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Industrial reforms in China: State-owned enterprises between output growth and profitability decline

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**INDUSTRIAL REFORMS IN CHINA:
State-Owned Enterprises Between
Output Growth and Profitability Decline**

by

Martin Raiser

January 1995



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I. Introduction

China has recorded extraordinary growth rates since the beginning of its market oriented reforms in 1978. While reforms began in the agricultural sector, the industrial sector has been at the core of reform efforts since 1983. As early as 1978, the share of industry in China's GDP was exceptionally high at 38.4 per cent (1987 prices), compared for instance with only 23 per cent in India. At the same time, the Maoist industrialisation drive was widely blamed for an overemphasis on heavy industry, an extensive growth path that took no account of relative scarcities and a resulting stagnant or even negative total factor productivity growth (World Bank, 1985; Tidrick, 1986; Dernberger, 1988). In 1991, after almost a decade of industrial reforms, China's industrial sector had grown to 48 per cent of GDP. Indeed, gross real output growth averaged 13 per cent per annum from 1978-1992. Thus, inspite of a seemingly distorted economic structure, China has so far been able to avoid the dramatic output decline characteristic of industrial reforms in almost all other emerging market economies (EMEs), particularly in Central and Eastern Europe (e.g. Bruno, 1992).

One feature of industrial performance that China shares with the European EMEs is the decline in the profitability of state-owned enterprises (SOEs) (McKinnon, 1991). While the average profitability (gross profit over gross value of output) of Chinese industry has declined overall, falling profits (and recently, growing losses), in SOEs have particularly serious consequences for the rest of the economy. First, as tax revenue in socialist economies relied almost exclusively on transfers from SOEs, transition economies face a dramatic erosion in their tax base. Second, as the institutional regulations needed to provide for the smooth exit of loss-making public enterprises from the market are missing, an increasing share of loss-makers among SOEs increases the burden of subsidisation for their legal owners, namely the central or provincial governments. Third, as SOEs usually fulfil a number of social obligations in addition to their productive activities, closing loss-making SOEs may cause social disruption and endanger the entire reform process. Although the share of SOEs in industrial employment in China has always been less than in Central and Eastern Europe, by the early 1990s it was still around 45 per cent. Moreover, by

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1993 over 30 per cent of SOEs were estimated as making losses and, by the first half of 1994 this estimate rose to 48 per cent (Perkins and Raiser, 1994).

Corresponding to falling profits in SOEs, China has begun to share many of the problems of subsidisation of loss-makers evident in other EMEs, namely rising budget deficits, non-performing bank loans and rising inter-enterprise debt chains. From 1987 to 1993 the consolidated budget deficit (including policy loans from the Peoples Bank of China) increased from 3-4 per cent of GDP to 7-9 per cent of GDP (World Bank, 1994b, p. 26). The puzzle thus arises how China is able to record high industrial output growth (even in SOEs the gross value of output increased by a yearly average of 8 per cent since 1978) while an increasing proportion of its SOEs are loss-making. Is the fall in industrial profitability an inevitable and to a certain extent welcome development as it reflects increasing competition on Chinese markets (Jefferson and Rawski, 1994; Zheng, 1994)? Or does it reflect increasing allocative inefficiencies in Chinese firms and indicates that the limits to an extensive growth path are becoming evident in China (Chai, 1994; IMF, 1993; Woo et al., 1994)?

This paper aims to clarify the questions raised above. The focus on SOEs allows to test some hypotheses concerning the behaviour of firms subject to soft budget constraints (Kornai, 1986; 1993; Raiser, 1993). In particular, should SOEs in China be characterised by persistent allocative inefficiencies in the course of reforms, the decline in profitability in the state sector would be symptomatic for delayed adjustments. In consequence, without far reaching institutional reforms at the micro-economic level, the sustainability of macro-economic stability might be jeopardised by the growing burden of subsidisation of inefficient SOEs. Such a line of argument would also find support with mounting evidence for statistical fraud by SOE managers (Rawski, 1993; Lingle and Wickman, 1994) and conclude that China's world record growth rates might well have to be taken with a considerable grain of salt.¹

Conversely, if SOEs had improved their allocative efficiency since 1983 and total factor productivity growth was positive during the 1980s and 1990s, China's gradual and experimental reform strategy in the industrial sector might well have paid off (Jefferson and Rawski, 1992; 1994; McMillan and Naughton, 1992; Naughton, 1993). Falling profitability in SOEs might be attributed to increasing competition from China's emerging non-state sector and the dispro-

¹ By implication, this hypothesis would expect enterprises with private property rights and harder budget constraints, such as the township and village enterprises, to grow more rapidly and display higher allocative efficiency than SOEs. Indeed, already the dynamic township and village enterprises (TVEs) account for a rising proportion of industrial output growth (Sachs and Woo, 1994).

tection of the SOE capital stock in the course of price and trade liberalisation. Additionally, the implication of generally market oriented behaviour in the majority of SOEs would enhance the scope for sustainable indirect macro-economic management without the urgent need for micro-economic reforms.

The following section gives a brief overview over industrial reforms in China since 1983 and surveys some of the literature on industrial performance. The next two sections turn to the behaviour of SOEs on the basis of micro-economic survey data from four coastal cities in China. Specifically, the third section attempts to measure allocative inefficiency in SOEs as the deviation of labour shares from production elasticities of labour. Section IV looks at other determinants of profitability. The fifth section summarises the evidence and derives policy conclusions.

II. Industrial Reforms and State-Owned Enterprise Performance in China in Retrospect

Industrial reforms in China commenced in 1983, following limited experiments with enterprise taxation and increased autonomy in output and investment decisions during the early 1980s.² From 1984, the two-tier pricing system allowed SOEs to sell a growing share of their output on the free market and to buy additional inputs at free market prices. Investment decisions were also decentralised and a commercial banking system introduced in 1984. After uniform income taxation had replaced direct profit transfers to the budget in 1984, the contract responsibility system, introduced in 1986, returned to a more discretionary form of taxation. Financial relationships between the supervisory authorities and SOEs were now formalised in terms of agreed ex ante input and output quotas to be bought and sold at official prices in return for a profit delivery quota also fixed in advance. Finally, workers benefited from the reintroduction of bonuses linked to enterprise profitability and some flexibility was allowed in employment relations through the introduction of temporary work contracts (see also Groves et al., 1994; Hay et al., 1994).

The pace of reform was relatively rapid up until the macro-economic crisis of 1988-89 which was followed by a period of retrenchment. Particularly, price controls were reestablished and investment autonomy curtailed. Moreover, the phase of macro-economic austerity lasting until 1991 revealed that loss-making SOEs were effectively shielded from bankruptcy in the event of insolvency. Massive financial injections and government interventions in credit allocation prevented an industrial shake-out in the public sector during that period, while

² For a review of industrial reforms see Hussain (1990), Bell and Kochhar (1992) and IMF (1993).

at the same time failures were numerous among the township and village enterprises and in the growing private sector (Li, 1991). Since 1992 a new wave of reforms has focused on corporate governance issues in SOEs. The Regulations on Changing the Operating Mechanism of Enterprise issued in that year were to guide the implementation of the bankruptcy law which was legally effective since 1988. In return, the autonomy of SOEs in issues relating to current operations was greatly increased and first steps towards the commercialisation of the industrial sector were taken. This reform agenda culminated in the reform proposals of November 1993 which allow for the trade in SOEs' assets and introduce shareholder liability for all firms, including loss-makers (see also World Bank, 1994b).

Today most SOEs largely operate in a market environment with respect to the prices they pay for material inputs and receive for their output, although price controls are still in existence in some crucial areas such as energy and the use of public utilities. A uniform corporate income tax rate of 33 per cent in principle applies to all firms, after which remaining profit may be retained, but discretionary exemptions from tax obligations are widespread. Significant government restrictions still apply with respect to access to imports and the use of foreign exchange earnings (Perkins and Zheng, 1994; Fukasaku and Wall, 1993). Despite the introduction of a labour contract system as early as 1986, most SOEs are also significantly restricted in the hiring and firing of labour and a cap may apply to the sum of worker remunerations (Hay et al., 1994). Moreover, most SOEs still have access to subsidised loans from the state-owned banking system and are subject to credit restrictions under the credit plan. Finally, the implementation of bankruptcy on loss-making firms has been extremely deficient and management accountability and the structure of property rights is weak. In sum, the operating environment of Chinese SOEs is characterised by opposing trends. Price and trade liberalisation and the increase of domestic competition have served to harden the budget constraint for SOEs, while the credit market and institutional deficiencies related to bankruptcy enforcement continue to shelter loss-makers from pressures for market exit.³

³ The IMF (1993, p. 74) concludes: "The least progress can be observed in [...] the state enterprise sector where, despite the gradual exposure to market forces, many industries remained subject to mandatory planning and nonmarket pricing. These industries have been protected from market forces by a soft budget constraint motivated by the political goals of maintaining employment opportunities and social stability."

We should note that the reform profiles have differed markedly between regions in China, with the coastal provinces spearheading the reform process in almost every area. Structural change, even in the state-owned sector, was facilitated by the inflow of foreign direct investment and the access to international markets. At the same time, the share of non-state activity in the coastal provinces of Zhejiang, Jiangsu, Guangdong, Fujian, and Shandong had increased to 60-70 per cent by 1991 (IMF, 1993, p. 48) providing for a degree of internal competition conspicuously absent in the far less developed inner provinces. This should be borne in mind when the enterprise survey data from four coastal cities are analysed in Sections III and IV.

If the degree to which SOEs continue to be sheltered from competitive pressures remains ambiguous, the impact of industrial reforms on enterprise performance is all the more debated. The discussion generally focuses on the rate of total factor productivity growth as the prime indicator for industrial performance. Estimates on TFP vary substantially over years and regions and over authors. Chen et al. (1988) were the first to find a significant break in the contribution of total factor productivity (TFP) improvements to output growth in 1978. Thus, while TFP growth in their estimation using aggregate industrial data was only 0.8 per cent per annum between 1953 and 1978, it was 5.2 per cent between 1978 and 1985. This result has been corroborated by Lau and Brada (1990) and Beck and Bohnet (1989) using different frontier production function approaches on the same data.⁴ Jefferson, Rawski and Zheng (1992) expand the framework of Chen et al. by including intermediate inputs in the production function. Their results indicate positive TFP growth of 2.4 per cent per annum in SOEs between 1980 and 1988, but around double that rate in collective enterprises (COEs).⁵ Perkins et al. (1993) find positive TFP growth of 3.8 per cent per annum in SOEs (1980-1989) in the special economic zone of Xiamen and a much higher rate of 5.8 per cent for COEs. At the same time, however, Perkins et al. (1993) find that, based on industrial aggregates, TFP growth was stagnant in Shanghai and Beijing, where the pace of economic reforms has been less rapid.

The estimation of TFP growth is extremely sensitive to the use of appropriate input and output deflators (Woo et al., 1994). For instance, Jefferson, Rawski

⁴ Interestingly, the latter study finds that technical inefficiency rather than allocative inefficiency was the major cause of deviations from the best practice between 1978 and 1985.

⁵ Collective enterprises are owned by provincial or district level authorities and are thus subject to considerably harder budget constraints than SOEs (see below).

and Zheng (1992) introduced capital stock and material input deflators that are substantially higher than the deflator for industrial output and therefore largely account for the result of positive TFP growth. The implication of a falling value added deflator is doubted by Woo et al. (1994) who point at the overinflation of output data by SOE managers as an offsetting bias to the possibility that prices of intermediate inputs may have risen more rapidly than output prices. When materials were deflated with the output price deflator, TFP growth became negative in their study of 300 SOEs between 1980 and 1988. Excluding materials from the production function and deflating value added with the output price deflator led to insignificant estimates for TFP growth. The same conclusion is reached for 700 SOEs between 1980 and 1987 in a recent study by Hay et al. (1994). The consequence of stagnant TFP growth in China's industrial SOEs is, of course, that their growth has been largely extensive. As the mobilisation of household savings for industrial investment becomes progressively more difficult, because alternative options for savings are increasingly available, an extensive growth strategy would soon face severe capital shortage.

A falling value added deflator is one way to interpret the puzzle of industrial output growth and falling profitability.⁶ However, the plausibility of the underlying relative price trends in a country experiencing gradual price liberalisation is not easy to gauge, as cross-country comparisons are missing.⁷ Hence Jefferson, Rawski and Zheng have recently pointed towards the equalisation of profit rates across industrial branches in support of their interpretation (Jefferson and Rawski, 1994). A contrarian view on industrial output growth and profit decline doubts the evidence of rapid productivity improvements in SOEs and attributes falling profits to the rising share of worker compensations in industrial value added - a clear signal of non-maximising behaviour in SOEs being no longer under the discipline of central

⁶ Note that this pattern of industrial development is unstable in the long run. Unless the efficiency improvements in the manufacturing sector are large enough to offset the terms of trade loss, capital would tend to move out of this sector and growth would be reduced. Considering China's exceptionally large share of industry in GDP this may even be a desirable development. For instance, similar relative price trends have led to a process of deindustrialisation in Vietnam (Diehl, 1994).

⁷ The comparison to Poland and Hungary made by Woo et al. (1994) is inconclusive because of very different economic structures. Thus, relative price changes depend on the degree of previous distortions which is typically unknown. It is noteworthy, however, that both Poland and Hungary experienced a rising value added deflator in manufacturing during the 1980s. By 1989, both countries had liberalised over half of all producer prices (Commanor and Coricelli, 1991).

planning (Woo et al., 1994). The measurement of allocative efficiency in SOEs thus becomes of central importance for clarifying whether and how SOEs have adjusted to changing incentives since the start of industrial reforms.

III. Has Allocative Efficiency Improved? SOEs Between Profit Incentives and Deficient Sanctions

a) *The Impact of Budget Softness on Allocative Efficiency*

In principle, the liberalisation of prices in economies in transformation should provide incentives for an improvement in the allocation of resources. The waste of specific factors, such as energy, should diminish as their opportunity costs increase.⁸ Taking consideration of the institutional peculiarities of EMEs this may not necessarily be the case, however. In particular in economies where soft budget constraints keep loss-making enterprises afloat and where contract enforcement is weak, the opportunity costs of any factor input at the level of the enterprise may deviate from the price paid (Kornai, 1993; Raiser, 1993). Thus managers may collude with workers and pay out wages in excess of labour's marginal product because the political costs of imposing wage restraint or laying off employees may be higher than the costs of lobbying the government for subsidies. Similarly, a low probability of loan repayment induces enterprises to overborrow and overinvest. Finally, where suppliers cannot legally enforce payment, material inputs may be acquired at effectively no cost.⁹ All these problems are potentially aggravated in SOEs, or in any firm where property rights are unclarified, because managers and workers care less about the long run viability of their firm and may exploit existing assets for the benefit of an increase in current incomes (Schmieding, 1993).

While most of the above factors limiting the effectiveness of price liberalisation in improving the allocation of resources still seem to be present in China to some extent (for details see Perkins and Raiser, 1994), it is likewise evident that the incentives for cost minimisation at the level of SOEs have been

⁸ The extent to which price distortions in socialist economies may have led to allocative inefficiencies is estimated by Hare and Hughes (1992) who find that around a third of all sectors in five European EMEs were producing negative value added at world prices at the start of reforms. Similar calculations for China show that, in 1992, the majority of all downstream consumer goods industries were value subtractors at world prices and would not survive in a free import regime (World Bank, 1994a).

⁹ Of course, a customer defaulting on outstanding payments risks not getting any supplies in the future. However, in the short run both supplier and customer may expect a government bail-out and thus payment defaults are passed on through the entire industrial sector in the form of cumulative debt chains (Rostowski, 1994).

increased substantially over the course of reform. Thus even if material and capital inputs are acquired at a low opportunity cost, the existence of parallel free markets on which these inputs may be traded and the right to retain the profits resulting from such operations signifies that SOEs would face incentives for cost minimisation at the margin (Hay et al., 1994; McMillan and Naughton, 1994). The fundamental question is whether these incentives were sufficient in inducing behavioural changes in SOEs, despite the fact that lack of adjustment would hardly be sanctioned by the threat of market exit.

Evidently, SOEs must be autonomous in their decisions if they are to react to given profit incentives. Hence, remaining government regulations are likely to distort the incentive structure and make an investigation of SOE behaviour in the face of soft budget constraints difficult. In China this is most obvious in the labour market. The virtual impossibility of mass lay-offs signifies that SOEs have only limited room for manoeuvre, for instance in adjusting employment levels to a change in the level or structure of demand. Indeed, even if workers are transferred from the productive core of the firm to its affiliated welfare and service activities, these workers usually remain on the pay roll of the enterprise (see Hay et al., 1994). Moreover, retired workers receive their pensions out of their enterprises' welfare funds. As a result, SOEs facing a negative demand shock would display increasing wage shares inspite of internal adjustment efforts.

Nonetheless, given that SOEs have some degree of autonomy, the labour market is also the area where the conflict between soft budget constraints and market incentives may be most easily analysed empirically. First, data on the costs of labour inputs, such as wages and bonuses are usually available at the firm level.¹⁰ Second, the link of bonus payments to profitability is a clear positive incentive for workers to minimise costs and reduce current claims to the benefit of investment and future income. Third, and by contrast to second, if a firm is making losses and its potential to make profits after some adjustments is low, in the absence of a bankruptcy threat, there are obvious incentives to pay wages by "eating" the firm's assets.

b) Allocative Inefficiency in the Labour Market: Previous Findings

The basic framework for the study of allocative inefficiency is the neo-classical theory of the firm. The first order condition for profit maximisation implies that

¹⁰ By contrast, in segmented capital markets where access to bank lending is discretionary to a significant extent and the enforcement of interest payments is weak, the opportunity cost of capital inputs may be more difficult to measure.

input prices should equal the marginal revenue products for the same inputs. For the case of a Cobb Douglas production function we get the convenient result that at the profit maximum factor shares equal output elasticities. Thus allocative inefficiency may be directly measured as the deviation of factor shares from estimated output elasticities. For the case of labour inputs, wage drift can be estimated as the positive difference between the share of labour in value added and the output elasticity of labour:

$$\begin{aligned}
 \text{i) Production function:} & \quad Y_{it} = A_t^{\lambda} K_{it}^{\beta} L_{it}^{\beta} \\
 \text{Profit maximisation:} & \quad \frac{\partial Y_{it}}{\partial L_{it}} = \frac{W_{it}}{P_t} \\
 & \Rightarrow \beta \frac{Y_{it}}{L_{it}} = \frac{W_{it}}{P_t} \Leftrightarrow \beta = \frac{L_{it} W_{it}}{Y_{it} P_t} \\
 \text{Wage Drift:} & \quad \beta = \frac{L_{it} W_{it}}{Y_{it} P_t} - \mu_{it}, \text{ with}
 \end{aligned}$$

- μ > 0, indicator of wage drift
- Y = real value added
- K = real stock of capital
- L = number of workers¹¹
- A = level of technical efficiency
- λ = rate of neutral technical progress
- W = nominal wage
- P = producer price index
- t = time subscript
- i = individual subscript.

If factor markets are competitive and enterprises are allocatively efficient then the relationships in i) imply that factor returns should be equal across all firms:

$$\text{ii) } \frac{W_{it}}{P_t} = \frac{W_{jt}}{P_t} = \beta \frac{Y_{it}}{L_{it}} = \beta \frac{Y_{jt}}{L_{jt}}$$

i, j = individual subscripts.

Accounting for unmeasurable heterogeneity of factor inputs, the relationship in ii) is unlikely to hold. However, a movement towards allocative efficiency might still be indicated by a falling coefficient of variation of factor returns within a sample of firms or the convergence of factor returns between different enterprise subsamples.

¹¹ In our empirical specification no adjustment for hours worked was possible. Labour was assumed to be homogenous.

The relationships stylised in i) and ii) have formed the basis of most available studies on allocative inefficiency in Chinese SOEs. Jefferson and Xu (1991) find a falling coefficient of variation in factor returns within a sample of 352 SOEs between 1980 and 1987 and a positive correlation of the total compensation package (i.e. including welfare benefits and transfers) with labour productivity. The estimated correlation coefficient in fact is statistically the same as the output elasticity of labour estimated on the same data in Jefferson, Rawski and Zheng (1992). The latter result implies that Chinese SOEs have begun to behave as profit maximisers (see i)). Jefferson, Rawski and Zheng (1992) also find the convergence of factor returns between SOEs and COEs over the 1980s (see ii)). The authors conclude that in spite of the imperfections in labour markets, the gradual evolution of a capital market together with a competitive market structure brought about these surprising results.¹²

In contrast to these findings, a number of studies reveal substantial allocative inefficiency in Chinese SOEs at least for the mid-1980s. Thus Xiao (1990), using census data from 1985, reveals an overinvestment of SOEs in the production of welfare services ("fringe benefits").¹³ These services directly increase workers' incomes and may thus be regarded as an element of wage drift. Similarly, Kalirajan and Yong (1993) show that SOEs in the steel industry by the mid-1980s tended to overborrow from the banking system and have underinvested their retained earnings. This may be interpreted in the sense that SOEs' have preferred to pay out internal funds as bonuses to workers. Perkins et al. (1993), while admitting to a significant improvement in allocative efficiency in Xiamen industry over time, find large differences across sectors. In their study, labour shares in SOEs exceed output elasticities in some industrial sectors, while for non-state firms labour shares lie far below the production function estimates.

Probably the strongest attack against the result of allocative efficiency reached by Jefferson et al. comes from Woo et al. (1994). In their study, the authors

¹² This is in line with the "structure conduct-performance"-paradigm of enterprise behaviour. Against this view, the property rights theory suggests that only fundamental institutional changes regarding the corporate governance of SOEs are likely to induce behavioural adjustments (for a detailed discussion see Buch et al., 1994).

¹³ In Xiao's model this is induced by the absence of a tax on service incomes. Thus capital is allocated to fringe benefits until its marginal return equals the return in investment in production minus the tax rate. In the empirical estimation fringe benefit investment depresses output per worker directly which suggests a lower level of overall productive efficiency due to investment divergence.

present evidence for a dramatic increase in the share of total worker remunerations in value added in SOEs, while the same measure shows a moderate decline in a sample of township and village enterprises (TVEs). For Woo et al. (1994) this is strong evidence for wage drift in SOEs and partly explains the dramatic decline in their profitability. However, Woo et al. (1994) do not compare the data on labour shares with their estimations of the output elasticity of labour. Indeed, the estimated contribution of labour to value added lies above the labour share in both the SOE and TVE subsamples in their paper. The issue of whether SOEs in general have experienced wage drift thus remains unresolved. In the following, new estimation results are presented.

c) Allocative Inefficiency in SOEs: New Evidence from Four Coastal Cities

Our empirical investigation is conducted for 180 enterprises drawn from a sample of 300 enterprises surveyed in the four coastal cities of Guangzhou, Shanghai, Shenzhen, and Xiamen in 1992 (see Perkins and Zheng, 1994). The sample consists of six industrial sectors, namely textiles, garments, electrical appliances, machine tools, iron and steel and heavy metal products. Five ownership types are included; SOEs, COEs, TVEs, joint ventures (JVs) and wholly foreign owned firms (WFOs). Since some of the ownership sub-samples are fairly small (e.g. only 10 firms in the case of the TVEs) we concentrate on the distinction between SOEs and all others. Following Byrd and Lin (1990), COEs and TVEs largely operate in a market environment, due mainly to the fact that their legal owners, the communal or village governments face tough budgetary restrictions and have tended to impose hard budget constraints on the firms under their supervision. We thus consider it appropriate to lump COEs and TVEs together with JVs and WFOs in comparing the behaviour of firms with soft and hard budget constraints.¹⁴ The resulting subsamples, for which data were available, are 77 SOEs and 103 NSF. Data were collected

¹⁴ The group most likely to have softer budget constraints within the NSF sub-sample are JVs. At least where the majority of assets is held by the state, subsidies may well be forthcoming to avoid a retreat of the foreign investor. The reasons for including JVs with other NSFs are partly practical, in that they form the largest group after the SOEs and sample sizes would otherwise be very unequal, and to some extent theoretical, as most JVs export a large share of their output and are thus subject to international competition which should impose a substantial degree of financial discipline.

Table 1 - Summary Statistics for Enterprise Survey by Ownership Categories

Ownership	No. of firms	Statistic	Variable						
			Gross value ^a of output	Net value of ^b output/worker	Capital ^b intensity	Profit/ ^c gross value output	Profit/ ^c capital stock	Average wage ^b + bonuses	Average wage without bonuses
SOEs	77	Mean	13587	18387	19034	0.0257	0.2900	4901	4235
		STD	39935	15361	22579	0.1608	0.6532	1401	1721
NSFs	103	Mean	7164	19597	26870	0.0655	0.4014	5487	5445
		STD	17844	22023	51604	0.1707	1.0185	3669	3116
COEs	34	Mean	1281	7992	9423	0.0220	0.3338	3975	3630
		STD	2418	6288	12044	0.1178	0.8291	1449	1378
TVEs	9	Mean	4993	16478	9327	0.0837	0.3919	4107	3596
		STD	6222	18381	4996	0.0466	0.2976	2845	2898
JVs	48	Mean	12037	29105	46033	0.0801	0.4912	6939	7036
		STD	23775	24657	70883	0.2171	1.3178	4650	3509
WFO	13	Mean	5998	21945	15361	0.1067	0.2757	5565	5699
		STD	15300	25293	8207	0.1221	0.4012	1165	1171

^a in 10 000 Yuan, current prices, per annum. - ^b In Yuan, per annum. - ^c In per cent.

Source: Own calculations, sample survey data.

for the period of 1980 through 1992. However, because responses were extremely thin in most years except 1980, 1985 and 1990-92 the analysis is restricted to these five years.¹⁵

Table 1 gives some summary statistics for the 180 enterprises in the year 1992. We can see that SOEs typically have about twice the size of NSFs as measured by the value of gross output. However, the mean value of net output per worker is rather similar in both subgroups. The average capital intensity is higher in NSFs, but in view of the very high subsample variation, the difference is not significant. With respect to profits, both profit margins (profit/gross value of output) and profit rates (profits/capital stocks) are higher on average in the non-state sector, though the standard deviations are again very large in both sub-samples. The average worker remuneration is slightly higher in NSFs but, as in the case of the capital intensity, the subsample variation is also higher. Interestingly, while the inclusion of bonuses increases wage differentials across firms in the non-state sector, in SOEs the inclusion of bonuses leads to a much reduced variation coefficient of worker remunerations. Moreover, bonuses are a much more important component of workers' incomes in SOEs than in NSFs. However, from Table 1 no conclusions can be drawn as yet on the sign and significance of the correlation between average compensation and labour productivity. Overall, the variations within the ownership subsamples are clearly larger than the differences between them. The main reason is the overrepresentation of JVs in the NSF subsample. In this respect our sample is untypical for China as a whole where TVEs and COEs dominate the "non-state" sector.

In addition to the quantitative variables introduced above, the survey contained a number of qualitative questions to enterprise managers on their autonomy in labour relations. As noted above, limited autonomy in SOEs' labour relations affects the usefulness of comparing allocative efficiency in SOEs and NSFs as indication of behavioural differences. Table 2 shows the distribution of decision making authority for six areas in labour relations in both ownership categories. The remarkable result is that by 1992 between 60 and 80 per cent of all labour related decisions in our sample were made either by the firm or by its board of directors. Supervisory authorities in conjunction with the firm had still significant

¹⁵ The size of the sample varies between years. Thus most NSFs came into existence only after 1985. The first two years thus contain only around half of the observations in later years.

Table 2 - Autonomy and the Labour Market: Frequency Distribution in SOEs and NSFs in Per-Cent of Total^a

Level of Decision Making	Firm	Supervisory Authority	Firm and Supervisory Authority	Director or Board of Directors	Representative Committee of Workers
Decision over:					
Total labour force	47	3	13	33	3
SOEs	50	4	20	2.2	2
NSF	44	3	8	41	4
Source of employees	45	5	17	30	1
SOEs	47	4	27	21	1
NSFs	45	5	12	34	3
Internal assignment	27	2	11	56	3
SOEs	36	—	14	47	4
NSFs	21	3	8	63	4
Total wages for each type of workers	32	9	11	40	9
SOEs	39	11	17	19	15
NSFs	24	4	9	53	9
Total bonuses for each type of workers	42	2	5	43	7
SOEs	56	2	5	27	10
NSFs	28	3	9	54	5
Dismiss workers	36	2	9	52	1
SOEs	39	3	13	27	18
NSFs	32	1	5	53	7

^a Total number of firms: 201.

Source: Own calculations, sample survey data.

influence over the source of employees and the total wage bill in SOEs.¹⁶ Workers' councils were also important in deciding total wage levels and in 18 per cent of all SOEs were responsible for decisions concerning the dismissal of workers. These results suggest that while some SOEs may still have faced substantial restrictions, overall the operating environment of SOEs and NSFs did not differ substantially in the area of labour relations. Thus, were we to find wage drift in SOEs this would strongly indicate non-maximising behaviour.¹⁷

¹⁶ Note that due to the inclusion of COEs and TVEs in the sample of NSFs, this subsample also reports some degree of influence of supervisory authorities. Even JVs may be restricted by labour market regulations to some extent.

¹⁷ This is of course a rather unexpected result in view of our previous discussion. While it is convenient for our analysis it also limits the degree to which the results can be generalised. Again, the coastal location of all surveyed enterprises probably introduces

Table 3 presents the average labour shares in the net value of output (NVO) in our sample for SOEs and NSFs separately. They are computed as the sum of worker remunerations divided by NVO for each firm and each of the five years 1980, 85, 90, 91, 92. The sum of worker remunerations includes the total wage bill, the sum of bonus payments and all welfare expenses of the firm. Because of very poor responses, data on investment in worker accommodation, allegedly a crucial part of in-kind benefits, could not be included. Another factor leading to a bias in the computations is the exclusion of all firms with negative value added, as their inclusion would have lowered the average labour share although the true implications are exactly the opposite. Finally, a few extreme outliers were purged to reduce the variability over time in the average figures.¹⁸ Table 3 thus gives only a lower bound estimate of the true labour shares.

Table 3 - Labour Shares (Broad Measure) in Gross and Net Value of Output by Ownership and Industry^a

Industry	Net value of Output				
	1980	1985	1990	1991	1992
SOEs	0.329	0.388	0.523	0.577	0.548
Textiles	0.298	0.355	0.615	0.682	0.811
Garments	0.284	0.349	0.622	0.909	0.753
Electrical appl.	0.418	0.316	0.427	0.293	0.254
Iron + steel	0.379	0.528	0.409	0.422	0.400
NSFs	0.520	0.540	0.600	0.527	0.615
Textiles	-	-	0.190	0.624	0.379
Garments	0.491	0.546	0.689	0.564	0.747
Electrical appl.	0.303	0.513	0.357	0.329	0.356
Iron + steel	0.497	0.384	0.536	0.463	0.292

^a Labour shares are calculated as $(W+W^S) \times L/Q$, where W is average wage + bonuses, W^S is average welfare payments per worker and Q is net value of output.

Source: Survey data collected by author.

an autonomy bias. However, at least the direction of the bias is clear: if we find behavioural differences between SOEs and NSFs and resulting allocative inefficiency in the former, in more regulated firms in the interior this is likely to be worse. By contrast if the SOEs in our sample turn out to be generally efficient, then this might be considered a beneficial consequence of this high degree of autonomy.

¹⁸ The proportion of firms excluded because of data problems did not amount to more than 5 per cent of the total. More NSFs were affected than SOEs, probably because of defective data reporting.

Table 3 confirms that labour shares in Chinese SOEs have increased since the start of economic reforms. However, at its peak in 1991 the share of labour in the net value of output was only 0.577, a figure in line with the average of around 0.6 for developing economies. Labour shares in NSFs have been fairly constant around a very similar level of about 0.55. Thus we can observe a certain degree of convergence in labour shares across ownership, a notable indication of allocative efficiency in our sample. Table 3 also presents labour shares at a sectoral level of disaggregation for those four sectors which had at least five firms in each ownership category. The results show marked cross-sectoral differences but again, apart from the textiles sector, a certain degree of convergence of labour shares within sectors. In order to derive clear conclusions about allocative efficiency in our sample, production function estimates of output elasticities are needed.

In the computation of output elasticities of labour for our sample, the following issues had to be addressed. First, we had to check whether the Cobb Douglas specification summarised the production data in our sample accurately. To this effect, the Kmenta approximation to a translog function was run and the significance of the higher order term tested using t-ratio tests (see Hansen, 1994, p. 45). Second, our data was pooled over five years distributed across a thirteen-year period. Thus structural stability tests on the production function specification had to be conducted. Third, any comparison of allocative efficiency in SOEs and NSFs required the computation of separate output elasticities for the two subsamples. F-tests for the hypothesis of identical technologies across ownership could then be used to determine which estimate of the output elasticity of labour should be used for each sub-sample.

The first issue was easily resolved. We ran the Kmenta approximation for each of the five years, 1980, 1985, 1990, 1991, 1992, and in none of them was the higher order term significant. Although this result could be due to multicollinearity between the factor inputs and their cross-product, it is in line with previous findings (Chen et al., 1988; Perkins et al., 1993). This supports our theoretical framework for the measurement of allocative efficiency. The second issue was less straightforward. The important question for our purposes was to test for a change in the slopes of the production function, not for changes in the technological constant over time. Thus year dummies for technical progress or overall efficiency improvements were included in the pooled regression. An F-test comparing the residual sums of squares between the pooled and the single year equations and F-tests on the exclusion of year

specific slope dummies did not allow the rejection of the hypothesis that technology was constant over time.¹⁹ Third, a Chow test for identical technologies across ownership was rejected (F-ratio = 7.53 with a significance level below 1 per cent). Thus our final specification was run by including slope dummies and a constant dummy for SOEs (standard errors in parentheses):

$$\begin{aligned} \text{iii) } \ln \text{NVO}_{it} = & -1.23 + 1.02 \text{ DSOE} + 0.32 \ln K_{it} + 0.84 \ln L_{it} - 0.12 \text{ Dln}K_{it} - 0.05 \text{ Dln}L_{it} \\ & (0.20) \quad (0.35) \quad (0.04) \quad (0.06) \quad (0.06) \quad (0.08) \\ & - 0.56 \text{ D80} - 0.16 \text{ D85} - 0.23 \text{ D90} - 0.15 \text{ D91} \\ & (0.13) \quad (0.11) \quad (0.09) \quad (0.09) \\ R^2 = & 0.70 \quad \text{DW} = 1.03. \end{aligned}$$

Equation iii) yields a number of interesting results. First, the output elasticity of labour is slightly lower in SOEs than in NSFs. At the same time, the output elasticity of capital is also lower in SOEs, and this difference is statistically significant.²⁰ In other words, while the SOE sector displays constant returns to scale, there are strongly increasing returns in the non-state sector (F-ratio of 20.09 with a significance level below 1 per cent). This result is largely due to the inclusion of COEs among the NSF subsample. COEs are by far the smallest firms in the sample and operate at a lower level of technical efficiency. This also explains the surprising positive value of DSOE, although its significance level is low. One further noteworthy result from equation iii) is the clear evidence for productivity improvements over the reform period. Average technological efficiency by 1992 had improved by 56 per cent since 1980, but this increase was largely achieved before 1985. Average productivity in our sample fell between 1985 and 1990 and has only recently risen again rapidly. Moreover, cyclical factors may be driving this result, as 1980 was a crisis year and 1985 and 1992 were years of high economic growth. When the regressions were run separately for each ownership category, it further appeared that efficiency improvements were substantially higher in NSFs than in SOEs. In the former case, the productivity increase since 1980 was 52 per

¹⁹ The values were: F (Chow test for structural stability) = 1.918 with a significance level of 12.5 per cent; F (slope dummies): 1980 = 1.03 (0.36) significance 1985 = 0.39 (0.69) levels for the hypothesis 1990 = 0.31 (0.73) of no structural break 1991 = 1.34 (0.26) in brackets 1992 = 0.50 (0.60).

²⁰ While we do not further investigate this result, it concurs well with the expectation that SOEs have overinvested in the past and part of their capital stock may be obsolete (Siebert, 1991).

cent, while in the latter it reached only 29 per cent.²¹ Hence the NSFs in our sample have progressively closed an efficiency gap existing in the early 1980s.

Turning to the comparison of output elasticities with the data on labour shares in Table 3, the hypothesis that SOEs at large have experienced wage drift in recent years must be rejected. The estimated output elasticity of labour is almost 20 percentage points above the share of labour in NVO by the 1990s. This result is confirmed for the case of the NSFs. The increase in labour shares in SOEs must thus be interpreted as an improvement in allocative efficiency, rather than an indication for asset depletion by workers councils as suggested by Woo et al. (1994). Moreover, as total factor productivity in SOEs has improved only little, we can hypothesise that technical efficiency has not significantly improved in the SOEs in our sample. NSFs have achieved some of their output gains through an outward shift of their production possibilities and thereby have closed the efficiency gap to the SOE sector. Excluding COEs, NSFs are overall more efficient than SOEs. This is a reminder to Chinese policy makers that future growth will have to be generated increasingly by technical upgrading.

The robustness of the above conclusion of relative allocative efficiency in Chinese industry was finally tested at the sectoral level. Because the number of observations was too small in 1980 and 1985 to allow for testing for structural stability over time, we ran pooled regressions only from 1990 to 1992 for the textiles, garments, electrical appliances and iron and steel sectors.²² F-tests again supported the hypothesis of constant technology over these three years. When comparing the output elasticities of labour estimated in Table 4 with labour shares in Table 3, it emerges very nicely that the only sector in our sample that has experienced wage drift by SOEs is the textiles industry. This is also the only sector where we could not find a convergence of factor shares across ownership. Moreover, the textiles sector shows striking decline in productivity by 67 per cent since 1985, in contrast to strong TFP growth in electrical appliances and garments. Note, that in a total of 31 textiles firms, 21 are SOEs. The results of the sectoral production function estimates are not presented here, as the paucity of the data in earlier years allows no firms

²¹ The higher overall efficiency increase in the pooled sample reflects shifts in the composition of our sample.

²² Due to the small number of observations separate regressions for heavy metal products and machine tools and for NSFs and SOEs within the other four sectors were not attempted.

Table 4 - Production Function Estimates by Sector, 1990-92^{a)}

Sectors	Dependent Variable: Net Value of Output			
	Textiles	Garments	Electrical appliances	Iron & steel
Independent variables ^{a)}				
Constant	-15.6 (10.6)	-1.17 (0.72)	-2.98	-188.4 (238.2)
Capital	0.43*** (0.07)	0.32 (0.07)	0.28*** (0.07)	0.40*** (0.12)
Labour	0.57*** (0.07)	0.68 (0.07)	0.91 (0.09)	0.60*** (0.12)
Time	0.15 (0.12)	0.054 (0.059)	0.25** (0.10)	0.09 (0.12)
R ²	0.75	0.73	0.77	0.88
Number of observations	77	227	166	42
F-test ^{b)} for structural stability 1990-92	0.04 (0.99)	0.80 (0.49)	1.87 (0.12)	3.12 (0.02)
for constant returns of scale	1.11 (0.29)	0.93 (0.34)	8.05 (0.01)	0.25 (0.62)
a) Standard errors in brackets. - b) Significance level in parentheses.				
Two stars indicate 5 per cent significance. Three stars indicate 1 per cent significance.				

Source: Sample Survey data, own calculations.

conclusions. However, they yield qualitative support for the view of increasing allocative inefficiency in the textiles industry.²³ We can thus conclude from the empirical investigation in this subsection that the hypothesis of wage drift in SOEs must be rejected overall, with the qualification that, in recent years, SOEs in the textiles sector have tended to raise their labour shares above the output elasticity of labour. While this should lower the profitability of textiles producers in our sample, the causes of the overall decline in SOE profitability remain unclarified. This is to what we now turn.

²³ An interesting side result of these sectoral computations is that TFP growth is the lower the lower is the output elasticity of labour. This could indicate substantial labour hoarding in those sectors hit by the direction of structural change.

IV. Explaining the Decline in Industrial Profitability in China

We start by summarising the data on profitability developments both at the level of the national economy and for our enterprise sample. Subsequently, the factors which might have determined profitability developments in Chinese industry are discussed. Finally, we turn to an empirical investigation of profit margins in our enterprise sample.

a) *The Trend of Declining Profits:*

In 1980, average profit margins in SOEs were 25 per cent, in COEs 27 per cent, and in other enterprises (including mainly TVEs at that time) 38 per cent. By 1992, average profit margins were 9.7 per cent in SOEs, 10.1 per cent in COEs and 11.1 per cent in all other enterprises (Zheng, 1994). The share of SOEs making losses was 9.7 per cent in 1985, but rose to 23.4 per cent in 1992 and 33 per cent in 1993. The corresponding figures for COEs were 11.7 per cent in 1985 and 13.7 per cent in 1992. In 1993, losses by SOEs reached 84.4 billion Yuan, representing 3.2 per cent of GNP. Thus, although the decline in profit margins has affected the entire industrial sector, the share of loss-making SOEs is significantly higher and state-sector losses, even exclusive of implicit subsidies through the banking system and discretionary taxation, are taking on serious proportions (Perkins and Raiser, 1994).

The overall decline in industrial profitability in China was accompanied by a significant reduction in the cross-sectoral variation of profit margins. In 1980 the average ratio of gross profits to fixed capital assets was 33.7 per cent with a standard deviation of 27 points. In 1992 the mean profit rate was 16.8 per cent and its standard deviation 5 points. This implies a reduction in the coefficient of variation from 0.80 to 0.30. To the extent that SOEs were concentrated in the high profit sectors in 1980, entry by NSFs into a previously protected market may have contributed to the rapid decline in SOE profitability (Jefferson and Rawski, 1994; Zheng, 1994).

In our sample, the average profit margin in 1980 was 12.1 per cent in SOEs and 6.5 per cent in NSFs. In 1992 the figures were 2.6 per cent in SOEs and 6.6 per cent in NSFs. In 1980, only two firms in our sample were making losses, one SOE and one JV. In 1992, the share of SOEs making losses was 18.4 per cent, while it was 22.2 per cent in NSFs. Our data thus display significant differences to the national totals. Both SOEs and NSFs are less profitable in our sample than at the national level. One possible explanation lies in the high degree of local competition in the four coastal cities from which

Table 5 - Profit Margins, Sample Mean and Standard Deviation, 1980, 1992 by Industrial Sector and Ownership

Sectors	Ownership	1980		1992	
		Mean profit margin	Standard deviation	Mean profit margin	Standard deviation
Textiles	SOEs	0.111	0.052	-0.067	0.250
	NSFs	-	-	0.190	0.321
Garments	SOEs	0.158	0.053	0.028	0.131
	NSFs	0.081	0.043	0.048	0.139
Electrical appliances	SOEs	0.115	0.096	0.089	0.060
	NSFs	-0.091	0.225	0.058	0.156
Machine tools	SOEs	0.180	0.043	0.061	0.036
	NSFs ^{a)}	0.070	0.038	0.035 ^{b)}	-
Iron & steel	SOEs	0.082	0.084	0.021	0.039
	NSFs	0.027 ^{b)}	-	0.013	0.095
Heavy metal products	SOEs ^{a)}	0.120 ^{b)}	-	0.055	0.032
	NSFs	0.149	0.027	0.013	0.095

a) Only 2 firms. - b) Only 1 firm.

Source: Own calculations based on survey data.

our observations were drawn. Apparently, competition depressed average NSF profits as early as the start of economic reforms. At the same time, our sample mirrors the downward national trend in the profitability of SOEs. Note, finally, that profit margins vary substantially within the NSF sector, as documented below. This high variation suggests that in our sample, SOEs do not have significantly lower profits than NSFs.

Table 5 summarises the sample data on profit margins by ownership and on a sectoral level both for 1980 and 1992. The small sub-sample sizes limit the scope for clear-cut comparisons. Nonetheless, we can note a few interesting details. First, there is no clear indication of a convergence of profit margins either within or across sectors. Relative price trends do not lead to an equalisation of profit margins in our sample and firm specific factors seem to dominate. Second, the one sector in which SOEs by 1992 performed badly in terms of their profitability is the textiles industry. This is also the sector where the clearest evidence for wage drift in SOEs emerged from the analysis above. The contrasting high average profitability in NSFs supports the suggestion that low profitability in SOEs in the textiles industry may be due chiefly to their allocative inefficiency.

b) Determinants: National Factors

Turning to the possible determinants of the overall profitability decline, the increase of competitive pressures through dynamic market entry by NSFs and terms of trade losses for the manufacturing sector are the strongest rivals to the hypothesis of allocative inefficiency. In order to conduct a statistical test of the effects of competition on industrial profitability, we regressed average profit margins in thirty Chinese provinces against the share of NSFs in industrial output. The labour share was included as an additional variable to test for the effect of allocative inefficiency in China as a whole. The regression was run for 1989 and 1990. Unfortunately, more recent data were not available. Table 6 reveals that the share of NSFs in industrial output has a significant negative impact on average industrial profitability in China. Specifically, a one percentage point increase in the share of NSFs in industrial output decreases the profit margin by 0.2-0.3 percentage points. As the share of NSFs in industrial output at the national level increased by around 30 percentage points since 1978, this would account for a reduction in profitability of 6-9 percentage points, i.e. around one third to one half of the actual total decline. The share of labour in the gross value of output also has a significant negative impact, but its size is much smaller. We conclude that competitive pressures have indeed eroded profit margins in China.

Table 6 - Profitability and Competition in 30 Chinese Provinces, 1989 and 1990^{a)}

Independent variables	Dependent variable: gross profits/gross value of output	
	1989	1990
Constant	29.7*** (6.10)	35.8*** (7.96)
Share of NSF output in total industrial production	-23.9** (8.24)	-33.0** (9.85)
Labour share	-13.0** (5.91)	-2.0** (0.74)
R ²	0.26	0.31

a) Standard errors in parentheses.
Two stars indicate 5 per cent significance.
Three stars indicate 1 per cent significance.

Source: SSB (1992); data provided to the author by the State Statistical Bureau of China.

The impact of relative price developments on industrial profitability is less easy to gauge. As noted above, the variability of sectoral profit margins has been greatly reduced in line with falling average profits. This could be due to the erosion of implicit subsidies in the course of price liberalisation.²⁴ In general the manufacturing sector has suffered a terms of trade loss, as material input and capital goods prices have increased more rapidly than the industrial output price deflator. Zheng (1994) presents data that show a 96 per cent increase in output prices between 1984 and 1992, against an increase of 179 per cent in material input prices. Accounting for the ensuing change in the composition of gross industrial output, this yields a value added deflator of 107.4 for 1992 (1984=100). During the same period producer prices increased by 48 per cent. In other words, subtracting nominal input costs from sales revenue, the real share remaining for labour payments and profits continuously declined.

Table 7 - Relative Price Developments and Changes in Industrial Profit Rates, 12 Sectors, 1980-92

	pM / pQ*	Profit rate in 1980	Change in profit rate 1980/92 as a ratio to 1980 profit	Profit rate in 1992
Metallurgy ^{a)}	121	35.06	0.46	18.87
Electricity ^{b)}	195	15.31	0.37	9.60
Coal ^{c)}	133	7.5	1.20	-1.53
Petrol ^{d)}	146	86.72	0.71	24.74
Chemical ^{e)}	167	21.95	0.34	14.39
Machinery ^{f)}	185	15.13	0.10	13.61
Construction ^{g)}	124	20.26	0.18	16.58
Forest products ^{h)}	126	21.84	0.65	7.72
Food	175	31.11	0.74	8.03
Textiles	135	87.90	0.89	9.25
Garments	183	93.08	0.78	20.06
Paper	115	30.80	0.59	12.69
Electrical appliances	179	19.51	0.25	14.71

*pM = sectoral price deflator of material inputs (1980=100); pQ = sectoral price deflator of industrial output (1980=100).
^{a)}Fabricated metal (incl. iron and steel and heavy metal products). - ^{b)}Electrical power. -
^{c)}Incl. coal coaking and coal mining. - ^{d)}Petroleum processing. - ^{e)}Chemical industry. -
^{f)}Machine-building (incl. machine tools). - ^{g)}Building materials. - ^{h)}Lumber processing and lumber.

Source: Zheng (1994).

²⁴ The other explanation are improvements in the mobility of capital across sectors. However, while this would reduce profit variability it should not lead to a decline in profits.

Combined with the fact that real producer wages in industry have increased at least as rapidly as labour productivity (e.g. Woo et al., 1994), this necessarily leads to lower overall profitability. On a sectoral level, however, this relationship is far from clear cut. Table 7 presents the ratio of material to output price increases between 1980 and 1992 for 12 industrial sectors and the

Table 8 - Causes given by Enterprise Managers to a Decline in Profitability, in percent^{a)}

	Most important		Second		Third	
	SOEs	NSFs	SOEs	NSFs	SOEs	NSFs
<i>Market and Management Conditions</i>						
1) Change in level of market demand	44	44	8	9	11	7
2) Change in structure of market demand	7	4	18	5	6	4
3) Autonomy in production	-	1	8	-	4	-
4) Autonomy to set prices	3	1	6	2	11	7
5) Information on markets	5	9	1	6	4	5
6) Foreign exchange and import license	3	1	-	2	1	-
7) Access to export markets	1	4	1	1	1	3
<i>Production Level Factors</i>						
8) Input costs	10	5	11	3	11	2
9) Investment funds	-	2	8	7	-	7
10) Working capital	11	10	10	11	7	8
11) Quality of products	3	7	10	21	10	12
12) Capacity	1	2	1	7	6	11
13) Technology employed	-	2	-	4	4	4
14) Availability of skilled workers	3	2	3	7	3	7
15) Sufficient raw materials	7	4	10	11	17	15
16) Sufficient energy	-	2	3	2	4	6
17) Others	3	2	1	3	-	2

a) Number of firms: 201.

Source: Sample survey data, own calculations.

change in their profit rate (gross profit over net value of fixed assets) normalised by 1980 profit.²⁵ No clear pattern is detectable with respect to the change in profit rates and the change in relative prices. Amongst the sectors most hit by a negative terms of trade shock are sectors with high profitability in 1992, such as garments and machinery. Coal is the least profitable sector

²⁵ Profit margins would have been preferable in our context. However, we had to rely on data provided by Zheng (1994), as the original sources were not available.

although input prices have not outpaced output prices by much. Clearly, the level of price distortions at the start of economic reforms and the differentiated impact of NSF entry and price liberalisation across sectors continue to dominate relative price effects in the structural adjustment of Chinese industry.²⁶

c) An Empirical Analysis of Firm-Specific Factors in the Profitability Decline

Apart from the two national trends investigated above, factors specific to each firm might also explain a good deal of profitability developments in China. Thus it is to be expected that competitive pressures affect enterprises differently and that the individual reaction to such pressures determines the firm's profitability. Similarly, relative price developments might induce different reactions at the firm level, such as a reduction in input requirements by exploiting substitution possibilities. Further, although allocative inefficiencies could not be identified on the basis of average sample figures, individual firms might still pay excessive worker remunerations and thereby lower profits. The qualitative part of our enterprise survey included a set of questions to enterprise managers on the determinants of profitability. The responses are summarised by the rank of importance in Table 8.

The striking result in Table 8 is the overwhelming predominance of market conditions in the determination of enterprise profitability, regardless of the ownership form. Close to one half of all surveyed enterprises reported that a change in the level of market demand was the most important factor determining their profitability. In line with the above findings, we may posit that market entry of NSFs has reduced SOEs' market shares and thereby reduced profitability. SOEs were also affected relatively more by changes in the structure of market demand than NSFs, a result that is compatible with the higher degree of planning distortions pre-reform in the former. In third place, SOEs accord some importance to autonomy in production and price setting, but clearly this is no longer the decisive factor in our sample. On the production side, input costs, including labour costs, and access to working capital are the two crucial factors influencing enterprise profitability. For SOEs, the importance of working capital is explained by the structure of enterprise finance under central planning which has left most firms highly undercapitalised (Calvo and

²⁶ According to the IMF (1993, p. 29) over half of all industrial losses are accounted for by sectors still under substantial administrative price control, particularly energy production. The implication is, of course, that further liberalisation in this area will lead to further terms of trade losses in all other sectors.

Coricelli, 1992). Despite of a higher share of self-financing NSFs also seem to be capital constrained. Interestingly, access to raw materials, mentioned by Hay et al. (1994) as an important factor in determining profit margins is not considered of primary importance, although 17 per cent of SOEs and 15 per cent of NSFs rank it as the third most important factor. Again, the coastal location probably accounts for this divergence. Finally, NSF managers rank production factors such as the quality of products, availability of skilled labour, technology and productive capacity in second place far more often than their colleagues in SOEs. This is particularly the case for WFOs and JVs which export a considerable share of output. Thus we find some support for the contention that Chinese consumer goods markets are not yet up to international quality standards and that the competitiveness of domestic producers, particularly SOEs, may be quite low (World Bank, 1994; Perkins and Raiser, 1994).

Table 8 overall confirms the importance of firm specific factors in determining enterprise profitability. In what follows we attempt to quantify the impact of firm specific and national factors on enterprise profit margins in our sample. Unfortunately, because of weak responses, the sample size in this part was reduced to around 60 enterprises. In a second step we verify the conclusions reached in previous studies about the impact of worker incentives and enterprise autonomy on profitability (e.g. Groves et al., 1994; Hay et al., 1994). The following variables were included in the basic model of profit margins.

- ALEFF: This variable gives the labour share in each firm minus the ownership specific output elasticity of labour. It thus measures allocative inefficiency at the firm level. Unless differences in labour shares are due to heterogenous labour inputs, ALEFF should be negatively correlated with profit margins.²⁷
- WKQ: This is the ratio of working capital to the gross value of output at the end of the year. In line with the results in Table 8 this is expected to have a positive coefficient.
- QM: This is the ratio of material inputs to gross output in nominal terms. Thus this variable measures the availability of raw materials and at the

²⁷ Of course, with rigidities in wage rates or employment levels an exogenous output shock will simultaneously reduce profits and raise labour shares. A significant sign for ALEFF merely implies that in the short run, adjustment costs to demand shocks are typically shouldered by capital owners. This is probably true for any economic system. Notably, however, Perkins and Raiser (1994) found that SOEs adjust employment levels more slowly to a change in output.

same time proxies for the impact of relative price changes. As the questionnaire results reported above accord little importance to raw material access, we follow Hay et al. (1994) in expecting a negative coefficient on QM. Hence, larger dependence of the production process on material inputs increase the vulnerability to a relative price shock.

- DEFVA: This variable is the ratio of material prices over output prices as shown in Table 7 normalised to zero for the case of no terms of trade changes. The sign of the coefficient on DEFVA should accordingly be negative. In our model DEFVA is used interchangeably with QM.
- KL: This is the capital intensity of the firm. This should obviously influence profit margins positively, if returns on fixed assets are equalised across firms.
- WF: This gives the total workforce employed by the enterprise and is used as a proxy for scale. Under strongly increasing returns, the effect of WF on profit margins should be positive.
- SPWW: This is the share of productive workers in the total workforce. Chinese SOEs in particular have a number of service workers on their wage bill due to their non-productive obligations in the area of worker and community welfare. As shown by Chen et al. (1988) taking account of these non-productive workers substantially increases TFP growth in Chinese industry. By implication we expect profits to be higher in firms where SPWW is high.
- STOCKS: This variable measures the share of output inventories in the gross value of output at the end of the year. Here it is used as a proxy for demand conditions for the individual enterprise. A negative coefficient is expected, as stock demand should increase the build-up of inventories. Unfortunately, this variable is not available for the whole sample.
- EXS: This is the share of exports in gross output. The sign of this variable is not clear a priori. In principle it should be positive, as it reflects competitiveness and access to additional markets in times of slack domestic demand. However, due to foreign trade and exchange controls (Fukasaku and Wall, 1993), exports may well be mandated and influence enterprise profitability negatively. These two effects might well cancel out.

Overall, these nine variables proxy the production side factors relatively well. However, market conditions and management form are clearly underrepresented, obviously because accurate measurement is far more difficult. In order to account for this defect, we further included a number of

dummy variables for the location of the firm, the six industrial sectors and for ownership type in a separate regression. The locational variables proxy market structure to some extent, as the share of NSFs in the four cities differs substantially, both in the sample and at the aggregate level. Thus Shanghai (DLOC3) has the lowest share of NSFs in both cases. This should *ceteris paribus* lead to higher profits. We also included a dummy for location in an export development zone (DEDZ). Although the same reasoning applies for the effect of this dummy as for the export share (EXS), in EDZs exporting firms have access to cheap imported inputs which may boost their profitability. The industry dummies contain all industry specific factors not measured by the relative price variable DEFVA. This might include the effects of cross-sectoral demand shifts, e.g. from capital to consumer goods producers. The evidence on sectoral profit rates discussed before implies that the industry dummies should lose significance over time, while DEFVA should become more significant. On the basis of the summary data in Table 5 we should not expect a large significance of the SOE dummy. However, dummies for WFOs and possibly TVEs are expected to have a positive sign.

The regressions were again run for each of the five years 1980, 1985, 1990, 1991, 1992. This time, structural stability of the model was rejected overall ($F=127$ with a significance level of 0.0 per cent). Moreover a number of variables were not significant in any of the five years. First, QM fails to capture relative price effects and DEFVA was thus substituted for this variable. Second, the lack of significance of KL indicates the very low return on capital in China. At least in SOEs, overinvestment is clearly documented. Moreover, investment divergence to welfare services is included as non-productive assets in our capital stock data thereby reducing the impact of capital intensity on profit margins. An adjusted series could not be constructed for lack of data. Third in the sample overall scale effects are not present. Finally, the export share remained insignificant probably due to the mentioned ambiguities of China's trade policy. All four variables were dropped from subsequent estimations.

All other variables are significant in at least one of the five years. It emerges very clearly from Table 9 that ALEFF has a strongly negative impact on profitability, as expected. Similarly, a decline in the terms of trade, indicated by a positive value of DEFVA has a significant depressing effect on enterprise profitability in our sample, although this effect is strong only in 1992. Access to working capital, on the other hand, influences profit margins positively. While the signs on ALEFF, DEFVA and WKQ are as expected, SPWW is only

Table 9 - Determinants of Profitability in Chinese Industry, 1980-92

Independent variables	Dependent Variables: Gross Profit/Gross Value of Output PROM				
	1980	1985	1990	1991	1992
Constant	-0.04 (0.07)	0.30 (0.10)	-0.17* (0.09)	-0.02 (0.07)	-0.06 (0.14)
ALEFF	-0.15*** (0.03)	-0.003 (0.008)	-0.25*** (0.04)	-0.06*** (0.02)	-0.07** (0.03)
DEFVA	-	-0.10 (0.07)	-0.09* (0.05)	-0.01 (0.05)	-0.31*** (0.10)
WKQ	0.04 (0.02)	0.09*** (0.03)	0.017 (0.012)	0.10** (0.04)	0.60*** (0.03)
SPWW	-0.07 (0.07)	-0.29** (0.12)	-0.07 (0.08)	0.03 (0.07)	-0.05 (0.20)
STOCKS	-0.07 (0.06)	-0.17 (0.12)	0.41*** (0.05)	-0.25** (0.11)	-0.68*** (0.20)
R ²	0.41	0.48	0.70	0.43	0.93
Number of firms	44	34	42	40	45

F-test for structural stability F = 127 (0.00)
 One star indicates 10 per cent significance.
 Two stars indicate 5 per cent significance.
 Three stars indicate 1 per cent significance.

Source: As Table 1.

significant in 1985 but its coefficient is unexpectedly negative. STOCKS is significant from 1990 through 1992, but in 1990 the coefficient is positive, while in the other two years STOCKS has the expected negative sign.²⁸ Note, that data for these two variables in particular were scarce.²⁹ We thus decided to omit them from the model, both in order to gain additional observations and to have unambiguous results.

²⁸ Possibly inventories from previous years were carried forward in 1990, the trough year of the recession 1989-1991. Financing of such inventory accumulation through the banking system has led to the rapid build-up of a bad loan problem in Chinese industry.

²⁹ The paucity of the data is particularly annoying in the case of SPWW, as this variable might have provided a clue to the quantitative importance of welfare services in workers' incomes (see Jefferson and Xu, 1991).

Table 10 - Determinants of Profitability in Chinese Industry, 1980-92, Including Industrial, Locational and Ownership Dummies^{a)}

Independent variables	1980	1985	1990	1991	1992
Constant	-0.06 (0.04)	0.05 (0.07)	-0.37*** (0.11)	0.08 (0.08)	-0.33*** (0.12)
ALEFF	-0.16*** (0.03)	0.00 (0.01)	-0.31*** (0.07)	-0.07*** (0.02)	-0.12*** (0.02)
DEFVA	-	-0.10 (0.09)	0.07 (0.08)	-0.06 (0.08)	-0.23* (0.13)
WKQ	-0.03** (0.01)	0.05* (0.03)	0.02 (0.02)	-0.07 (0.06)	0.54*** (0.03)
DIND0 (textiles)	-0.02 (0.03)	0.00 (0.07)	-0.01 (0.05)	-0.05 (0.05)	0.02 (0.08)
DIND2 (electrical appliances)	0.03 (0.03)	0.01 (0.06)	-0.04 (0.05)	-0.04 (0.05)	-0.03 (0.07)
DIND3 (machine tools)	0.10* (0.06)	0.16 (0.10)	0.22*** (0.08)	-0.02 (0.09)	0.002 (0.15)
DIND4 (iron+steel)	-0.04 (0.04)	-0.03 (0.06)	-0.003 (0.09)	-0.11 (0.08)	0.11 (0.12)
DIND5 (heavy metal products)	-0.09* (0.05)	0.02 (0.10)	0.22 (0.12)	-0.06 (0.10)	-0.01 (0.13)
DLOC3 (Shanghai)	0.02 (0.03)	0.03 (0.06)	-0.03 (0.06)	-0.02 (0.05)	0.09 (0.09)
DEDZ (export develop- ment zone)	-0.03 (0.03)	-0.01 (0.04)	0.09** (0.04)	0.01 (0.04)	0.06 (0.07)
DSOE	-0.00 (0.03)	0.05 (0.05)	0.04 (0.04)	0.04 (0.04)	0.02 (0.07)
DTVE	-0.02 (0.04)	0.09 (0.09)	-0.08 (0.07)	0.08 (0.07)	0.08 (0.14)
DWFO	-0.05 (0.04)	-0.01 (0.07)	-0.14 (0.14)	-	0.29** (0.13)
R ²	0.71	0.35	0.43	0.27	0.86
Number of firms	56	51	57	53	59

a) One star indicates 10 per cent significance.
Two stars indicate 5 per cent significance.
Three stars indicate 1 per cent significance.

Source: Own calculations.

Table 10 repeats the same regressions, excluding STOCKS and SPWW and including industry, location and ownership dummies. We find again that the coefficient on ALEFF is significantly negative in all years except 1985. WKQ is signed positively in three years, but is only significant in 1985 and 1992. This result is interesting, as one would expect that the lack of working capital makes itself felt most urgently in years of economic recession when retained profits are low. 1985 and 1992 were boom years, however. It may be that we are measuring a wrong causality here. Below, we experiment with lagging WKQ one year in a pooled regression for 1990-1992. DEFVA is only significant in 1992. At the same time, the industry dummies lose significance over time. Hence our results do confirm that relative price shifts have led to an equalisation of profit margins across sectors. Nonetheless, as noted above, entry by new producers into high profit sectors, particularly in the consumer goods industry, was probably more important. The locational dummies are not significant, except for EDZ in 1990 which is positive. Market conditions are obviously not different enough between the four coastal cities to induce differences in profitability. Finally, the SOE dummy is not significant as expected, while WFOs improve their relative profitability over time. WFOs are the most recent entrants into the Chinese industrial sector, this again confirms the role of competition in eroding monopoly profits of SOEs in our sample.

Overall, the results in Tables 9 and 10 are not very good. The only variable that is consistently significant is ALEFF which, as noted, is the case almost by implication. Particularly in 1985, 1990 and 1991 the model is very likely misspecified due to the exclusion of variables, such as unmeasurable differences in the quality of technology or worker effort. Another possible explanation for the paucity of our results is that the differentiated impact of government regulations still influences the profitability of enterprises in China, be they privately or publicly owned. The last task thus was to analyse the effect of enterprise autonomy and worker incentives on profitability.

To explore the effects of worker incentives and management form on profitability a pooled model was run from 1990 through 1992. Pooling over time was necessary in order to have a clear direction of causality, as worker incentives and the choice of the management form also depend on enterprise performance in the past. The additional variables included were the share of bonuses in the total wage bill (STW) and the share of retained profit in total profit (PROPRE). Because bonuses and retained profits in each period depend on realised profit in the same period, both variables were instrumented by one year lags. We also included two management form dummies. DMA1 comprises all firms on contract responsibility systems, DMA2 is set to unity for all firms

operating under the director responsibility system. As described in detail by Hay et al. (1994), the latter system provides for higher incentives for profit maximisation by enterprise managers. The contract responsibility system is likely to apply only to SOEs and COEs. All other firms do not generally enter into fiscal contracts with supervising authorities. We expect DMA1 firms to have lower than average profitability. DMA2, by contrast, should be positively signed.

The model was run with these additional parameters and the five variables included in Table 9. F-tests for structural stability revealed a significant structural break only for the coefficient on WKQ. When this variable was excluded structural breaks were rejected ($F=1.10$ with significance of 36 per cent). The model was thus run including slope dummies for 1990 and 1991 on WKQ. As shown in Table 11, bonuses in the previous year have a positive impact on profit margins, although this is only significant at the 20 per cent level. Retained profits have no impact on profitability. This surprising result is probably due to the little cross-sectoral variation in this variable. Studies using longer panels have usually found a positive impact of retained profits on profit margins (e.g. Hong and McMillan, 1994).

In a second run, STOCKS and SPWW were excluded as before. PROPRES was also dropped as it remained insignificant. Moreover, WKQ was instrumented by its one year lag to take account of the reverse causality problem mentioned above. This greatly improves the results as the right column of Table 11 reveals. STW is now highly significant and DMA1 has the expected negative sign. All other variables are also signed correctly. We may thus conclude at this stage that worker incentives have a positive impact on enterprise profitability, a result that confirms with a host of previous studies (Chetty, Ratha and Singh, 1993; Groves et al., 1994; Hay et al., 1994; Hong and McMillan, 1994). Manager autonomy also seems to increase profit margins which should lend support to the current direction of industrial reform.

Table 11 - Worker Incentives and Profit Margins, 1990-92

Independent variables	Dependent Variables:	
		Independent variables
Constant	-0.11 (0.13)	Constant -0.03 (0.04)
ALEFF	-0.15* (0.08)	ALEFF -0.08*** (0.01)
DEFVA	-0.10 (0.06)	DEFVA -0.11 (0.07)
WKQ	0.13*** (0.04)	WKQ(1) 0.06 (0.06)
WKQ90	-0.11* (0.06)	STW(1) 0.26*** (0.09)
WKQ91	-0.07 (0.04)	DMA1 -0.06* (0.03)
SPWW	-0.07 (0.09)	DMA2 0.02 (0.05)
STOCKS	0.14 (0.15)	
STW(1)	0.12 (0.10)	
PROPRE(1)	0.02 (0.06)	
DMA1	0.004 (0.04)	
DMA2	0.04 (0.08)	
R ²	0.53	0.38
Number of firms	43	89
One star indicates 10 per cent significance level. Two stars indicate 5 per cent significance level. Three stars indicate 1 per cent level.		

Source: Sample Survey data, own calculations.

V. Conclusions

This paper has examined the opposing movements of industrial output growth and profitability in China. Thereby we have focused on the debate between those that see falling profits as a sign for increasing allocative inefficiencies in Chinese SOEs and those that explain falling profits in the industrial sector with relative price shifts and the erosion of monopoly profits by the entry of NSFs. The evidence in this paper overall supports the second view. Thus, based on sample survey data, we could not find evidence for allocative inefficiencies in Chinese SOEs. While labour shares in the public sector have increased in the course of the 1980s, by 1992 they were not significantly higher than labour shares in NSFs and were still substantially below estimated output elasticities of labour.

An examination of other determinants of industrial profitability puts the strongest weight on the impact of changing market structure. Here, the entry of NSFs into previously protected markets has significantly lowered profitability in SOEs both on a sectoral and provincial level. The impact of relative price changes, on the other hand is less clear cut. By 1992 the effects of price controls and administrative interventions on sectoral profitability rates were probably still substantial. At the level of individual enterprises we further found support for the positive effect of worker incentives and management autonomy on enterprise profits. Firms under the contract responsibility system, requiring repeated negotiations with supervisory authorities, had lower profits than firms under direct management responsibility. Clearly, thus, the Chinese industrial reforms emphasising management accountability have gone in the right direction and some degree of internal corporate governance has been established even in SOEs.

Nonetheless, a number of caveats are in order. First, our sample results give only weak support for an improvement of total factor productivity in SOEs. Accounting for allocative efficiency improvements, the rate of technical progress was probably close to zero in the SOEs in our sample. Moreover, in spite of the concentration of public investment and bank credit on the SOE sector, COEs and TVEs are rapidly closing the efficiency gap of earlier years. In this respect, improving the allocation of capital in China and closing those SOEs with a largely outdated capital stock would seem to merit high reform priority.

Second, although we did not find allocative inefficiency in the enterprise sample overall, in some firms labour shares have exceeded output elasticities of labour. As our micro-economic analysis revealed, this did have a significant

depressing effect on their profitability. This result in itself is not surprising and would be corroborated in developed market economies. The danger in China is that the ensuing losses are shouldered by the central government or the banking system in the form of explicit or implicit subsidies. In this respect there is an awkward contradiction between the positive incentive effects of bonus payments on enterprise profitability and the negative effect of rising labour shares. However, the latter result is driven more by the failure of loss-makers to reduce employment sufficiently in response to a demand shock (see also Perkins and Raiser, 1994) than by excessive bonus payments which are directly linked to current profits. The high share of in kind transfers and welfare benefits in workers' incomes in SOEs, which could not be accurately measured in this paper, further aggravates the consequences of overemployment. As the case of the textiles industry shows, adjustment to changing market conditions is still a highly inertial process in China.

Third, our sample data were collected in four coastal cities that belong to the most developed regions in China where reforms have gone furthest. SOEs in the inner provinces, more directly dependent on central government transfers may well exhibit rather different behavioural patterns. An analysis of soft budget constraints for SOEs in different regions of China remains a task for future research. This would allow a more accurate verification of the negative impact of soft budget constraints on enterprise behaviour. The fact that we could not identify significant behavioural differences between SOEs and NSFs in terms of their allocative efficiency suggests, however, that privatisation of SOEs may not be a necessary precondition for future efficiency improvements.

The general policy conclusion that may be derived from the analysis is that declining profitability is indeed inevitable to some extent in the course of transition and not necessarily related to allocative inefficiency. At the same time, the policy focus should turn to those enterprises that are actually loss-making. In these firms, particularly in the public sector, the institutional imperfections in transition economies may ensue in a vicious circle of progressive decapitalisation through overemployment and through the burden of welfare payments to employees in the absence of an adequate social security system. As the share of loss-making SOEs in China's industrial sector is growing, a solution to this problem may be paramount to preventing increasing macro-economic instability.

References:

- Beck, Martin and Armin Bohnet (1989), "Productivity Change in Chinese Industry 1953-1985: Some further Estimations". Working Paper, Fachbereich Wirtschaftswissenschaften, Justus-Liebig-Universität, Gießen.
- Bell, Michael, Kalpana Kochhar (1992), "China: An Evolving Market Economy - Review of Reform Experiences". Working Paper No. 89, November 1992, International Monetary Fund, Washington, D.C.
- Bruno, Michael (1992), Stabilisation and Reform in Eastern Europe - a Preliminary Evaluation. IMF Working Paper No 30/92, Washington.
- Buch, Claudia M., Norbert Funke, Ralph Heinrich, Martin Raiser (et al. 1994), Overcoming Obstacles to Successful Reforms in Economies in Transition. Kieler Studie 261, Tübingen.
- Byrd, William, Quingsong Lin (1990), Chinas Rural Industry. Structure, Development and Reform. Published for the World Bank by Oxford University Press, New York.
- Calvo, Guillermo, Fabrizio Coricelli (1992), "Stagflationary Effects of Stabilisation Programmes in Reforming Socialist Economies, Enterprise-Side vs. Household-Side Factors". World Bank Economic Review, Vol. 6, No. 1, pp. 71-90.
- Chai, Joseph C.H. (1994), "Transition to a Market Economy: The Chinese Experience". Communist Economies and Economic Transformation, Vol. 6, No. 2, pp. 231-245.
- Chen Kuan, Hongchang Wang, Yuxin Zheng (1988), "Productivity Change in Chinese Industry: 1953-1985", Journal of Comparative Economics, Vol. 12, No. 4, pp. 570-591.
- Chetty, V.K., Dilip Ratha, I.J. Singh (1994), "Wages and Efficiency in Chinese Industry". Research Paper Series No. 30, Transition Economics Division, Policy Research Department, World Bank, Washington.
- Commander, Simon and Fabrizio Coricelli (1991), "Levels, Rates, and Sources of Inflation in Socialist Economies: A Dynamic Framework". In: Simon Commander (ed.), Managing Inflation in Socialist Economies in Transition, EDI, World Bank, Washington.
- Dernberger, Robert (1988), "Financing China's Development: Needs, Sources, and Prospects". In: Robert Dernberger and Richard Eckaus, Financing Asian Development, Vol. 2, China and India, University Press of America, Lanham and London, pp. 12-68.
- Diehl, Markus (1993), "Stabilization without Crisis? The Case of Vietnam". Working Paper, No. 578, Institute of World Economics, Kiel.

- Diehl, Markus (1994), "Real Adjustment in The Economic Transformation Process: The Industrial Sector of Vietnam 1986-1992". Kiel Working Paper No. 597, Kiel Institute of World Economics.
- Fukasaku, Kiichiro, David Wall (1993), "China's Long March to an Open Economy". Paper presented at the East West Centre/OECD Seminar: From Reform to Growth: Countries in Transition Compared, December 16-17, Honolulu, Hawaii.
- Groves, Theodore, Jong-Miao Hong, John McMillan, Barry Naughton (1994), "Autonomy and Incentives in Chinese State Enterprises". *Quarterly Journal of Economics*, Vol. 109, No. 1, pp. 183-109-
- Hansen, Gerd (1994), *Quantitative Wirtschaftsforschung*, München.
- Hare, Paul, Gordon Hughes (1992), "Industrial Policy and Restructuring in Eastern Europe". *Oxford Review of Economic Policy*, Vol. 8, No. 1, pp. 82-104.
- Hay, Donald, Derek Morris, Guy Liu, Shujie Yao (1994), *Economic Reform and State-Owned Enterprises in China, 1979-1987*, Clarendon Press, Oxford.
- Hong, Yongmiao, John McMillan (1994), "The Firm as an Incentive System: Evidence from China's State Firms". Cornell University and University of California, San Diego, mimeo, August, 1994.
- Hussain, Athar (1990), "The Chinese Enterprise Reforms". China Programme Paper No. 5, Development Economics Research Programme, London School of Economics.
- International Monetary Fund (1993), "China, on the Threshold of a Market Economy". Michael Bell and Kalpana Kochhar, Occasional Paper No. 107, September 1993.
- Jefferson, Gary and Thomas Rawski (1994), "How Industrial Reforms Worked in China: The Role of Innovation, Competition and Property Rights". Paper presented at the World Bank Annual Conference on Development Economics, Washington, D.C., April 28-29, 1994.
- Jefferson, Gary and Wenyi Xu (1991), "The Impact of Reform on Socialist Enterprises in Transition: Structure, Conduct, and Performance in Chinese Industry". *Journal of Comparative Economics*, Vol. 15, No. 1, pp. 45-64.
- Jefferson, Gary, Thomas Rawski (1992), "A Theory of Economic Reforms". Research Paper Series No. 25, Socialist Economic Reform Unit, The World Bank, Washington, D.C.
- Jefferson, Gary, Thomas Rawski, Yuxin Zheng (1992), "Growth, Efficiency, and Convergence in China's State and Collective Industry". *Economic Development and Cultural Change*, Vol. 40, No. 2, pp. 239-266.

- Kalirajan, K.P., Cao Yong (1993), "Can Chinese State Enterprises Perform Like Market Entities: Productive Efficiency in the Chinese Iron and Steel Industry". *Applied Economics*, Vol. 25, No. 8, pp. 1071-1080.
- Kornai, János (1986), "The Hungarian Reform Process: Visions, Hopes, and Realities". *Journal of Economic Literature*, Vol. 24, No. 4, pp. 1657-1734.
- Kornai, János (1993), "The Evolution of Financial Discipline under the Postsocialist System". *Kyklos*, Vol. 39, No. 3, pp. 315-336.
- Lau, Kam-Tim and Josef C. Brada (1990), "Technical Progress and Technical Efficiency in Chinese Industrial Growth: A Frontier-Production Function Approach". *China Economic Review*, Vol. 1, No. 2, pp. 113-124.
- Li, Yungi (1991), "Change in China's Monetary Policy". *Asian Survey*, Vol. 31, No. 5 (May), pp. 422-433.
- Lingle, Christopher and Kurt Wickman (1994), "Ist die chinesische Wirtschaft ein Papiertiger?" *Europa Archiv*, Vol. 2, No. 7, pp. 187-194.
- McKinnon, Ronald (1991), *The Order of Economic Liberalisation. Financial Control in Transition to a Market Economy*. Baltimore.
- McMillan, John and Barry Naughton (1994), "Evaluating the Dual-Trade System". Forthcoming in Dong Fureng, Cyril Lin and Barry Naughton (eds.), *Reform of China's State-owned Enterprises*, London.
- McMillan, John, Barry Naughton (1992), "How to Reform a Planned Economy: Lessons from China". *Oxford Review of Economic Policy*, Vol. 8, No. 1, pp. 130-143.
- Naughton, Barry (1993), "Why Has Chinese Economic Reform Succeeded?: Reform Strategy and External Conditions?". Paper presented at the East-West Center/OECD Seminar: From Reform to Growth: Countries in Transition Compared, 16.-17.12.1993, Honolulu.
- Perkins, Frances C., Martin Raiser (1994), "Enterprise Reform and Macroeconomic Stability in Transition Economies", Kiel Working Paper No. 665, Kiel Institute of World Economics.
- Perkins, Frances C., Yuxin Zheng (1994), "Export Performance and Enterprise Reform in China's Coastal Provinces". National Centre for Development Studies, Australian National University, mimeo.
- Perkins, Frances C., Yuxing Zheng, Cao Yong (1993), "The Impact of Economic Reform on Productivity Growth in Chinese Industry: A Case Study of Xiamen Special Economic Zone". *Asian Economic Journal*, Vol. 7, No. 2, pp. 107-146.
- Raiser, Martin (1993), "Searching for the Hole in the Public Pocket. The Institutional Legacy of Soft Budget Constraints and the Polish Transformation Process". *Economic Systems*, Vol. 17, No. 4, pp. 251-278.

- Rawski, Thomas (1993), "How Fast has Chinese Industry Grown?". Working Paper No. 1194, Transition and Macro-Adjustment Division, Policy Research Department, World Bank, Washington.
- Rostowski, Jacek (1994), "Inter-enterprise Arrears in Post Communist Economies". Working Paper No. 94, International Monetary Fund, 1994.
- Sachs, Jeffrey, Wing-Thye Woo (1994), "Structural Factors in the Economic Reforms of China, Eastern Europe and the Former Soviet Union". *Economic Policy*, Vol. 9, No. 1, pp.
- Schmieding, Holger (1993), "From Plan to Market: On the Nature of the Transformation Crisis". *Review of World Economics*, Vol. 129, No. 1, pp. 216–253.
- Siebert, Horst (1991), "The Transformation of Eastern Europe". Institute of World Economics, Kiel, Discussion Paper No. 163.
- Tidrick, Gene (1986), "Productivity Growth and Technological Change in Chinese Industry". World Bank Staff Working Papers No. 761, Washington.
- Van Long, Ngo and Horst Siebert (1991), "A Model of the Socialist Firm in Transition to a Market Economy". *Journal of Economics*, Vol. 56, No. 1, pp. 1-21.
- Woo, Wing-Tye, Wen Hai, Yibiao Jin, Gang Fan (1994), "How Successful has Chinese Enterprise Reform Been? Pitfalls in Opposite Biases and Focus." *Journal of Comparative Economics*, Vol. 18, No. 2, pp. 410-437.
- World Bank (1985), *China: Long-Term Issues and Options*. Baltimore and Washington.
- World Bank (1994a), *China: Foreign Trade Reform. A World Bank Country Study*, Washington, D.C., February 1994.
- World Bank (1994b), *China: Country Economic Memorandum, Macroeconomic Stability in a Decentralised Economy*. China Mongolia Department, Washington.
- Xiao, Geng (1990), "The Impact of Property Rights Structure on Productivity, Capital Allocation and Labour Income in Chinese State and Collective Enterprises". Research Paper Series No. 24, Socialist Economies Reform Unit, Country Economics Department, World Bank.
- Zheng, Yuxin (1994), "Improvement of Productivity and Deterioration of Profitability in China's Industry in Transition". Institute of Quantitative and Technical Economics, Chinese Academy of Social Sciences, Beijing, mimeo.