interest rather than 'reputation' claimed by Bull in his model to deter the 'cheating style of layoffs'). Hence, both quit and layoff rates will diminish with tenure, and consequently it is in the interests of both parties (workers and the firm) to cooperate. This is in contrast to the S-S model that suggests that only an efficiency wage with resulting involuntary unemployment may diminish shirking and induce workers to put in effort.

Moreover, the theory of specific human capital debates about high productivity associated with high employment, a key point of the S-S model. It suggests labour productivity goes down rather than up when unemployment is high. This is supported by the claim of Weisskopf *et al.* (1983) on 'capacity utilization'. Weisskopf *et al.* (1983) argues that when capacity utilization is low and machines are idled, i.e.: unemployment is high, trained workers are also idled (but they can be used later in the upturn), and then labour productivity is consequently low rather than high as predicted by the S-S model. Whether workers put in effort is likely to depend upon 'times' rather than unemployment rate. When times are bad (economy is in recession), firms want to hoard workers with specific training. When a good time (economy is in recovery) approaches, the hoarded workers are expected to relax their energy to work hard for the firm.

Other critiques include MacLeod and Malcomson (1998). It criticizes the S-S model for over-emphasizing the role of punishment as a worker's disciplinary device, but

underestimating the role of reward. For example, in reality, beyond the motivator of threat to workers of being dismissed, promises of bonuses and promotions are observed.²³ Bonuses and promotions are used to reward workers for their good performance. Rewards may induce workers to put in high effort, but may not result in involuntary unemployment.

Furthermore, MacLeod and Malcomson suggest that in some cases the threat to a worker of being dismissed does not motivate them at all. For example, consider jobs for which competent workers are relatively scarce, such as sport stars or traders in financial markets. A firm may have paid them a wage rate above the market clearing level, but they could earn higher wages at other jobs and hence the threat to them of being dismissed is not a motivator. This example may extend to other cases where workers are relatively scarce. Threats to them of being dismissed can not to motivate them.

3.3.4 A Review of Empirical Evidence

To date, there have been two distinct empirical approaches to the testing of the efficiency wage hypothesis. The first one attempts to explore the central relationship between wages and productivity based on case studies. While striking at the heart of the efficiency wage hypothesis, this approach has yet to be rigorously pursued and has yielded mostly anecdotal evidence (Riveros and Bouton, 1994). One problem of concern is its limitation to a few case studies and only in developed economies.

The second approach examines wage differentials either across industries, firms and/or occupations, but it has tended to produce only an indirect test and is thus subject to criticism. In fact, some argue that these differentials are neither necessary nor sufficient conditions for the existence of efficiency wages. Moreover, wage differences across industries can arise as a result of compensating differentials or unobservable specific human capital (Riveros and Bouton, 1994), and it is difficult to distinguish empirically between different explanations.

²³See MacLeod and Malcomson (1998) for a survey of evidence, but it seems that there is not yet consensus on whether bonus and promotion should be regarded as a kind of bonds or efficiency wages,

Furthermore, the representative nature of the empirical studies on the efficiency wages is subject to criticism, since most available empirical studies only concentrate on dealing with cases in industrial countries. Therefore, these studies have not been able to capture the particularities of labour markets in developing countries. In particular, they seldom account for some phenomena that are often found in developing countries, for example, where firms have different accesses to formal capital markets or encounter different regulations from the government (In China, difference exists between SOEs and NSOEs. See Chapter 2). However, these factors are crucial and may result in observed wage differentials. Therefore, the empirical studies on efficiency wage models including the S-S model have not provided strong evidence either supporting or refuting the applicability of efficiency wage theories.

3.3.5 Summary

The reviews shown in Section 3.3.2 suggest that critics of the S-S model do not dispute the idea that an increase in a worker's wages might increase his or her productivity, but this by itself is not sufficient to generate an efficiency wage. They argue whether efficiency wages are only effective subject to existence of a large enough unemployment pool in an economy.

The S-S model is criticized to have ignored other measures that a firm can use to attract workers and keep them productive, and it is important to note that these measures do not necessarily lead to involuntary unemployment as claimed by the S-S model in an economy. The fundamental critique is the bond argument, which argues that higher than the going market wages are not necessary because firms can use other different disciplinary devices, such as either implicit or explicit bond arrangement to induce workers to put in effort. In reality, deferred compensation or age-earnings profiles, specific training arrangement, bonuses and promotions are observed to induce workers to put in effort. They do not seem to result with involuntary unemployment. In some cases where workers are relatively scarce, threats to them of being dismissed even can not motivate them. The S-S model, therefore, seems to be inapplicable to these cases.

or something else. Anyway, that bonus and promotion are used to induce workers to put in effort is finalized through rewarding, rather than punishing workers.

Human capital theories criticize the S-S model overlooks the importance of personal characteristics, in particular such as a person's skill and intelligence, but over-emphasizes the element of chance. The theory of specific human capital emphasizes the importance of hoarding and training workers with specific skills. It stresses that high skill workers may generate high productivity, which is in contrast to the S-S model that emphasizes that only efficiency wages lead to high productivity. The capacity utilization argument supports the theory of specific human capital and throws doubt upon the claim of high productivity associated with high unemployment, a key point of the S-S model.

Empirical testing of the S-S model is still in its infancy, which has not yet provided strong evidence either supporting or refuting the applicability of the theory. One problem of concern is empirical tests' limitation. They are criticized to have over-focussed on a few case studies and to have over-concentrated in developed economies.

3.4 Extensions to the S-S Model

Section 3.2 and 3.3 have reviewed the S-S model and critiques of it. This section turns to review extensions to the S-S model. Extensions are developments to a model. If we want to comprehend the S-S model more broadly, it is important for us to look at extensions to it. Meanwhile, by reviewing extensions to it may help us more appropriately apply it into the Chinese contexts.

Strand (1987) reviews and extends the S-S model into the context of heterogeneous labour, by assuming that some of the workers (not all of them) will always have an incentive to shirk and will be fired when being caught shirking. Strand shows that when non-shirkers are alike in his extended model and the S-S model, equilibrium will imply lower unemployment among non-shirkers with efficient screening (precisely screening good workers/non-shirkers from bad ones/shirkers) and higher unemployment with inefficient screening. With perfect screening it may even be possible for a competitive market to support a first-best equilibrium, with no

unemployment at all among good workers, something that was never possible in the S-S model.

In addition, Albrecht and Vroman (1998) extend the S-S model by introducing worker heterogeneity with respect to the disutility of effort. In their model, heterogeneity leads to a problem of adverse selection in addition to the moral hazard problem that is presented in the S-S model. Those workers with the greatest aversion to effort are the most prone to shirking, and this in turn implies that effort-averse workers will be over-represented among the unemployed. Disutility of effort requires a continuously differential distribution of wages to be offered in equilibrium. In this case, an equilibrium in which all firms offer the same efficiency wage can not exist. Rather, there will be multiple equilibrium in a market in response to the continuously differential distribution of wages.

MacLeod and Malcomson (1998) use the theory of self-enforcing agreements and extend the basic efficiency wage model to incorporate more complicated phenomena that the S-S model ignores. For example, the widespread use of performance-related pay based on subjective assessments of performance and the social norms surrounding the concept of a fair wage. The detailed discussion about their model is beyond the aims of this thesis, but one implication of their model is significant for us. This is that it predicts that efficiency wages are only likely to be observed in an economy, where jobs are scarce relative to job seekers. In developing economies like in China, this is a pervasive situation; thus efficiency wages are more likely to be observed.

Strand (1987) suggests more extensions may be made in terms of realistic types of heterogeneity in workers (for example, continuous distributions of worker characteristics), other alternative ways of modeling worker types, and endogenous monitoring and screening etc. It asserts that a real test of the viability of the S-S model lies in successful applications of this model to these issues. It is anticipated that there is still a lot of hard work ahead to test the viability of the S-S model. However, the extensions that we have reviewed show us their contributions to the developments of the S-S model. We may borrow their insights to help us extend the S-S model to the contexts of the Chinese labour market.

3.5 The S-S Model: The Relevance to the Chinese Labour Market

Chapter 2 examined reforms of the Chinese labour market during the past two decades. At the initial stage of reforms, open unemployment in China was intolerable. However, Emergent NSOEs in China under the framework of market economy have started to threaten the viability of SOEs, which makes open unemployment in the state sector unavoidable. To embrace the challenges, SOEs have adopted a series of reform policies including *xiagang* aiming to improve worker's effort.

It is important to look at *xiagang* when we study the Chinese labour market from the perspective of the S-S model. *Xiagang* is a reform policy that typically represents the most distinctive features of reforms in the Chinese labour market.

Xiagang has two important implications that display its distinctive features relevant to no-shirking efficiency wage theories. First, it implies that the likelihood of workers being shifted to *xiagang* is relatively low since part of workers who might have been laid off for the purpose of efficiency in a market economy are now retained in the case of *xiagang*. This implies that the scale of *xiagang* is limited. Consequently, worker's incentives for effort are reduced. Second, *xiagang* workers have to be paid allowances and social welfare, such as health care and accommodation service, by their enterprise. This reduces the costs to workers of being shifted to *xiagang*. Hence, this reduces workers' incentives for effort. This suggests that *xiagang* in the contexts of the Chinese labour market does not serve a role of imposing costs on laid-off workers as strongly as predicted by the S-S model.

In contrast to the state sector, NSOEs have an absolute power to lay off workers within their own discretion. In addition, the laid-off workers in the non-state sector do not obtain allowances and other social welfare. The unemployment pool in the non-state sector is huge, given that there are overwhelming workers flowing in from increasingly liberated rural areas. All of these factors increase the costs to workers of being laid off in the non-state sector.

This implies that in the state sector, worker's incentive for effort will be low relative to that in the non-state sector. In terms of no-shirking efficiency wage theories, for a given rise of wages, workers in the non-state sector are more likely to put in higher effort than those in the state sector. Hence, labour productivity in NSOEs is more likely to be higher than that in SOEs.

However, consider the real wage difference between on-the-job and *xiagang* workers, *xiagang* definitely means costs to caught shirkers to a certain extent. Hence, we may assume it plays a role in inducing workers to put in effort. This suggests that it is inappropriate to ignore the existence of *xiagang* when we apply efficiency wage theories to study the Chinese labour market.

An extensive literature shows that in the Chinese labour market, unskilled workers tend to seek jobs in the state sector, but skilled workers tend to flow from SOEs into NSOEs (Dai and Li, 1991; Li, 1997; and Gordon and LI, 1999). This implies that workers in SOEs are more likely to be heterogeneous rather than homogeneous as assumed in the S-S model. Dai and Li (1991) suggest this phenomenon show that there are different degrees of concerns about risks between skilled and unskilled workers. Skilled workers are more likely to be risk neutral. They, therefore, tend to give up the 'iron rice bowl' and enter the non-state sector.²⁴ Unskilled workers are more likely to be risk averse. They, therefore, are more likely to tend to enter SOEs in pursuit of work's stability.

This represents another distinctive characteristic of the Chinese labour market. When we apply the S-S model into the Chinese labour market, the heterogeneity of workers is worth being taken into account. This requires an extension to the S-S model since the S-S model assumes that workers are homogeneous. This extension may ensure that the outcomes of my thesis will be more relevant to the contexts of the Chinese labour market.

²⁴ In Chinese it is called 'xiahai' ('dive into the market'). It implies that workers in SOEs give up their jobs and enter the non-state sector. This does not only require workers' courage but also ability and intelligence.

Finally, one question may be raised: why the Chinese government does not advocate bond arrangements to encourage workers to put in effort. Bond arrangements suggest that involuntary unemployment is unnecessary. This implies that bond arrangements may improve productivity in SOEs, but may not necessarily result in such a large number of lay-off workers as assumed under the framework of efficiency wage theories. This seems to provide a better option that may successfully avoid a trade-off between maintaining social stability and improving productivity.

Nevertheless, explicit bonds are seldom observed in the state sector. Imperfect capital markets and moral hazard problems may be two key factors that contribute to the absence of explicit bonds in the Chinese labour market. It is important to note that overstaffing and under-employment as reviewed in Chapter 2 are a common phenomenon in the state sector. This implies that job vacancies are scarce relative to job seekers. According to MacLeod and Malcomson (1993, 1998), this situation means that only an efficiency wage rather than bonds may motivate workers to put in effort. If bond arrangements are used, they are very likely to induce firms to forfeit workers' bonds and then lay them off without cost, given that firms face a large number of workers with identical skills queuing outside to compete for vacancies left by laid-off workers.

Implicit bonds, such as experience-earning profile, do exist in the Chinese labour market. However, Meng and Kidd (1997) suggest that implicit bond arrangements do not produce a desired effort level from workers in the state sector. It is interesting to note that Japan's experience-earning profile is similar to that of China, but in Japan it seems to have a positive impact on workers' effort. Meng and Kidd argue that this may be due to that Japanese firms can hire and lay off workers freely and Japanese workers can seek and quit jobs freely, but Chinese firms and workers can not form or terminate their employment relationship as freely as their Japanese counterparts can. In China, experience-earning profile is more likely to represent a relationship between seniority and earnings, but less likely to encourage workers to put in effort.

3.6 Reviews of Others' Literature that Applies Efficiency Wage Theories into the Context of the Chinese Labour Market

In the introductory chapter, I mentioned that there is little literature studying the Chinese labour market in terms of efficiency wage theories. The exceptions are Li's (1997) and Lu and Cheng's (1999), whose literature, by using the principles of efficiency wage theories, investigates why worker's productivity in the state sector is relatively low.

Li (1997) elaborates his model, by using conventional demand and supply curves for both skilled and unskilled workers, aiming at exploring why productivity in state-owned enterprises is relatively low. Because wages in SOEs are assumed to be fixed equally or with minor divergences for all workers, this model assumes that the demand for labour in the state sector is horizontal or only has a minor downward slope (see D_g in Fig. 3.2). However, the demand curves for skilled and non-skilled workers in the non-state sector are downward sloping with a relatively large slope as curves LMP_s and LMP_n respectively (see Fig.: 3.2) in terms of their labour's marginal productivity.

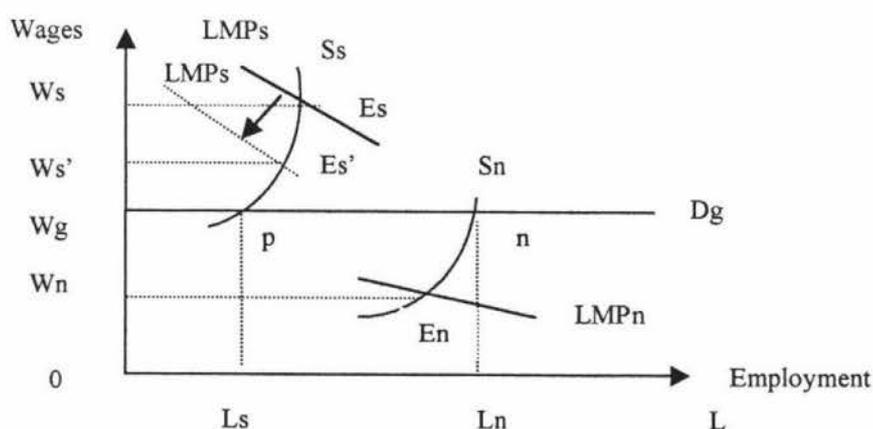


Fig.3.2: Li's model (1997) of wage-employment relationships in the state sector and non-state sector.

In the state sector, both skilled and non-skilled workers are assumed to be paid identical wages W_g , which are determined by the government and are higher than the wage rate W_n received by unskilled workers in NSOEs, but lower than the wage rate W_s paid to skilled workers in NSOEs. The wages W_n and W_s are determined by demand and supply curves in labour markets for both types of workers. We note that a low rate (W_g) paid to skilled workers in SOEs relative to the wage rate (W_s) paid to those in NSOEs will induce them to put in less effort, and thus their productivity will be lower. If LMP curve represents their theoretical labour's marginal productivity. Their actual LMP curve will be LMP' that is an inward shift of LMP.

However, in terms of efficiency wage theories, will unskilled workers put in much effort in response to their highly paid wages (W_g) associated with their theoretical should-pay wage (W_n)? It looks to be possible. But Li denies this possibility. He asserts that this is due to lack of a mechanism that punishes shirking workers in the state sector. In the state sector, workers are paid equally regardless of performance, which tends to induce workers to put in less effort. We should note that, in terms of efficiency wage theories, higher wages do not naturally and directly induce workers to put in effort. Only when higher wages are converted into genuine and large enough costs to shirking workers of being laid off, will workers tend to put in effort.

In general, the implications of Li's model may be summarized as follows:

1. The existence of wage gaps (of $W_p - W_g$ and $W_g - W_n$) has intensified and distorted the fluidity of labour force between the state sector and the non-state sector. The former gap ($W_p - W_g$) encourages skilled workers to flow out from the state sector into the non-state sector, but the latter gap ($W_g - W_n$) tends to encourage unskilled workers to flow out from the non-state sector into the state sector. Losses always go to the state sector, and gains come to the non-state sector.
2. However, the artificial institutional barriers in the state sector, such as *hukou* and the unique social welfare system, eventually deter skilled workers from moving out from SOEs. Therefore, they are arbitrarily forced to stay in the state sector. In this case, in terms of efficiency wage theories, skilled workers are likely to put in less effort in response to their lowly paid wages. Consequently, the whole economy

suffers efficiency losses from these skilled workers. The fiercer the institutional barriers are, the greater the losses will be.

3. The wage gaps between the state sector and non-state sector also tend to distort the rational allocation of labour force. Fig. 3.2 indicates that low wages lead to a reduction of skilled labour force in the state sector from 'WsEs' to '0Ls'. In contrast to that, high wages paid to unskilled workers in the state sector tend to enlarge the supply of unskilled labour in SOEs from 'WnEn' to the current '0Ln'.

4. The wage gaps tend to induce the government to give priority to hire skilled workers in order to develop capital-intensive industries for higher returns, but discourage hiring of unskilled workers to develop labour-intensive industries. This policy may result in two traps for the government. One is that the government has an incentive to hire more skilled workers for the development of capital-intensive industries, but use them inefficiently. Another trap is that the government tends to ignore the development of labour-intensive industries, but pay unskilled workers wages beyond their LMP, which eventually makes the situation of labour-intensive industries worse and worse.

5. Finally, the model suggests that, if the present wage system remains intact, the wage disparity between workers in the state sector and the non-state sector will grow.

Nevertheless, in terms of our reviews in Chapter 2, the assumptions of Li's model seem to be more relevant to the first stage of reforms in China, rather than to the second stage. For example, Li does not take into account some important ingredients of the Chinese labour market into his model, such as the emergence of '*xiagang*' in state-owned enterprises at the second stage of reforms. The emergence of *xiagang* means that either skilled or unskilled workers in the state sector will face some costs to them of being shifted to *xiagang*, rather than having nothing to lose as claimed by Li. Therefore, the actual meaning and accuracy of its implications are subject to criticism.

Xiagang is introduced by Lu and Cheng (1998). Lu and Cheng use efficiency wage theories to examine and compare the differences of workers' effort levels in state-owned enterprises under two circumstances. One circumstance is when the operation of SOEs is constrained with limitation to the wage gap between on-the-job workers

and *xiagang* workers and/or to the scale of *xiagang* workers. In this case, every increment of on-the-job workers' wages over *xiagang* workers generates a lower increment of effort level in relation to the marginal effort level. In other words, for a given real wage increase, the optimal effort level of on-the-job workers in a situation with constraints will decline in comparison with the one without constraints.

Another circumstance is when SOEs operate without any constraints, apart from with *xiagang* workers, where it is found that every increment of on-the-job workers' wages over *xiagang* workers generates an increment of effort levels equaling the marginal effort level. This says the effort elasticity of on-the-job workers with respect to the real wage difference between on-the-job and *xiagang* workers equals one unit. This is the well-known 'Solow condition' in the efficiency wage literature (Akerlof and Yallen, 1986). It implies that in this case a firm will set the wage rate such that the elasticity of effort with respect to the real wage rate difference between on-the-job and *xiagang* workers is unity. This wage rate will minimize labour costs per efficiency unit of labour, thus it is also called the 'efficiency wage'.

In addition, they have also compared effort levels in SOEs with those in NSOEs. NSOEs are assumed to operate without dealing with *xiagang* workers and other constraints as in SOEs. It is found that the effort level in the state sector is always lower than that in the non-state sector for a give real wage level. Lu and Cheng account for it through the illustration of fig.3.3. They assume that workers are identical and have *same* utility of effort function. Therefore, their effort function is identical. The only difference between them is that the allowances \underline{w} for *xiagang* workers in SOEs are higher than the unemployment benefits ω paid to the unemployed in the non-state sector.²⁵ If the effort function curve for workers in SOEs is represented by $e = e(w - \underline{w})$, then the effort function curve for workers in NSOEs may be represented by $e = e(w - \omega)$. This implies that in Fig. 3.3, the effort function curve for workers in NSOEs is only a paralleling shift of the curve of workers in SOEs to the left by a distance of $(\underline{w} - \omega)$. The tangent line for SOE's effort

²⁵ Actually, in the non-state sector most workers do not have insurance of unemployment. Therefore, when they are laid off, they can not get any unemployment benefits. Here Lu and Cheng assume an existence of unemployment benefits, which may aim to ensure their model may be used in a wide extent. For the case without unemployment benefits, we may set the unemployment benefits equal zero, but this may not change the outcomes.

function curve $\underline{w}A$ starts from the point \underline{w} , but for NSOE's curve, the tangent line OC rays from the point O . They assert that it is provable that the optimal effort level in the state sector (e_0) is always lower than that (e') in the NSOEs.²⁶

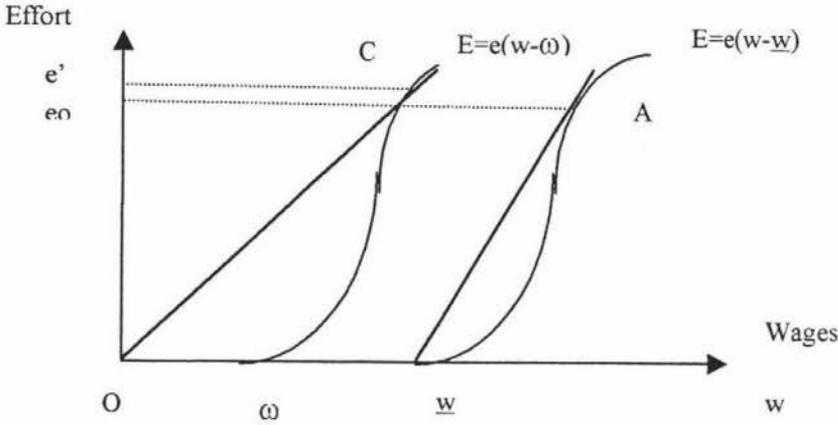


Fig.3.3: Effort function curves of both SOEs and NSOEs

Effort levels in Lu and Cheng's model are assumed to only rely on the wage difference between on-the-job workers and off-the-job workers within the same sector. From my point of view, this assumption is too simplified and is inconsistent with reality. It ignores interactions between two sectors. For example, the literature shows worker's effort levels in the state sector are also related to wage levels and unemployment rate in the non-state sector (Li, 1997), but worker's effort levels in the non-state sector are less relevant to the situation of the state sector. Chapter 2 reviewed that workers in the non-state sector have little chance to enter the state sector. If these are taken into account, it is no longer plausible to assume that effort function of both SOEs and NSOEs is identical. Another major deficiency of Lu and Cheng's model is that the heterogeneity of workers is entirely overlooked.

My thesis aims at developing a theoretical model, which is more relevant to the context of the Chinese labour market. This requires taking into account the properties of *xiagang* and the government's objective of maintaining social stability. The heterogeneity of workers should be also considered. I will undertake a comparative static analysis, based on the S-S model, to examine the relationship between social stability and a range of variables such as workers' wages, effort levels, employment,

²⁶From my point of view, their claim for tangent lines to start from different points is questionable. It

output, productivity, and profitability in SOEs. This will enhance our comprehension in Chinese labour market reforms from the perspective of no-shirking efficiency wage theories with new theoretic depth and breadth. The following chapter will explore them in detail.

3.7 Conclusions

This chapter reviewed the merits and limitations of the S-S model and its relevance to the Chinese labour market. It emphasizes that the trade-off between social stability and productivity improvement is one of the most important features of reforms in the state sector and it is inherent in the reform policy of *xiagang*. The heterogeneity of workers towards risks is another feature of the Chinese labour market. Main weakness of other literature that has applied efficiency wage theories to the Chinese contexts is that these features are ignored. Therefore, it is important to extend the S-S model to include these features when we apply it to the Chinese contexts.

Chapter 4: The No-Shirking Efficiency Wage Model in the Context of the Chinese Labour Market

4.1 Introduction

The foregoing two chapters reviewed the characteristics of the Chinese labour market in the transition period and the relevance of the S-S model. We also looked at Lu and Cheng's model (1998) and Li's model (1997), which, from the perspectives of efficiency wage theories, analyzed why productivity or effort levels in the state sector was relatively low. However, they ignored some distinctive and important features relevant to the Chinese context such as *xiagang* and workers' heterogeneity.

My thesis aims to extend the S-S model to take these features into account and highlight the concern about social stability that is relevant to the Chinese context. To highlight the concern with social stability in SOEs, I introduce an exogenous social stability parameter into my model, which reflects the likelihood of workers being shifted to *xiagang*. By undertaking a comparative static analysis, I examine the relationship between social stability and a range of variables including wages, effort levels, employment, output, productivity and profitability in SOEs.

The basic characteristics of the Chinese labour market in the transition may be outlined as follows:

- A dual labour market
- Labour market reforms in SOEs undertaken under the guideline of balancing the objective of improving enterprise productivity against that of maintaining social stability. *Xiagang* workers emerged.
- The scale of *xiagang* workers and the real wage difference between on-the-job workers and *xiagang* workers are limited. SOEs are not allowed to freely lay off shirking workers, and *xiagang* workers have to be paid certain wages by the enterprises. In contrast to this, NSOEs may freely dismiss shirking workers without paying any off-the-job wages. Therefore, *xiagang* is a cost to a caught shirker in SOEs, but the penalty for shirking in SOEs is weak relative to that in NSOEs.

The following section will establish the framework of my model and extend the S-S model with these basic characteristics in the context of the Chinese labour market. Section 4.3 will undertake a comparative static analysis on the model and demonstrate implications of this model. Finally, summaries will be offered in Section 4.4.

4.2 The Basic Assumptions of the Model

We consider a continuous-time model in which individuals are infinitely lived. Workers tend to enjoy on-the-job leisure, and thus would prefer to shirk. Firms can not perfectly monitor their workers. Efficiency wages are paid to induce workers to put in effort. ²⁷ *Xiagang* is the most serious punishment workers may suffer if caught shirking.

Now we turn to look at a representative worker's effort decision and a representative firm's decision separately:

4.2.1 Workers Effort Decision

This part closely follows Pisauro's (1991) representation of the effort decision. A worker's utility positively depends on real wage (w), and negatively relates to the degree of effort level e . The worker's utility function μ is additively separable in the utility v from real wage w and effort e in either the state sector or the non-state sector, which may be expressed by Eq. (1) as follows:

$$\mu = v(w) - e \tag{1}$$

The sub-utility function v is assumed to be strictly concave, thus

$$v' > 0, v'' < 0 \text{ and } v(0) = 0.$$

The utility function μ is linear in effort. Effort e , which is set to be $0 \leq e \leq 1$, may be viewed as the fraction of working time during which the required productivity is achieved because the worker is not shirking. Total working time is normalized to one unit, then $e = 1$ implies that the worker has never shirked, and $e = 0$ implies that the worker does not put in effort at all, like *xiagang* workers.

To distinguish worker's utility function in the state sector from those in the non-state sector, on-the-job workers in the state sector are assumed to receive real wage w , and to put forth their effort level e . Consider the unique feature of *xiagang*, i.e., *xiagang* workers still receive real wage \underline{w} from their enterprise, it is plausible for us to assume that on-the-job worker's sub-utility function v relates to the real wage difference between them and *xiagang* workers, i.e., $(w - \underline{w})$ rather than merely to the real wage of themselves. Similarly, workers in the non-state sector are assumed to be paid real wage \hat{w} and to put in their effort level \hat{e} . But, in the non-state sector, unemployed workers do not receive wages from their enterprise or the state; thus it is plausible to assume that their on-the-job worker's sub-utility function v only relates to their real wage \hat{w} .

Therefore, equation (1) can be expressed as follows in terms of workers in either the state sector or the non-state sector respectively:

$$\mu = v(w - \underline{w}) - e \tag{1'}$$

$$\mu = v(\hat{w}) - \hat{e} \tag{1''}$$

Generally speaking, a worker in SOEs faces three choices for his or her utility stream. When one is never *Xiagang*, then he or she will receive a wage w and put forth effort e in SOEs. The second is that he or she is shifted to *Xiagang*, but finds another job in NSOEs with a probability $(1-u)$, then his or her alternative wage and effort level in NSOEs will be \hat{w} and \hat{e} . The last one is when he or she is shifted to

²⁷According to the review in Section 3.5, as job vacancies are scarce relative to job seekers in the Chinese labour market, efficiency wages are observed in the Chinese labour market. Worker's other discipline device rather than *xiagang* may be ignored here.

xiagang, and remains unemployed with the opposite probability u , then no effort is required and the income will amount to \underline{w} .

In contrast to the non-state sector, consider a firm in the state sector having to carry out the government's employment policy, which requires limiting the scale of *xiagang* workers. This has been discussed in the part '*Xiagang*: A new phase of Chinese labour market reforms in the state sector' of Section 2.3.2. In this case, if we assume the normal likelihood of an employee being found shirking is denoted by $\underline{\rho}$, then now in SOEs the actual likelihood of this employee being shifted to *xiagang* would be lower than $\underline{\rho}$. To simplify it, we may interpret it in mathematics and say there is a *discount* for the normal likelihood of a shirking worker being shifted to *xiagang*. This means that there is a probability of a caught shirking worker being retained as an on-the-job worker, and this discount rate influences the actual likelihood of this caught shirking worker being shifted to *xiagang*. Assume this discount rate is denoted by λ , which we may call a *social stability parameter*. Assume the actual likelihood of a caught shirking worker being shifted to *xiagang* is denoted by ρ , then it will be expressed as:

$$\rho = \underline{\rho} - \underline{\rho}\lambda = \underline{\rho}(1-\lambda) \tag{2}$$

λ is the exogenous variable, determined and manipulated by the government. The value of λ is assumed to be between zero and one. When λ is one, it represents that the government does not allow the existence of *xiagang*. When λ is zero, it means that all normally detected shirking workers are shifted to *xiagang* without 'discount'. The relationship between ρ and λ is negative. The larger λ is, the lower the likelihood of the worker being shifted to *xiagang*, and hence greater social stability.

In accordance with Pisauro (1991), the likelihood of being detected shirking $\underline{\rho}$ can be expressed as:²⁸

²⁸The original literature expresses it as $p = s(1-e)$. The parameter s measures the intensity of monitoring or supervision. Here I assume it to be one to simplify my model, but it does not effect the final outcomes that I am concerned about. In other literature, the similar assumption is made. One example is Lin and Lai's literature (1997) that also assumes that s equals one when they examine the Solow condition in the contexts of employees with overtime work.

$$\rho = \rho(e) = 1-e \quad 0 \leq e \leq 1 \quad (2a)$$

If the actual likelihood of the worker being shifted to *xiagang* ρ is adjusted by the ‘social stability parameter’, we can then combine Eq.(2) with Eq.(2a) and produce Eq.(2’) as follows:

$$\rho = (1-e)(1-\lambda) \quad 0 \leq e \leq 1, 0 \leq \lambda \leq 1 \quad (2')$$

For $e = 1$, $\rho = 0$ holds regardless of λ value. This implies that in this case (workers never shirk), the ‘social stability parameter’ does not influence the likelihood of workers being shifted to *xiagang*. The probability of *xiagang* is always zero. For $e = 0$, $\rho = 1-\lambda$. This implies that the ‘social stability parameter’ is decisive for ρ . If the government requires full employment, this implies the social stability parameter is unity. Then $\rho = 0$ holds. Nobody is shifted to *xiagang* regardless of performance, which is the case of the pre-reform Chinese labour market. If $\lambda = 0$, $\rho = (1-e)$ holds, which is the same as Eq. (2a). This implies that in this case the government’s interference for social stability disappears.

Assume N denotes the total number employed in the state sector (including *xiagang* workers), then the number of on-the-job effective workers denoted by L will be:

$$L = N - N\rho \quad (3)$$

Replacing ρ in Eq. (3) by Eq. (2’), we get:

$$L = N[1-(1-e)(1-\lambda)] = N[e + (1-e)\lambda] \quad (3')$$

To simplify our discussions, the discounting rate for utility is assumed to be zero. Therefore, in terms of Eq.(1) and (1’), the expected utility $E(U)$ of an individual in SOEs who might shirk is defined by:

$$E(U) = [v(\underline{w}) - e](1-\rho) + [v(\hat{w}) - \hat{e}]\rho(1-u) + v(\underline{w})\rho u \quad (4)$$

Eq.(4) implies that there are three states that a worker in the state sector may be in. Firstly, not being shifted to *xiagang* and receiving real wage w , with the probability $(1-\rho)$. Secondly, being shifted to *xiagang*, but finding another job with real wage \hat{w} in the non-state sector, under the associated probability of $\rho(1-u)$. Finally, being shifted to *xiagang* and staying at home with allowance \underline{w} with corresponding probability of ρu .

Replacing ρ with equation (2') into Eq.(4), it becomes:

$$E(U) = [v(w-\underline{w}) - e][1 - (1-e)(1-\lambda)] + [v(\hat{w}) - \hat{e}](1-u)(1-e)(1-\lambda) + v(\underline{w})u(1-e)(1-\lambda) \quad (4')$$

Maximizing $E(U)$ with respect to e , Eq.(4') becomes:

$$\frac{\partial E}{\partial e} = (-1)[1 - (1-e)(1-\lambda)] + [v(w-\underline{w}) - e](1-\lambda) + [v(\hat{w}) - \hat{e}](1-u)(-1)(1-\lambda) + v(\underline{w})(-1)(1-\lambda)u = 0 \quad (5)$$

Moving all items with e in Eq.(5) to the left and others to the right side, and then rearranging it, we obtain the optimal level of effort e.g.: the worker's effort function in SOEs as follows, which representative workers in SOEs will choose for a given wage offered by the firm in terms of the S-S model. Here the wage is endogenous.

$$e = [v(w-\underline{w}) - k - \lambda/(1-\lambda)]/2 \quad (6)$$

Where: $k = [v(\hat{w}) - \hat{e}](1-u) + v(\underline{w})u$

As assumed before, the optimal effort e is bounded by zero from below and by one from above. For the subsequent analysis, this restriction is assumed to hold, such that no corner solutions occur. The effort function is strictly concave in $w-\underline{w}$ (i.e.: $e' > 0$, and $e'' < 0$).

4.2.2 Firms' Decision

The firm chooses the combination of employment and wages to maximize its profits with the constraint set out by the government (e.g. social stability parameter). To simplify our analysis without fundamental influences to our outcomes, assume the optimal stock of capital and other inputs rather than labour are given and normalized to zero, so we will focus on the impact of changes in the price of labour. Effort and employment are assumed to be perfect substitutes.

It is assumed that a firm's production function $f(L)$ is strictly concave ($f' > 0, f'' < 0$). *Xiagang* workers are paid subsistence allowance \underline{w} , the profits are given by:

$$\pi = f(eL) - wL - (N-L)\underline{w} \quad (7)$$

Maximizing π with respect to w and L yields the first order condition for (7):

$$\frac{\partial \pi}{\partial w} = Le^{(w-\underline{w})}f' - L = 0 \quad \Leftrightarrow \quad e^{(w-\underline{w})} = 1/f' \quad (8)$$

$$\frac{\partial \pi}{\partial L} = ef' - w + \underline{w} = 0 \quad \Leftrightarrow \quad e = (w-\underline{w})/f' \quad (9)$$

Combine equation (8) with (9), then yield:

$$e = (w-\underline{w}) e^{(w-\underline{w})} \quad \Leftrightarrow \quad e^{(w-\underline{w})} = e/(w-\underline{w}) \quad (9a)$$

This is same as the famous Solow condition that we discussed in Section 3.6 with regard to Lu and Cheng's model (1998). This equation implies that worker's effort elasticity with respect to the real wage difference between an on-the-job worker and a *xiagang* worker is unity. To facilitate of using it to examine the real wage effect of alternations in the social stability parameter λ , we combine Eq. (6) with Eq.(9a) and yield:

$$[v(w-\underline{w}) - k - \lambda/(1-\lambda)]/2 = (w-\underline{w}) e^{(w-\underline{w})} \quad (9b)$$

Derive Eq.(6) with respect to w and get : $e'(w-\underline{w}) = v'(w-\underline{w})/2$. Put it into (9b), we get an equation that integrates the social stability parameter with real wages, which we assume it as 'F', as follows:

$$F \equiv (w-\underline{w})v'(w-\underline{w}) - v(w-\underline{w}) + \lambda/(\lambda -1) + k = 0 \quad (10)$$

4.3 Comparative Statics

In this section, we will examine the effect of the social stability parameter λ on other variables starting with the real wage rate.

4.3.1 Wage

Based on Eq.(10), we now examine the relationship between $(w-\underline{w})$ and λ . Derive it with respect to λ , then yield:

$$\begin{aligned} d(w-\underline{w})/d\lambda &= -F'(\lambda)/F'(w-\underline{w}) \\ &= -\{[(1-\lambda)+ \lambda]/(1-\lambda)^2\}/[(w-\underline{w})v''(w-\underline{w})] \\ &= -1/[(w-\underline{w})(1-\lambda)^2v''(w-\underline{w})] \end{aligned} \quad (11)$$

We have assumed that the sub-utility function v is strictly concave. Hence, $v''(w-\underline{w}) < 0$, then Eq. (11) is positive, i.e., $d(w-\underline{w})/d\lambda > 0$. This implies that greater λ will generate higher efficiency wages in SOEs.

Fig. 4.1 indicates that while λ increases from λ_1 to λ_2 , the effort curve shifts outwards and the wage in response to the optimal effort rises from $(w_1-\underline{w})$ to $(w_2-\underline{w})$ accordingly.

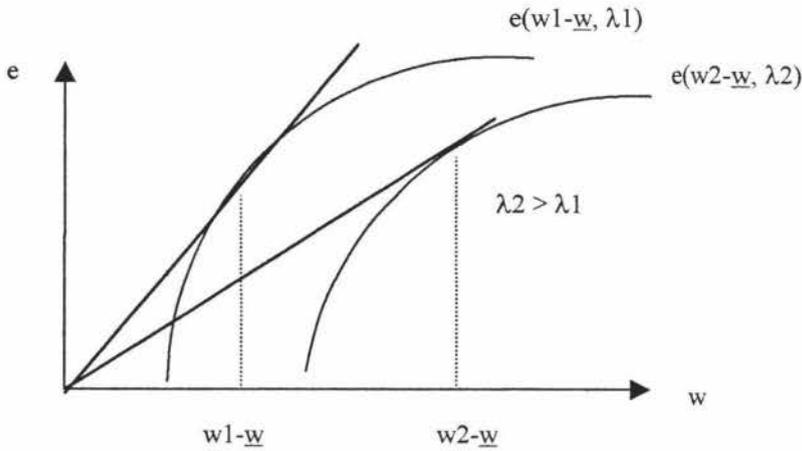


Fig. 4.1 Effort Curves

Why does it look like this? This may be viewed in two ways: on the one hand, a greater λ implies that a bigger fraction of detected shirking workers will be retained and will thus reduce the threat of *xiagang* while other factors remain unchanged. Workers are more likely to put forth less effort in order to enjoy more leisure time. On the other hand, in order to offset this negative impact on efficiency, the firm tends to raise real wage difference between on-the-job workers and *xiagang* workers large enough to make on-the-job workers value their posts highly, and then put in more effort.

4.3.2 Optimal Effort Levels

Fig. 4.1 also implies that the impact of increasing λ on effort is ambiguous. How can we account for this phenomenon? Using Eq. (6) and considering the relationship between real wage difference and λ as demonstrated by Eq.(11), i.e., substituting for $w'(\lambda) = \partial(w-\underline{w})/\partial\lambda$, the impact of variations of λ on the optimal level of effort $e^* = e[w(\lambda), \lambda]$ can be shown to relate to the extent of the workers' risk aversion:

$$\begin{aligned} de^*/d\lambda &= e'(\lambda) + e'(w-\underline{w})w'(\lambda) \\ &= -(1-\lambda + \lambda)/2(1-\lambda)^2 - v'(w-\underline{w})/2[(w-\underline{w})(1-\lambda)^2v''(w-\underline{w})] \end{aligned}$$

$$= (1-p)/2p(1-\lambda)^2 \quad (12)$$

$$de*/d\lambda \geq 0 \quad \text{iff } 0 < p \leq 1 \quad (12a)$$

$$\text{or } de*/d\lambda < 0 \quad \text{iff } p > 1 \quad (12b)$$

where p is the Arrow-Pratt measure of relative risk aversion defined by $p = -v''(w-\underline{w})(w-\underline{w})/v'(w-\underline{w}) > 0$ (Goerke, 1998). While p is not greater than unity, the optimal effort level will increase with λ . The less p is, the greater the wage-difference-induced increase in effort will be due to the rise in λ and $e'(w-\underline{w})w'(\lambda)$, because the wage difference of risk-averse workers need not to be increased much to obtain an optimal effort again. This is probably the case for unskilled workers. In section 3.5, we discussed that unskilled workers are more likely to be risk-averse since they are in weak position to get new jobs in NSOEs while being shifted to *xiagang*. Furthermore, jobs in NSOEs are regarded as less secure. Hence, they are likely to value their jobs much more for a given increase of the wage difference in terms of an increase of λ . This finding contrasts with Lu and Cheng's (1998) (see Section 3.6), who consider that for a given efficiency wage, the optimal effort level always declines when there is some kind of government intervention, such as limiting the scale of *xiagang* workers. This is probably due to the fact that Lu and Cheng ignore the characteristic of worker's heterogeneity, while my model developed here has taken this into account.

For skilled workers, they are more likely to belong to the case with p greater than one unit. In Section 3.5, we have also discussed that skilled workers are more likely to be risk neutral since they are easier to find new jobs in NSOEs while being shifted to *xiagang*. The literature shows that in reality many skilled workers tend to flow from SOEs into NSOEs (Li, 1997). In this case, the greater p is, the less the wage-difference-induced increase in effort will be due to the rise in λ and $e'(w-\underline{w})w'(\lambda)$. This means a bigger increase of the wage difference is required to induce risk-neutral workers to put in their optimal effort level.

However, on the one hand, the government usually increases wages equally for both skilled workers and unskilled workers (Li, 1997). As Li suggests, the increased wage

level is likely to be beyond unskilled worker's expectation and higher than their LMP; thus it tends to be highly valued by unskilled workers. But, it is likely to be below skilled worker's expectation and lower than their LMP; thus it tends to be less valued by skilled workers (Li, 1997, and see Section 3.6). This makes skilled workers have a strong incentive to flow out from SOEs to NSOEs where they may receive higher real wage that may be in line with their LMP.

On the other hand, a rise of λ implies that the institutional restrictions to worker's mobility may become severer. This means that the costs to skilled workers' mobility increase and therefore the likelihood of their mobility decreases. In turn, they, while being reluctant but more rigorously forced to stay at SOEs, may tend to put in less effort as passive obedience. Therefore, their optimal effort levels may fall.

4.3.3 Employment

Based on Eq. (3'), the employment consequences of 'pursuing social stability' in the state sector can be derived:

$$\begin{aligned} dL/d\lambda &= [(1-e) - \lambda de^*/d\lambda + de/d\lambda]N \\ &= [(1-e) + (1-\lambda)de^*/d\lambda]N \end{aligned} \quad (13)$$

Where iff $0 < p \leq 1$, then from Eq.(12a), we know that $de^*/d\lambda > 0$. Then, each part in Eq.(13) is positive. Thus, we can predict:

$$dL/d\lambda > 0 \quad (13a)$$

And where if $p > 1$, then $de^*/d\lambda < 0$ in terms of Eq.(12b), thus the first part of Eq. (13), i.e., $(1-e)$ is positive, but the second part, i.e., $(1-\lambda)de/d\lambda$ is negative. In total, it is indeterminate. It may be either positive or negative.

Eq. (13a) implies that with an increase of λ , the employment of unskilled workers will increase in the state sector, but for skilled workers, it is uncertain. This

implication seems to be consistent with many empirical observations (Maurer-Fazio, 1995, Li, 1997, Dai and Li, 1991 and Gordon and Li, 1999), which have been reviewed in Section 3.5 and 3.6. The literature shows that unskilled workers tend to flow into SOEs and skilled workers tend to flow out from SOEs into NSOEs (Maurer-Fazio, 1995, Dai and Li, 1991, and Gordon and Li, 1999), but why my model predicts that with an increase of λ , changes of the employment of skilled workers are indeterminate rather than definitely negative?

I think that the reasons that we used to account for why skilled workers' optimal effort levels fall may be used here to justify it. On the one hand, with higher λ , skilled workers are less satisfied with their real wages. They hence value their posts in the state sector less. In addition, they are relatively easy to find jobs in NSOEs. They hence have a strong incentive to move away from SOEs into NSOEs. On the other hand, the severer institutional barriers such as *hukou* system with a rise of λ more rigorously prevent skilled workers from flowing out. This may increase the costs to skilled workers of moving from SOEs to NSOEs and thus reduce their incentive for moving. Moreover, according to Li's examination (1997), SOEs always have a strong incentive to hire more skilled workers to make gains from them (See Section 3.6). Hence, skilled workers may be hoarded in SOEs. In total, the employment of skilled workers is indeterminate. It may rise or decline.

4.3.4 Output

With regard to output Q , its change with an increase of λ is ambiguous. Output can be expressed by $Q = f(eL)$. The change in Q due to a rise of λ at the firm's optimum is given by:

$$dQ/d\lambda = (Lde*/d\lambda) f'(eL) + (eL/d\lambda)f'(eL) \quad (14)$$

Combine Eq.(3') and Eq.(13) with Eq.(14), it becomes:

$$\begin{aligned} dQ/d\lambda &= N(e + \lambda - e\lambda) f'(eL) de*/d\lambda + [(1-e) + (1-\lambda)de*/d\lambda]eNf'(eL) \\ &= \{[2e(1-\lambda) + \lambda] de*/d\lambda + e(1-e)\}Nf'(eL) \quad (14') \end{aligned}$$

iff $0 < p \leq 1$, according to Eq.(12a), then $de^*/d\lambda > 0$. Thus, we can identify that:

$$[2e(1-\lambda) + \lambda] de^*/d\lambda > 0 \text{ (here each component is positive)}$$

We know that $Nf'(eL)$ and $e(1-e)$ are also positive. Put them together, Eq.(14') will hence be positive. This implies output changes positively with λ while p is not greater than one. This implication seems to be straightforward because for unskilled workers, both their employment and optimal effort levels rise with an increase of λ , and hence the output produced by them goes up.

How will output change with an rise of λ when p is greater than one? Let us assume that p is greater than one, i.e., Iff $p > 1$. According to 12(b), then $de^*/d\lambda < 0$. Thus, for the part of $[2e(1-\lambda) + \lambda] de^*/d\lambda$ of Eq.(14'), we can identify it as negative. However, the other part, i.e., $e(1-e)$, of Eq.(14') is positive. Put them together, their sum will be indeterminate. Therefore, in this case, the sign of Eq.(14') is indeterminate. It might be either positive or negative. This implies that for skilled workers, with an increase of λ , their output might either rise or decline. We may account for this phenomenon as follows:

Eq.(12b) predicts that with an increase of λ , skilled workers' optimal effort levels decline, but the number of their employment is indeterminate. If there is an increase of employment, which brings output with a gain. If the gain is larger than the loss caused due to their low optimal effort levels, then output will rise. In contrast to this, if their employment decreases, their output will fall further associated with their low optimal effort levels. Overall, output may rise or fall.

4.3.5 Productivity

Now we focus on analyzing the change of worker's productivity associated with λ . In essence, productivity is used to measure how many units of output may be obtained from a unit of input. If output per unit of input increases, productivity has risen. If input increases for a given unit of output, productivity has decreased. There

is a whole family of productivity measures which vary depending on the specific data chosen for insertion in the numerator (output) and denominator (input) of the productivity equation (Campbell and Stanley, 1995 p498).

Because effective labour is the focal point of our discussion, we are concerned with labour productivity. Here we measure it by a simple way and assume that it equals dividing total output of on-the-job effective workers by the number of total employment including *xiagang* workers. Assume productivity is denoted by X , then $X \equiv Q/L = f(eL)/L$. Differentiating it with respect to λ , then produces:

$$dX/d\lambda = d[f(eL)/L]/d\lambda = [(LdQ/d\lambda) - (QdL/d\lambda)]/L^2 \quad (15)$$

Combine Eq. (3'), Eq. (13) and Eq. (14') with Eq. (15), then Eq.(15) becomes:

$$dX/d\lambda = f'(eL)N[2e(1-\lambda)de^*/d\lambda + \lambda de/d\lambda + e(1-e)]/N[(1-e)\lambda + e] - f(eL)N[(1-\lambda)de^*/d\lambda + (1-e)] \quad (15')$$

To simplify our analysis, we may break Eq.(15') into two parts. For part one, it consists of 'f'(eL)N[2e(1-\lambda)de^*/d\lambda + \lambda de/d\lambda + e(1-e)]/N[(1-e)\lambda + e]', which reflects the influence of a change of output associated with λ upon productivity. For part two, it consists of '-f(eL)N[(1-\lambda)de^*/d\lambda + (1-e)]', which represents the influence of a change of employment associated with λ upon productivity.

iff $0 < p \leq 1$, i.e., for unskilled workers, according to Eq.(12a), then $de^*/d\lambda > 0$. Thus, part one will be positive, which means that a higher social stability parameter tends to generate higher unskilled workers' output, thus their higher productivity. But part two will be negative, which implies that a higher social stability tends to increase unskilled workers' wages (see Eq.(11)) and employment, and thus to increase labour costs and reduce productivity. Put them together, it will be indeterminate. It may be either positive or negative. This implies that with an increase of λ , productivity of unskilled workers may either rise or decline.

Iff $p > 1$, i.e., for skilled workers, according to Eq. (12b), $de^*/d\lambda < 0$. Thus, either part is indeterminate. Put them together, it is indeterminate too. This implies that with an increase of λ , the change of skilled workers' productivity is indeterminate. It may rise or decline. The reason is that with an increase of λ , skilled workers' wages over *xiagang* worker's, in terms of Eq.(11), definitely rise, but their output and employment may either increase or decrease. As the overall productivity, it will be indeterminate. It may either increase or decrease.

Therefore, with an increase of λ , total worker's productivity including both skilled workers' and unskilled workers' may rise or decline.

4.3.6 Profits

Finally, we may have a look at how a firm's profitability changes with an increase of λ . In terms of Eq.(7), differentiating π with respect to λ , it produces:

$$d\pi/d\lambda = f'(eL)(L de^*/d\lambda + e dL/d\lambda) - Ldw/d\lambda - wdL/d\lambda + \underline{w}dL/d\lambda \quad (16)$$

Substituting $de^*/d\lambda = e'(\lambda) + e'(w-\underline{w})w'(\lambda)$ for $de^*/d\lambda$, Eq.(16) becomes:

$$d\pi/d\lambda = Lf'(eL)e'(\lambda) + Lf'(eL)e'(w-\underline{w})w'(\lambda) + ef'(eL)dL/d\lambda - Ldw/d\lambda - wdL/d\lambda + \underline{w}dL/d\lambda \quad (16')$$

According to Eq.(8), i.e., $f'(eL)e'(w-\underline{w}) = 1$, the part of $Lf'(eL)e'(w-\underline{w})w'(\lambda)$ in Eq.(16') can be simplified and become: $Lw'(\lambda)$. Meanwhile, in terms of Eq.(9), i.e., $ef'(eL) = (w-\underline{w})$, we can simplify the part of $ef'(eL)dL/d\lambda$ into $(w-\underline{w})dL/d\lambda$. Put the two simplified parts back into Eq.(16') to replace their originally complicated ones, then Eq.(16') becomes:

$$d\pi/d\lambda = Le'(\lambda)f'(eL) + Ldw/d\lambda + wdL/d\lambda - \underline{w}dL/d\lambda - Ldw/d\lambda - wdL/d\lambda + \underline{w}dL/d\lambda \\ = Le'(\lambda)f'(eL) \quad (16'')$$

According to Eq.(6), its derivative with respect to λ is that $e'(\lambda) = -1/(1-\lambda)^2$. Put it into (16'') and replaces $e'(\lambda)$, Eq.(16''') then becomes:

$$d\pi/d\lambda = -Lf'(eL)/(1-\lambda)^2 < 0 \quad (16''')$$

Eq.(16''') implies that with an increase of λ , profitability in the state sector will fall, which seems to be consistent with empirical evidence. The literature shows that profitability in SOEs has been continuously deteriorating (Fan, 1998). According to official data, the percentage of loss-making SOEs increased to 51% by the end of June 1996 as reviewed in Section 2.4.3. This prediction is also similar with Lu and Chang's (1998), whose model also predicts falling profitability in the state sector (See Section 3.6).

Two critical questions may be raised: (1) given that the change of either output or productivity is predicted to be indeterminate associated with λ , why it may predict a fall of profitability; (2) why the government is willing to tolerate a fall of profitability in SOEs associated with an increasing λ ?

For the first question, we may refer to Eq.(7) that shows that profits positively relate to output and negatively to total labour costs including *xiagang* workers' wages. With an increase of λ , the change of output is indeterminate and not evident, but real wages of on-the-job workers definitely rise (See Eq.(11)). Furthermore, unskilled worker's employment, as an extremely major proportion of the total employment in the state sector (Cheng and Zhang, 1991),²⁹ definitely increases (see Eq.(13a)) although the change of skilled worker's employment is indeterminate. Hence, the total labour costs increase. Profitability tends to fall.

For the second question, it may be justified by viewing it from the perspective of overall economic developments. The literature suggests that the high cost of maintaining loss-making state enterprises may be justified by the opportunity costs of

²⁹ Cheng and Zhang show that among the employed, people at least with a diploma degree take up only 1.59%, people with high school education take up 9.04%, people with middle school education take up 26.5%, people with only primary school education take up 42.27%. Illiterate persons take up 20.61%.

social unrest and reduction of GDP caused by radical changes (Fan, 1998). In Chapter 2 and 3, we suggest that the Chinese government hold a belief that massive unemployment from the state sector may trigger social unrest and political conflicts that could derail the whole reform process. This means that a partial loss (fall of profitability) is justified by a bigger overall gain (the whole reform process secured). To secure the bigger overall gain, it seems that to maintain social stability by keeping a properly high social stability parameter is necessary.

In addition, while judging the achievements of China's reforms, we can not only focus on the achievement made by SOEs. Instead, the focus should be placed on the achievements of the whole economy including both the state sector and non-state sector. Fan (1998) suggests that the main achievement of two decades of gradual economic reform in China is not obtained from the reform in the state sector, but is from the dynamic development of the non-state sector. While state-owned enterprises are suffering growing financial losses, the non-state sector has grown rapidly and has become a main contributor to the growth and the development of China's emerging market economy. Totally, China achieved the fastest economy growth in the world at an average rate of nearly 10% during the past two decades. This fact may also justify it is sensible and necessary for the government to maintain a properly high social stability parameter in the state sector.

4.4 Summaries

A major contribution of my model is that it introduces a social stability parameter and extends the S-S model to the context of the Chinese labour market. This extension makes us possible to examine the relationships between social stability and an extensive range of variables such as wages, effort levels, employment, output, productivity and profitability. By undertaking a comparative static analysis, my model predicts a series of various but important outcomes with regard to the relationships between social stability parameter and each variable.

It suggests that with an increase of social stability parameter, worker's wages have to be increased large enough to offset its negative influence upon effort levels, and then

to ensure that they will put in their optimal effort. For unskilled workers, their optimal effort levels and employment increase with an increase of social stability parameter, but for skilled workers their optimal effort levels may decline. As a whole, firms' profitability will fall with an increase of social stability parameter.

However, for other variables, it suggests their relationships with social stability parameter are indeterminate. This may be due to that in these cases normally there are two opposite channels that work together. One might make a variable rise with social stability parameter, but another might cause it fall. Therefore, in total, the outcomes become ambiguous.

The implications of my model seem to be consistent with the views of other literature and evidence investigated in chapter 2 and 3. Firstly, it predicts that with an increase of λ , skilled workers tend to move away from the state sector to the non-state sector, but the actual change of their employment in SOEs might be unclear because some institutional restrictions such as *hukou* system may become severer, which reduces their incentives for moving. This is consistent with the mixed evidence examined by the literature of Maurer-Fazio, 1995, Li, 1997, and Yin, 1998.

Secondly, it predicts that unskilled workers will prefer the government's policy of increasing the social stability parameter, thus unskilled workers are more likely to be attracted by SOEs and to enter SOEs. This point is suggested by Dai and Li (1991), and they observe that unskilled workers such as new entrants to work tend to enter SOEs rather than NSOEs.

Thirdly, it suggests that with an increase of the social stability parameter, wages in SOEs tend to rise, but profitability tends to fall. This prediction is consistent with the literature (Fan and Woo, 1993) and our reviews in Section 2.4.3, which show that during the post-reform period, wages in SOEs increased a lot, but profitability in SOEs tended to fall rather than to rise.

Fourthly, my model foresees that unskilled workers would work hard with an increase of the social stability parameter, which seems to be in contrast to the views

of Li (1997). However, it is noticeable that Li's view is held based on the assumption of no punishment for shirking at all. However, since *xiagang* was introduced into SOEs in 1990s, workers are no longer absolutely free from any kind of punishment for their shirking as claimed by Li. Therefore, it is not surprising to see that my conclusion is different from Li's.

Fifthly, this model predicts that with fewer *xiagang* workers (higher λ), wage disparities between on-the-job and *xiagang* workers have to widen since on-the-job workers' wages have to be risen large enough to offset high social stability's negative influences upon worker's effort levels and to ensure they put in effort.

Finally, my model suggests that the impact of an increase of social stability parameter upon the overall worker's productivity in the state sector is indeterminate. This implication seems to be consistent with mixed evidence on actual productivity. Some suggest that the improvement of workers' productivity during the post-reform period was evident (Groves, *et. al.*, 1994), but some claim that the improvement is slow (Fan, 1998, Gordon and Li, 1999). But the prediction of my model contradicts some argument that suggests that the government pursued a policy of balancing the objective of maintaining social stability against that of improving productivity has slowed down the improvement of productivity in SOEs (Lu and Cheng, 1998, Fan, *et. al.*, 1998). For instance, in Section 3.6, we reviewed Lu and Cheng's model (1998) that suggested that limitation to the scale of *xiagang* workers (higher social stability parameter) lowered workers' optimal effort levels and thus reduced their productivity. In terms of my model, their claim for a negative relationship between social stability and productivity may be inaccurate.

According to the implications of my model, we may further make some proposals that may help improve some situations in the Chinese labour market. First, we notice that with an increase of social stability parameter, it does not necessarily result in low productivity, but SOEs have to suffer lower profitability. This suggests that to improve SOEs' profitability, the government may have to manipulate the value of λ and try to reduce it. However, this improvement of profitability is likely to be realized through cutting labour costs at the expense of increasing more *xiagang*

workers rather than through improving workers' productivity. There is a trade-off between social stability and profitability.

Secondly, this model also indicates us that the wage structure in SOEs should be completely reformed. The extremely egalitarian or disguised egalitarian old wage structure (with the wage-plus-bonus-scheme, but bonus tends to be allocated equally) should be abandoned. Wages should better relate to workers' ability and performance. If wages paid to skilled workers are high enough to retain them, they may have less incentive to flow to NSOEs and are willing to put in effort in SOEs. If skilled workers' effort levels are improved, their productivity may increase and the overall productivity may be improved.

Thirdly, this model suggests that with an increase of λ , to induce workers to put in effort wage disparities between on-the-job workers and *xiagang* workers have to be widened. This may be realized through increasing on-the-job workers' wages or reducing *xiagang* workers' wages. Reducing *xiagang* workers' wages may help reduce total labour costs, and thus improve profitability. However, given that the wage levels of *xiagang* workers are already rather low (subsistence levels), this suggestion may be unworkable in reality.

Fourthly, if social security system is extended to NSOEs or a national social security net is implemented, and meanwhile workers are allowed to freely flow between SOEs and NSOEs, then dismissed workers from NSOEs may also obtain an identical subsistence allowance as *xiagang* workers, or find jobs in SOEs. The punishment to shirking workers will then be similar for all workers regardless of which sector they are at. The phenomenon of only skilled workers migrating to NSOEs may disappear. More unskilled workers may flow out from SOEs too. In addition, unskilled workers may have chances to flow from NSOEs into SOEs. This may add new pressures upon incumbent unskilled workers in SOEs. In this case, to induce them to put in identical effort, wages may not be increased so much as before. This may help reduce labour costs, and thus help improve profitability. This kind of reform has actually already been underway in China, but the progress is slow (Fan, *et. al*, 1998).

Finally, it implies that an increase of open unemployment in the non-state sector may improve the overall productivity in SOEs in terms of Eq.(6).

Furthermore, from the perspective of efficiency wage theories, a higher open unemployment rate in the non-state sector may promote workers in NSOEs to put in higher effort.

Chapter 5: Conclusions

In this thesis I reviewed the reform of the Chinese labour market within the past two decades, particularly in the state sector. China has implemented a gradual and piecemeal reform that is in contrast to the big-bang style in East European countries. The reform in China has resulted in a relatively stable society and unprecedented economic growth, whereas reforms in Eastern Europe and the former Soviet Union have been accompanied with continued economic turmoil.

Chinese gradual and piecemeal reforms generate a dual labour sector: the state sector vs. the non-state sector. One important feature of reforms in the state sector is that balancing the objective of maintaining social stability against that of improving productivity is highlighted. This is due to two facts. One the one hand, the government attempts to improve the productivity of SOEs by market means in order to strengthen their competitive ability in a dynamically increasingly competitive environment. On the other hand, it urged to avoid social unrest and political conflicts that could derail the whole reform process.

Xiagang is a distinctive and important reform measure that is introduced into the state sector. This measure highly reflects the trade-off between social stability and productivity improvement. It makes costs available to workers of being shifted to *xiagang* in the state sector, but not as high as to workers of being laid off in the non-state sector. The scale of *xiagang* workers is limited and their subsistence income and welfare are secured. Therefore, *xiagang* as a mechanism to induce workers to put in effort can not be overlooked, but it does not serve as effectively as unemployment in the S-S model.

An important characteristic of this thesis is that the S-S model was extended to include features relevant to the Chinese context including a concern with social stability. An important innovation in my model is the introduction of a social stability parameter that reflects the likelihood of shirking workers being shifted to *xiagang*. By analyzing the relationship between the social stability parameter and

wages, effort levels, employment, output, productivity and profitability, I highlighted some important trade-offs.

My model predicted that with an increase of social stability parameter, wages in SOEs tended to rise, but the profitability tended to fall. More effort might be elicited from risk-averse workers, but risk-neutral workers might have an incentive to move away from SOEs to NSOEs and their effort levels might decline. In addition, in SOEs the employment of risk-averse workers tended to increase. Nevertheless, the changes of risk-neutral workers' employment, the overall output and productivity were indeterminate. These seemed to be consistent with others' literature and evidence.

This model suggested that to improve profitability, the government's stability parameter may be manipulated and reduced to cut labour costs at the expense of more workers being shifted to *xiagang*, but this did not definitely result in productivity improvement. To improve profitability, another possibility was to reform the extremely egalitarian or disguised egalitarian old wage structure, and to ensure that wages related to workers' ability and performance. This required skilled worker's wages to be increased. If the social security system was extended into NSOEs or a national social security net was implemented, the traps and difficulties that SOEs were encountering, such as skilled workers tending to migrate from SOEs into NSOEs, would be reduced. With a rise of open unemployment in NSOEs, the effort levels of workers in SOEs may increase.

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