# Socialist Egalitarianism and the Agency Problem in China's Economic Reform*

**Keun Lee**

*East-West Center*

**Shelley Mark**

*East-West Center*

This paper analyzes empirical consequences of inter-firm egalitarianism in the implementation of the profit retention and bonus payment systems in China's economic reform since 1978. It is shown that due to the emergence of hierarchical collusion among the local state organs, the manager, and the worker, retained profits and bonuses per worker became more or less levelled across firms. As a result, final firm and worker benefits were very weakly related to actual firm performance.

## I. Introduction

China's strong tradition of egalitarianism and resistance to work discipline stands out among the socialist countries.[1] Before the economic reforms in the late 1970s, Chinese state enterprises submitted all of their realized profits to their owner, the state, and there were no material incentives for individual workers in the form of bonuses under the traditional system.[2] With the initiation of economic reform in 1978, the principle of "distribution according to work" has been emphasized to ideologically justify the linking of performance and compensation. First, at the enterprise level, the

---

[1]In China, the bonus system that was patterned after the Soviet practices, was abandoned by workers during the Cultural Revolution. See Walder's article (1987) and book (1986).

[2]This practice contrasts with East European socialist countries where some forms of profit-sharing have developed since the 1950s.

retention of profits by state enterprises was permitted[3]. Then, re-
tained profits are divided into three funds—accumulation, collective
welfare, and workers' bonuses—to stimulate enterprise and worker
incentives.[4]

However, even after a decade's reform effort, there are still frag-
ment reports of Chinese workers' strikes protesting uneven dis-
tribution of bonuses.[5] Implementation of the profit retention system
during the last decade had been hampered by *ad hoc* bargaining
between local tax authorities and enterprises over the determination
of retained profits. Enterprises incurring losses or falling short of
basic quota profits have been bailed out through the "generosity" of
local state organs, enabling the enterprises to pay for bonuses and
collective welfare funds.[6] It appears then that socialist distributio-
nal egalitarianism has run counter to the goal of enterprise reform—
namely stimulating incentives and increasing efficiency. In this pap-
er, we seek to validate this notion by first developing an analytical
framework from a property rights perspective and then testing it
with a sample of Chinese state enterprises.

In the next section, a theoretical framework that enables us to
analyze the causes and the consequences of this egalitarian tendency
in Chinese industries developed. We start with the recognition of an
agency problem in socialism such that medium or low level bureauc-
rats, managers, and workers are not necessarily loyal and know-
ledgeable stewards of the center (or the society) but are subject to
opportunism or a mixture of stewardship and agentship.[7] Then we

---

[3]By the early 1980's, the enterprise-level incentive scheme, which was called industrial
production responsibility system, mainly took two forms: profit retention (*lirun liucheng* )
and profit (or loss) contract (*yingkui baogan* ). In the profit contract system, enterprises
negotiate for annual profit remittance quotas with their supervisory organs, retaining 40
to 100 percent of the above-quota profits. Since then Chinese authorities have con-
tinuously modified their state enterprise system. See Bachman (1987), Fischer (1986), P.
Lee (1985), K. Lee (1989), Lee & Mark (1989), Naughton (1986), Tidrick and Chen, eds.
(1987), and Wong (1986a, b).

[4]By the mid 1980s, incentive pay (bonuses and piece rates) rapidly increased to account
for a substantial portion of workers' total revenues. By 1984, incentive pay was 24
percent of the total wage bill, as compared to only 3.1 percent (Walder 1987, p. 24).

[5]Ignatius and Bennett (1989) mention a case involving 1500 textile workers in Zhejiang
province striking in protest of uneven distribution of bonuses.

[6]See Byrd (1985), Jingji Ribao (July 13, 1988; March 13, 1988), and Shanghai
Wenhuibao (Aug. 16, 1988) for examples of the softening of the budget constraint.

[7]Williamson (1988) observes that "all efforts to organize complex systems over long
periods of time need to come to terms with the cognitive limitations and the motivational
propensities of human agents." As the initial revolutionary passion loses its intensity
over time, the behavioral assumption for human agents of opportunism (as the mixture of
"stewardship" and "agentship") has increasingly become valid in socialism as well.

will argue that two–tier collusion among agents emerged to work against the successful implementation of reform measures. In the upper–tier, collusion between local state authorities and enterprises resulted in a reduction of state shares out of enterprise profits. In the lower–tier, collusion between the managers and the workers resulted in egalitarian bonuses.

The empirical consequences of the dual collusion problem are analyzed in Setion III. With enterprise data over the period 1979–82, we measure the degree of the inter–enterprise egalitarianism such that retained profits per capita and bonuses per capita were more or less equalized across enterprises. It will be shown that per capita retained profits and bonuses are not closely related to firm performance in terms of profitability (profit / capital) and profits per worker. State enetprises thus had weak incentives to enhance their economic efficiency.

## II. Emergence of the Dual Collusion

China's economic reforms introduced a two–tier system of incentive payoffs: i) enterprises were allowed to retain profits after collection of a pre–determined state share; and ii) retained profits were divided into accumulation funds, collective welfare funds, and bonus funds. For purpose of our analysis, we focus on the following three types of financial flows: state–collected profits, retained profits(enterprise funds), and bonus funds. From the worker's point of view, these funds imply different degrees of property rights. Socialism implies that the state is the worker's state and the enterprise is owned by workers. However, the individual worker's property rights over the state budget are almost zero, and his control rights over enterprise funds are quite limited. In contrast, workers have almost full property rights over money received as bonuses. Thus, the degree of "attenuation" of workers' property rights is, in decreasing order, that of the state budget, enterprise funds, and bonus funds. In other words, there exist incentives to reduce the share of the state budget by increasing the enterprise share in profits, and to get as much as possible in the form of bonuses out of retained profit.

It is also important to note that the division of profits into the state budget, accumulation funds, and bonus funds is determined by arbitrary bureaucratic rules. When distribution rules are set by

state organs without objective economic base, distribution of profits results from *ad hoc* bargaining between local state organs and enterprise managers. In this scenario, it is then natural to find that the personal interests of the parties involved dictate the outcome of the bargaining process.

The ambiguity of property rights over the sequential distribution of profits and the corresponding attenuation of individual property rights suggest a high possibility that the state's share would be reduced relative to the enterprise's share, and that enterprise's share would be reduced relative to the individual's share. This possibility is not unlikely since medium or lower level bureaucrats and cadres, managers, and workers are not necessarily loyal stewards for the whole society, but agents with personal interests. An adaptation of the hierarchical principal–agent model (Tirole 1986) can be used to analyze agency problems in China.[8]

Most socialist economies including China have a very hierarchical structure of economic management. Five strata can be identified in China: the central (Party–State) leadership, local state organs, local (or enterprise) party committee, the manager, and the worker (see Figure 1).[9] In the model, the "principal" is the central leadership, and all others are assumed to be "agents" who need to be monitored or given incentives to behave properly. The principal's problem is how to enforce its enterprise reform measures through its intermediate agents (local state or party organs) to the manager and the worker at the bottom; these two agents at the bottom are in charge of production functions.[10] In such a hierarchical principal–agent model, as Tirole (1986) argues, collusion among agents tends to emerge, which interferes with a proper working of the system according to the principal's design.

Given ambiguous property rights relations and with an ineffective monitoring mechanism over agents, the introduction of incentive payoffs tends to transform the "repressed agency problem" into an

---

[8]Tirole's model has a three–tier structure (owner–manager–worker), while the basic principle–agent models, such as those of Grossman and Hart (1983) have only a two–tier (owner–manager) structure.

[9]The Party–State with upper case lettering means the Communist Party–State.

[10]If we see the central party leadership as an agent of the Communist Party representing whole workers, the principal–agents relationships becomes circular, from top to bottom, and from bottom to top. However, since our focus is on (enterprise) reforms and they are initiated by the central leadership, we will ignore this bottom–to–top relationship.
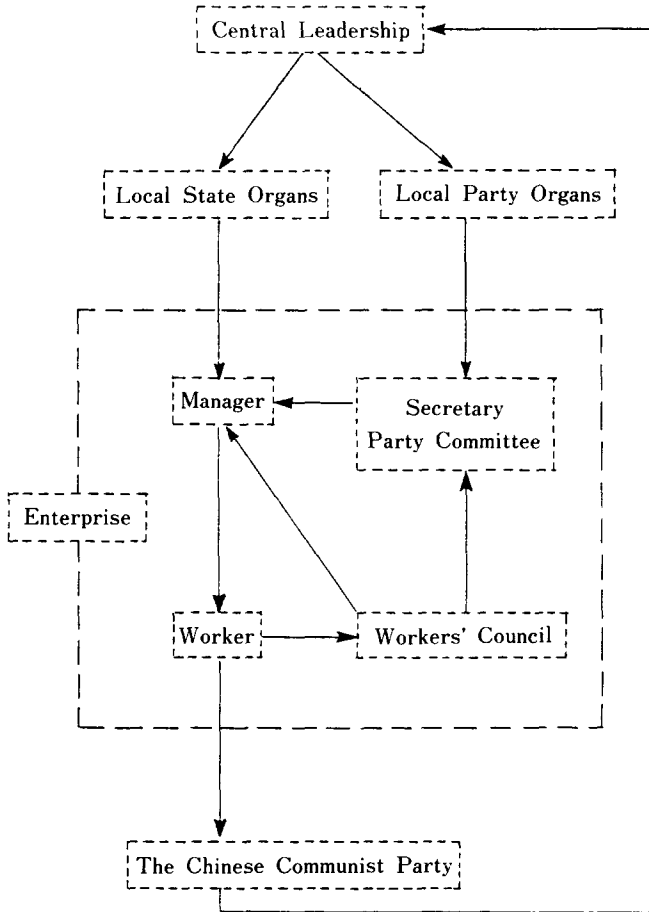
**FIGURE 1**

PRINCIPAL AND AGENTS IN THE CHINESE ECONOMY

"open agency problem." Before the reform, the cost of the agency problem was less effort on the workers' part. With reform, the cost of the agency problem is "open" active pursuit of more profit retention and bonuses without significant increases in productive effort. In China, there emerged two types of collusion. In the upper tier, collusion emerged between the local state organs and the enterprise, and in the lower tier, collusion emerged between the enterprise managers and the workers. The upper tier collusion worked to reduce the share of the state budget by increasing enterprise shares, and the lower-tier collusion worked to reduce the accumulation

funds by increasing worker compensation.

## A) The upper-tier collusion

In the initial stage of the reform effort, the central leadership wished to free the enterprises from the former overtight grip of local state organs. In property rights economics jargon, the reforms allowed enterprises greater "decision management rights," i.e., rights of initiation and implementation of decision-making regarding production plans and marketing, and use of retained profits.[11] Based on state ownership of enterprise assets, the state claimed its "income rights" of receiving a stipulated amount of profit remission from enterprises.[12] Local state organs were in charge of tax collection, and held "decision control" (i.e., monitoring and rectification) rights over the enterprises' decision management.

The initial reform design, however, was not successful. State revenue decreased significantly, and enterprise performance did not improve. One of the main reasons for the failure was the emergence of collusion between agents (local state organs) in charge of decision management. In the Chinese case, local state organs were somewhat resistant to the central initiative and wanted to keep the enterprises under their control. In return, local state organs provided paternalistic protection for the enterprise.[13]

Paternalistic protection results in the softening of the enterprise budget constraint in the forms of "soft subsidies" and "soft taxation" (Kornai 1987, 1986). In the implementation of the profit retention and contract system, many cases were found of losses or low profits short of basic quota profits leading to "generosity" by local state organs, while unexpectedly large profits were subject to irregular exploitation or collection of semi-taxes such as social donations or fees by local state organs.

---

[11]This distinction between decision management and decision control is made in Fama and Jenson (1983). It is argued that control of agency problem requires the separation of decision management and decision control functions among agents.

[12]Pryor (1973) defines property rights to include income rights and control rights. Income rights are the right to use particular goods or services to obtain income other than by means of labor. Control rights, or decision-making rights, are the right to use goods or services with regard to production and exchanges.

[13]The rights of authority at the enterprise level are defined by the ownership of tangible or intangible assets (Holmstrom and Tirole, 1987). Thus, the state is still eligible to claim its authority based on the state ownership of enterprise assets. However, there are other power bases of local state organs, such as supply of raw materials and important inputs.

In other words, local supervisory organs sought to maintain their "discretion governance" over enterprises, rather than serve the central leadership's reform effort. According to Williamson (1989), "discretion governance" leads to lower incentive intensity and greater adaptability than "rules governance." In the Chinese case, incentive intensity was urgently needed, while adaptability of local state organs typically resulted in arbitrary intervention over enterprise matters. In other words, the adaptability was not exercised by enterprises but by local state organs in mainly negative ways. With neither adequate risk-sharing nor "rule governance," the profit retention or contract scheme failed to increase incentive intensity.

An important condition for collusion between local state organs and the enterprises is that the former are not loyal stewards of the central leadership. Local state organs also are not residual claimants who bear value consequences of the enterprises' performance.[14] Nevertheless, there exists no effective control and rewarding mechanism for the central leadership to exercise over local state organs. As a result, the state or the whole Chinese society bears residual risks in the form of reduced budget revenues or lack of improvement in production efficiency.

Another aspect of the collusion is related to "influence costs" which arise due to discretion governance (Milgrom 1988). Because the enterprise is concerned with the decisions that the state organs can make, they tend to spend much time trying to influence the state organs' decisions. Resources and time spent on influence activities are wasteful for the economy. Kornai's soft budget constraint situation results in a higher incidence of these influence costs.[15]

## B) *The lower-tier collusion*

Since 1978, the "plant-director responsibility system under the leadership of the Party committee" was revived on the ground of the necessary internal division of labor in the enterprises.[16] It was

---

[14]In property rights economics, residual claimants are those who contract for the rights to net income flows and bear the residual risk—the risk of the difference between stochastic inflow of income and promised income payments to each agents (Fama and Jenson, op cit).

[15]This time is valuable; if it were not wasted on influence activities, it could be used for directly productive activities or simply consumed as leisure (Milgrom 1988, p. 43).

[16]Since 1952 the enterprise leadership system in China has evolved with several models and stages: i) the "Soviet-type" one-director system during the 1953-56 first five-year plan period; ii) the plant-director responsibility system under the leadership of

argued that the enterprises must respond to two separate impulses — the law of markets as well as the needs of the state—with the manager and the Party committee handling each of the two impulses, respectively (Chamberlain 1987, p. 636).[17]

To further promote collective leadership in the enterprise, the Workers Congress was reinstituted in 1978. The powers of the post-1978 Congress were broader and more clearly defined than those of its predecessors, and included the ratification and monitoring of enterprise plans, budgets, and contracts, the election and recall of junior and senior cadres including managers.[18] The election of the managers by the Workers Congress was supposed to be prearranged by supervisory state organs, but in most cases, the mangers of the state-owned enterprises were directly appointed by their supervisory state organs (Hong and Lansbury 1987). To the extent that the collective leadership is well exercised, the manager would have found it necessary to seek legitimation of his role and position from both Party committee and the Workers' Congress. Consent from the work force would provide the mandate for the manager's leadership position (ibid).

However, the principle of collective leadership was soon abandoned and replaced by one-man control by the Party secretary.[19] As decentralization and marketization created a new economic environment, management run by the Party (and especially the Party secretary) proved incapable of achieving the goal of higher economic efficiency. Political cadres did not have qualified management know-

the Party committee before the Cultural Revolution period; iii) the collective management by the "Revolutionary committee" during the Cultural Revolution period; iv) restoration of the plant-director responsibility system under the leadership of the Party committee after the "smashing of the gang of four" in 1976; and v) the plant-director (manager) responsibility system since 1984 to present. On the evolution of the enterprise leadership system, see Zheng (1987) and Chamberlain (1987).

[17]Originally, the "plant-director responsibility system under the leadership of the Party committee" was introduced by chairman Mao as a re-assertion of political control over the economic bureaucracy during the Great Leap Forward. With this system, the dogmatic copying of the Soviet model of the enterprise leadership was criticized.

[18]For details about earlier systems, see Morris (1985).

[19]This was mainly because committee members were simply too overburdened to practice collective leadership. A lot of issues coming within the committee's purview were actually of such nature as should have been handled by administrative organs. As Chamberlain argues, "A major consequence of this overload on the Party committee was that power once again gravitated into the hands of one person, the Party secretary. The latter was expected to have an opinion on every issue, to make known his preference—in effect, make the final decisions." (p. 639)

ledge, while managers did not have appropriate decision–making powers to carry out their duties successfully. Even though the manager's duties have increased since the reforms, their powers did not correspondingly increase. The manager had to deal with diverse, sometimes conflicting, demands from the supervisory state organs, the Party committee, and the Workers Congress.

Such leadership system in the initial model can be seen as a structure with one agent (manager) and multiple supervisors, the enterprise Party committee and secretary, local state organs, and possibly the Workers Congress. Efficient management can hardly be expected of the manager in such an environment. Furthermore, the manager had no effective disciplinary control over the worker. In this situation, the tendency is for collusion with the worker.

Walder (1987) observes that a tacit agreement emerged between managers and workers, with both parties seeking to retain as much money as possible in the worker's fund, while distributing it as equally as possible. He argues that despite the large pay increases there was an upsurge of contention, even open conflict, over wage and bonus matters due to the lack of consensus over fair quotas and related payments. Manangers side-stepped this potential problem by paying out bonuses equally, and accommodated workers' demands regarding the use of retained profits for bonuses and housing construction. In return, the manager could expect worker's cooperation and stability in production. Behind such collusion between the manager and workers lies the workers' cultural and political orientation toward egalitarianism which has been found to effectively resist payment–by–results schemes (Fischer 1986, p. 563; Byrd and Tidrick 1987, pp. 73-4). In results, the link between bonus payments and work performance was weak and subject to negotiation, and a minimum level of bonus equivalent to at least two months of basic wages was virtually incorporated into the basic wage (Tidrick and Chen 1987, p. 184).

## III. Models and Results

In this section, we will analyze the empirical consequences of the dual collusion problem in China's reform. Our investigaion of data of 20 firms as originally published in Tidrick and Chen (1987) shows that average enterprise profits decreased by an average annual rate of 3.1 percent over the period 1979-82 (Table 1). In contrast, enter-

TABLE 1

IMPACTS OF INITIAL ECONOMIC REFORM IN 20 INDUSTRIAL ENTERPRISES, 1979-82

| | Units | 1979 | 1982 | Annual Growth |
|---|---|---|---|---|
| (A) | | | | |
| Profits | 1,000 Yuan | 126,640.9 | 115,358.8 | −3.1% |
| Remissions (tax) | 1,000 Yuan | 123,543.6 | 99,282.1 | −7.0% |
| Average retention ratio | % | 12.2% | 18.9% | 15.7% |
| Retained profits* | 1,000 Yuan | 2,414.4 | 6,190.7 | 36.9% |
| Bonuses | 1,000 Yuan | 2,593.6 | 3,953.9 | 15.1% |
| Total wage bill | 1,000 Yuan | 18,593.1 | 20,952.2 | 4.1% |
| Non-bonus wage sum | 1,000 Yuan | 15,999.5 | 16,998.3 | 2.0% |
| (B) | | | | |
| Profit per worker | Yuan | 4,105.4 | 4,042.3 | −0.5% |
| Remission per worker | Yuan | 3,759.5 | 3,477.2 | −2.6% |
| Retained profits per worker* | Yuan | 361.1 | 539.7 | 14.3% |
| Bonus per worker | Yuan | 129.2 | 184.7 | 12.7% |
| Wage bill per worker | Yuan | 811.7 | 897.1 | 3.4% |
| Profitability | (profit / capital) | 0.81 | 0.57 | −11.1% |

Sources: Calculations are based on 20 enterprise data published in Tidrick and Chen (1987, pp. 11–38). 1979 and 1982 figures are average values of 20 enterprises. However, annual growth figures are not averages of annual growth obtained by each of the 20 firms, but from direct comparison of 1979 and 1982 average figures.

Note: • Retained profits (per worker) figures exclude Anshan corporation data. With this ultra-large firm's data included, 1979 and 1982 average retained profits figures, and growth figures are 3097.3, 16076.7, and 73.1 percent (this firm's retention figures alone are greater than half of the sum of other 19 firms), and retained profit per worker figures are 345.9, 565.1, and 17.8 percent, respectively.

prise retained profits increased by 36.9 percent, while remission of the profits to the state decreased by 7.0 percent.[20] Bonus funds also increased, with a 15.1 percent annual average growth rate. In section (B) of Table 1, it is clear that though profit per worker and profitability decreased slightly, per capita retained profits and bonuses increased substantially. These figures seem to suggest that incentive payoffs such as profit retention and bonuses had no close link with changes in enterprise performance as measured by

[20]For the annual growth of retained profits, 36.9 percent, we omitted Anshan corporation data. With this firm data included, the annual growth rate is 73.1 percent. In other words, this ultra-large firm heavily affects the outcomes of the calculation. See note in Table 1 for a related discussion.

profitability.[21] This suggestion is subjected to more rigorous veri-
fication by regression models below.

The idea behind the profit retention scheme was that enterprises
that retain more profits will have a greater incentive to produce
even more profits. However, the actual practices seemed to be such
that profit retentions have no relationship with the actual profits
produced by the enterprises. In this regard, we suggest that profits
were distributed in such a way that retained profits per capita were
more or less equalized across enterprises regardless of their actual
profitability. This suggestion is supported by the high incidence of
cases where enterprises with poor profit performance received
favorable treatment, while enterprises with unexpectedly good profit
performance were subject to irregular confiscation of the extra pro-
fits. Since the biggest portion of the retained profits was used to
finance the bonus funds and collective welfare funds, it may be
reasoned that the stronger the egalitarian tendency, the more pro-
portional retained profits would be to the number of workers in a
firm.

Consider the following equation,

$$\frac{RP}{L} = \frac{RP}{PP} \ \frac{PP}{K} \ \frac{K}{L}$$

$$= r \ \cdot \ (pk)^1 \ \cdot \ (lk)^{-1}$$

(1)

where

$RP$ = retained profits
$L$  = labor (number of workers)
$PP$ = profits
$K$  = capital (value of net assets)
$r$  = retention ratio (= retained profits / profits)
$pk$ = profitability (= profits / capital)
$lk$ = labor intensity (= labor / capital)

Equation (1) implies that if retained profits per capita are per-
fectly equalized across firms at the fixed level, i.e., $RP / L = C$,
then in each firm the profit retention ratio should be determined by
the following formula:

$$r = C \cdot (pk)^{-1} \ \cdot \ (lk)^1$$

(2)

[21]The national data of 1978–89 also show similar trends in these figures.

Equation (2) implies that a one percent increase in labor intensity leads to a one percent increase in the profit retention ratio, while a one percent increase in profitability leads to a one percent decrease in the profit retention ratio. This is the case of perfect equalization of retained profit per capita. The more general case of imperfect equalization can be developed as:

$$r = C \cdot (pk)^{\alpha-1} \cdot (lk)^{1+\beta} \tag{3}$$

Substituting (3) for $r$ in (1) gives

$$RP / L = C \cdot (pk)^{\alpha} \cdot (lk)^{\beta} \tag{4}$$

Equation (4) defines retained profits per capita as a function of a constant level of retained profits per capita and two modifying factors of profitability and labor–capital ratio. The parameter $\alpha$ measures the sensitivity of the level of retained profits to the level of profitability. The parameter $\beta$ measures the degree of egalitarianism. Perfect egalitarianism occurs when $\beta = 0$ and will results in perfect equalization of per capita retained profits at the level $C$, provided $\alpha$ is also 0. If $\beta$ is less than 0, there is imperfect egalitarianism and, given the same level of profitability, more labor-intensive firms will end up with lower levels of retained profits per capita. The actual estimated results suggest that imperfect egalitarianism prevails. The case of $\beta$ bigger than 0 relfects excessive egalitarianism but this rarely occurs.

A similar analysis can be used to verify the hypothesis of the egalitarian bonuses, i.e., per capita bonuses that are equalized across firms. Consider the following equation.

$$\frac{B}{L} = \frac{B}{RP} \frac{RP}{PP} \frac{PP}{L}$$
$$= br \cdot (r)^1 \cdot (pl)^1 \tag{5}$$

where

   $B$  = bonus funds
   $br$ = ratio of bonus funds to retained profits ($= B / RP$)
   $pl$ = labor profitablity or per capita profits ($= PP / L$)

Equation (5) implies that if bonuses per capita are perfectly equalized across firms at the fixed level, i.e., $B / L = D$, then the ratio of bonus funds to retained profits should be determined by the following formula in each firm:

$$br = D \cdot (pl)^{-1} \cdot (r)^{-1} \tag{6}$$

Equation (6) is valid only for the case of perfect equalization of per capita bonuses. In the case of imperfect equalization, the equation becomes:

$$br = D \cdot (pl)^{\gamma-1} \cdot (r)^{\delta-1} \tag{7}$$

Substituting (7) for *br* and (3) for *r* in equation (5), we transform equation (5) into

$$B / L = C^{\delta} \cdot D \cdot (pl)^{\gamma} \cdot (pk)^{\delta(\alpha-1)} \cdot (lk)^{\delta(1+\beta)} \tag{8}$$

Equation (8) defines per capita bonuses as a function of a constant minimum retained profits per capita (*C*), a constant minimum bonuses per capita (*D*), labor profitability (*pl*), capital profitability (*pk*), and labor–capital ratio (*lk*). Exponent parameters represent the sensitivity of per capital bonuses to these variables. In the case of perfect equalization where $\gamma = \delta = 0$ in equation (8), no variables affect the level of per capita bonuses, and it is determined at the constant minimum level, i.e., $RP / L = D$.

The regression results of a logarithmic transformation of equation (3) is given in Table 2. In the first set of regressions, enterprise data for each year (1979, 1980, 1981 and 1982) were run. Data for 1979 and 1980 were then merged into a data set called, the first stage, and data for 1981 and 1982 were merged into another data set, the second stage. The first stage refers to the initial introduction of the profit retention system, while during the second stage the profit contract system was implemented. Finally, all the data from 1979 to 1982 were merged into the panel data, and regressions using this panel data were used to check the stability of the results obtained for each year.[22]

The results based on the panel data are given in row (A) in Table 2. The results indicate imperfect equalization such that a one percent increase in profitability leads to 0.64 percent decrease in the profit retention ratio, while a one percent increase in labor intensity leads to 0.75 percent increase in the retention ratio. The basic, constant level of the per capita retained profits is 319.8 Yuan, which amounts to 62.4 percent of the average per capita retained profits over the 4 years.[23] Considering that 1—(profit retention

[22]Here, we discuss only the results by the panel data and two stage data. Results by annual data are consistent with, and confirm, results using these data.

[23]319.8 Yuan is obtained by taking the antilog of −1.14 and then multiplying by 1,000

TABLE 2
EQUALIZATION OF PER CAPITA RETAINED PROFITS REGRESSION RESULTS

| Dependent Variables | Parameters | | | $R^2$ | F-value |
|---|---|---|---|---|---|
| | ln $C$ | $\alpha - 1$ | $1 + \beta$ | | |
| (A) 1979-82 $r$ | −1.14 | −0.64 | 0.75 | 0.31 | 18.2* |
| | (−4.9)* | (−5.3)* | (5.7)* | | |
| (B) 1979-80 $r$ | −1.13 | −0.69 | 0.90 | 0.34 | 10.7* |
| | (−3.2)* | (−3.9)* | (4.3)* | | |
| (C) 1981-82 $r$ | −1.07 | −0.58 | 0.68 | 0.27 | 7.8* |
| | (−3.5)* | (−3.5)* | (3.7)* | | |

Note: 1. $r$: profit retention ratio.
2. Numbers are estimated coefficients with $t$-values in parentheses.
3. *: significant at 1%.
4. +: significant at 5%.

ratio $r$) is the profit tax rate, the results show a very progressive and egalitarian tax structure. It is progressive since the more profitable a firm is, the higher tax rate the firm is subject to. It is egalitarian since more labor intensive firms are subject to lower tax rates. This situation is exactly the opposite of the original intention of the profit retention scheme. We can reason that such practice will not be successful in enhancing economic efficiency and performance of firms.

Rows (B) and (C) are the regression results for the first and the second stages. These regression results are basically consistent with that in row (A) based on the data of all the four years. One important phenomenon noticeable over the two stages is that the explanatory power of the profitability variable increases, while that of the labor intensity variable decreases. The estimated coefficient of the labor intensity variable decreased from 0.90 in the first stage to 0.68 in the second stage, while that of the profitability variable increased from −0.69 to −0.58. This trend suggests that the profit taxation becomes less egalitarian and less progressive over the period. In other words, it implies that the implementation of the profit retention system was, slightly improved, so that enterprises may have increasing incentives to increase their economic efficiency.

Yuan which is the unit used for profit figures.

TABLE 3
EGALITARIAN BONUS. REGRESSION ANALYSIS

| Dependent Variables | Parameters | | | | |
|---|---|---|---|---|---|
| | $\ln D$ | $\gamma - 1$ | $\delta - 1$ | $R^2$ | $F$-value |
| (A) 1979-82 $br$ | 4.32 | −0.87 | −0.87 | 0.89 | 313.4* |
| | (11.1)* | (−16.3)* | (−19.6)* | | |
| (B) 1979-80 $br$ | 4.48 | −0.92 | −0.92 | 0.88 | 143.0* |
| | (8.7)* | (−12.9)* | (−16.5)* | | |
| (C) 1981-82 $br$ | 4.37 | −0.86 | −0.86 | 0.82 | 84.9* |
| | (7.7)* | (−11.2)* | (−11.8)* | | |

| Year | 1979 | 1980 | 1981 | 1982 | Average |
|---|---|---|---|---|---|
| Average bonus | 129.2 | 169.9 | 194.4 | 184.7 | 169.0 |
| Coeff. of variation | 26.4 | 25.4 | 36.4 | 28.4 | |

Note: 1. $br$: ratio of bonus funds to retained profits.
2. Numbers are estimated coefficients with $t$-values in parentheses.
3. *: significant at 1%.
4. +: significant at 5%.

It also implies that the Chinese gradually allowed more inter-firm variation in retained profits per capita.

Table 3 presents estimates of a logarithmic transformation of equation (7), defining the determinants of the ratio of bonuses to retained profits. The results in row (A) which used the panel data of all the four years show the parameters to be very close to minus 1, which would be the case of perfect equalization. The constant, basic level of bonuses, $D$, is estimated as 87.4 Yuan per worker. The hypothesis that the estimated parameters, $(\gamma - 1)$ and $(\delta - 1)$, are −1 is accepted at the 5 percent significant level (one-tail tests) for the results in row (B) using the data of the first two years, 1979-80. The same hypothesis is rejected for the years 1981-82. This fact implies that the equalization tendency had become weakened over the reform period.

With parameter estimates from above, together with $C$ and $D$, we can write the equation (8) as:

$$B/L = (319.8)^{0.13} \cdot (87.4) \cdot (pl)^{0.13} \cdot (pk)^{0.08} \cdot (lk)^{0.10} \qquad (8a)$$

$$= (185.0) \cdot (pl)^{0.13} \cdot (pk)^{0.08} \cdot (lk)^{0.10} \qquad (8b)$$

TABLE 4

ECONOMIC EFFICIENCY AND GROWTH

| | Average Gross Labor Productivity | | Average Gross Capital Productivity | | Comparison of Growth Rates | | |
|---|---|---|---|---|---|---|---|
| Period | Means | Growth Rates | Means | Growth Rates | Employment | Capital | Gross Output |
| 1976–78 | 17.3 | 17% | 3.8 | 12% | 5.4% | 11.1% | 23.2% |
| 1978–80 | 21.2 | 12% | 5.1 | 16% | 8.6% | 4.7% | 21.3% |
| 1980–82 | 21.7 | 0% | 4.1 | −9% | 9.1% | 22.3% | 8.2% |

Notes: 1. gross labor productivity = constant value of gross output / workers.
2. gross capital productivity = constant value of gross output / value.

The resulting equation (8b) implies that due to the double tendency of the equalization of the per capita retained profits and per capita bonuses, the sensitivity of the per capita bonus to labor and capital profitabilities ($pl$ and $pk$)is minimal. It shows that enterprise workers are guaranteed at least an average level of per capita bonuses, regardless of enterprise performance; note that the fixed level of per capita bonuses, 185 Yuan, is almost 100 percent of average per capita bonuses in 1982.

In terms of economic efficiency, introduction of material incentives in Chinese industrial reform through the profit retention system and bonus payments did not significantly improve economic efficiency in state enterprise, as results above imply. Table 4 shows the trends in labor productivity and capital productivity from the pre-reform to the reform periods in our sample enterprises. Although gross productivity increased with initiation of reform in 1979 and 1980, it did not rise significantly from the pre-reform period. In fact, gross productivity of labor and capital decreased or stood still over the second period of reform, 1980–82.[24] However, employment increased remarkably since the reform. Our regression results show that these workers were guaranteed their share of retained profits, and hence bonuses. In sum, it appears that any incentive effects of the initial reform measures would have been exhausted without further stimulation, such as from enhanced market competition or

[24]The 9 percent decrease of capital productivity during 1980–82 may be overestimated when we consider recent inflation of capital prices. However, the weight of this factor depends on the share of newly-added capital out of total accumulated capital, which might be small for large and medium-sized state enterprises. However, though our data cover only 20 enterprises up to 1982, there is evidence that Chinese large and medium-sized industrial enterprises have not performed well at least up to 1985. See Lee (1989a).

hardening of the enterprise budget constraint.

## IV. Conclusion

In sum, the main findings of this regression analysis are as follows: First, higher profitability is associated with a low retention ratio so that the link between the reported and retained profitability is weak. This implies that firms have weak incentives to increase their profitability. Second, the labor intensive firms are more successful in negotiating with state authorities for favorable treatment in the profit remission. The combination of these two features explains the tendency of profit–share equalization whereby the retained profits per worker become more or less levelled across firms with the same profitability. Third, given the lack of data for individual bonus payments, the analysis shows that per capita bonuses in firms have a very weak relationship with firm performance measures such as labor and capital profitability, but are more or less fixed in amount. This verifies the existence of the inter–enterprise egalitarianism in Chinese bonus payments. However, generalization of the results requires more work with a larger and more recent data set.

The dual–hierarchical collusions among local state organs, the managers, and the workers underlie the deficiencies of two–tiered incentive systems in China. However, continued experimentation in enterprise reform has taken place. Elsewhere, we trace the evolution of these efforts—the tax-for-profit system (1983–85) which followed the profit retention and contract system, the contracted management system (since 1986), and the recent emergence of the shareholding system. In each case, we show, as in our present discourse, that the ambiguity in property rights relations encourages collusive behavior among agents which precludes attainment of enterprise efficiency goals.[25] While the recent high inflation and rampant official corruption is believed to have dampened morale of Chinese workers, the fact that neither moral nor material incentives seem to be working would appear to be of even more fundamental concern in assessing the country's economic future.

---

[25]See Lee and Mark (1989) and Lee (1989b).

# References

Bachman, David M. "Implementing Chinese Tax Policy." In David M. Lampton (eds.), *Policy Implementation in Post–Mao China*. Berkeley: Univ. of California, 1987.

Byrd, William. "China's Non-ferrous Metals Industry: Reforms and Recent Development in the Shenyang Smeltery." World Bank Staff Working Papers No. 766. Washington, D. C.: World Bank, 1985.

Byrd, William, and Tidrick, Gene. "Factor Allocations and Enterprise Incentives." In Gene Tidrick and Chen Jiyuan (eds.), *China's Industrial Reforms*. New York: Oxford University Press (for the World Bank), 1987.

Chamberlain, Heath B. "Party-Management Relations in Chinese Industries: Some Political Dimensions of Economic Reform." *China Quarterly* No. 112 (1987):631—701.

Fama, Eugene, and Jenson, Michael. "Separation of Ownership and Control." *Journal of Law and Economics* 26 (1983):301-26.

Fischer, William A. "Chinese Industrial Management." In *China's Economy Looks Toward the Year 2000* Vol. 1. Comp. of Papers, Joint Econ. Comm., U. S. Congress. Washington, D. C.: U. S. Govt. Printing Office, 1986.

Grossman, Sanford, and Hart, Oliver. "An Analysis of the Principal–Agent Problem." *Econometrica* 51 (January 1983):7-45.

Holmstrom, Bengt R., and Tirole, Jean. "The Theory of the Firm." In R. Schmalensee and R. Willig (eds.), *Handbook of Industrial Organization 1987*, forthcoming.

Hong, Ng Sek, and Lansbury, Russell D. "The Workers' Congress in Chinese Enterprises." In M. Warner (eds.), *Management Reforms in China*. London: Frances Pinter, 1987.

Ignatius, Adi, and Bennett, Amanda. "China's Economic Woes Post Risk of New Unrest." *The Asian Wall Street Journal Weekly*, Aug. 7, 1989.

Jiang, Yiwei, etc. "On Systems of Socialist Enterprise Leadership with Chinese Characteristics." *Jingji Guanli* No. 12 (December 1985),translated in Joint Publication Research Service (JPRS)-CEA-86-024. March 12, 1986.

Jingji Ribao. "Caizhengbuchang Wangbingqian zaishuiwugongzuo huishang zhichu (Minister of Finance, Wang, pointed out at the meeting about taxation services)." July 13, 1988.

_____. "Chengbao yao jiangu guojia he qiye liangtou buneng baoying bubaokui (contract system shoud take care of both ends of state and enterprises so as not to contract profits but not losses)." March 13, 1988.

Kornai, Janos. "The Dual Dependence of State Owned Firm in Hungary." In Gene Tidrick and Chen Jiyuan (eds.), *China's Industrial Reforms*. New York: Oxford University Press (for the World Bank), 1987.

_____. "The Soft Budget Constraint." *Kyklos* 39 (No. 1 1986): 3-30.

Lee, Keun. "The Chinese Model of the Socialist Enterprise: An Assessment of its Organization and Performance." *Journal of Comparative Economics* (1989), forthcoming. (a)

_____. "Property Rights and Agency Problem in China's Enterprise Reform, 1979-1989." *mimeo*, 1989. (b)

Lee, Keun, and Shelley Mark, "Property Rights Economics and the Shareholding Corporation in China." *mimeo*, 1989.

Lee, Peter N. "Enterprise Autonomy Policy in Post-Mao China: A Case Study of Policy Making, 1978-83." *China Quarterly* (March 1986):45-71.

Milgrom, Paul R. "Employment Contracts, Influence Activities, and Efficient Organization Design." *Journal of Political Economy* 96 (No. 1 1988):42-60.

Morris, Richard. "Trade Unions in Contemporary China." *The Australian Journal of Chinese Affairs* (January 1985):51-67.

Naughton, Barry. "Finance and Planning Reforms in Industry." In *China's Economy Looks Toward the Year 2000* Vol. 1. Comp. of Papers, Joint Econ. Comm., U. S. Congress. Washington, D. C.: U. S. Govt. Printing Office, 1986.

Pryor, Frederic L. *Property and Industrial Organization in Communist and Capitalist Nations.* Indiana Univ. Press, 1973.

Shanghai Wenhuibao. "Tantao qiye chengbaozhi changduan libi (discussions about long and short sides of contract management system)." Aug. 16, 1988.

Tidrick, Gene, and Chen, Jiyuan, eds. *China's Industrial Reforms.* New York: Oxford University Press (for the World Bank), 1987.

Tirole, Jean. "Hierarchies and Bureaucracies: On the Role of Collusion in Organization." *Journal of Law, Economics, and Organization* 2 (Fall 1986): 181-214.

Walder, Andrew. "Wage Reform and the Web of Factory Interests." *China Quarterly* (March 1987):22-41.

_____. *Communist Neotraditionalism.* Berkeley: Univ. of California Press. 1986.