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THE STATE OWNED ENTERPRISE REFORM IN VIETNAM: PROCESS AND ACHIEVEMENTS

Abstract

This paper reviews and empirically assesses the SOE (state-owned enterprise) reform process along with the general economic reform in Vietnam for the 1976-98 period. It concludes that reform measures appear to have had positive effects on enhancing the SOE economic performance. This is reflected by an average annual TFP (total factor productivity) growth rate of 3.05 per cent over the whole period studied and of 4.22 and 5.37 per cent during the partial and full reform periods, respectively. For the entire study period, TFP accounts, on average, for 40.9 per cent of the change in industrial SOE output. In spite of these achievements, many problems remain, which need to be addressed for the on-going SOE reform process in Vietnam.

1. Introduction

With the launch of drastic and comprehensive economic reforms at the end of the 1980s, Vietnam has been able to achieve a relatively high rate of economic growth over the last decade. The annual growth rate of the Gross Domestic Product (GDP) averages 7.6 per cent for the 1991-2000 period. Adding to this impressive result is a remarkable annual growth rate of industrial output of 13.7 per cent in the industrial sector, in which State-owned enterprises (SOEs) record a rate of 12.3 per cent, and account for nearly half of the industrial output during the period (GSO 1999, 2000). The importance of the industrial SOE sector in the Vietnamese economy makes it the central focus of economic reforms, and particularly so since SOEs are perceived to be relatively inefficient. This explains for the various rounds of reform that this economic sector has undergone in the last two decades.

The process of SOE reform in Vietnam first started in the early 1980s, in which reform measures were confined to a number of moderate changes in the management and planning mechanism of the SOE sector. This partial reform, in spite of certain notable successes, was undertaken within the framework of the centrally planned economy (CPE) and thus did not comprehensively and thoroughly address the inherent

problems of the SOE sector, which later contributed to an economic crisis in the country in the mid 1980s. The economic crisis forced the government to officially abandon the centrally planned economic model in favour of a market-based one in 1986. The adoption of the new economic model ignited wide-ranging reforms in different areas, including the SOE sector from the end of that decade. Since then, the SOE reform process has focused on abolishing the centrally planned economic management mechanism, building a new system of market-based institutions and corporate governance, providing greater autonomy and incentives, and diversifying SOE ownership. These reform measures have recorded some encouraging achievements, evidenced by the growth rates in the value of production and exports. Despite these undeniable successes, many problems, however, remain as the SOE sector is largely inefficient and uncompetitive. Many SOEs appear to be making losses and their number is on the rise, especially in the last few years. These problems are becoming even more acute as Vietnam has committed to and is in the process of integrating itself into the regional as well as the world economy. The Vietnamese government is confronted with the challenge of how best to continue with the SOE reform process.

This paper focuses on the reform of the SOE sector in Vietnam at different stages of its development and provides an empirical assessment of the whole reform process. It begins with an overview of the reform process of SOEs in Vietnam, followed by a presentation of the data used for an empirical assessment of the reform process and its results. The next sections show the results of the sensitivity tests and the last section concludes.

2. The Reform Process of the SOE Sector in Vietnam

After the war against French ended in 1954, the SOE sector in Vietnam was quickly established by both nationalising the existing privately owned enterprises and building new SOEs.¹ Given the existing backward state of its agrarian economy, the Vietnamese leaders argued that the SOE sector should be constructed using the Soviet Union economic model, as this model, at that time, was perceived to be the quickest way to develop the economy. As a result of this development strategy, by the end of 1960, 100 per cent of industrial establishments, 99.4 per cent of commercial

establishments, and 99 per cent of transportation facilities, which once belonged to foreign and Vietnamese capitalists, were nationalised and transformed into SOEs. On the other hand, in the first five-year plan (FYP) 1961-65, the government spent, on average, 61.2 per cent of total budget expenditure for capital formation in the SOE sector. That was further increased to 90 per cent of the budget for the 1965-68 period (Tran Hoang Kim and Le Thu 1992). In their operation, SOEs were under direct control and management of line ministries of the central government or different departments of the local government. They were seen as the production units only and had no role in deciding what, how and for whom to produce. Their only task was to receive and carry out plans formulated up by the various ministries and departments above, which specified detailed production targets (along with various other compulsory targets), sources of inputs and output disposal. Operating profits, which was also pre-determined in the plan, needed to be transferred to the government budget and losses were made up from government budget expenditure.

Generous investment in the SOE sector during this period brought about impressive economic results. For the first five-year plan 1961-65, the year-on-year average growth rate of gross output value was 13.6 per cent for all industrial SOEs; 19.3 per cent for heavy industrial SOEs and 10.4 per cent for light industrial SOEs. The high rate of growth of industrial production during the first five-year plan, however, had masked the underlying defects of Vietnamese industrial SOEs: inefficiency and dependence on foreign aid. The practice of hoarding inputs or self-production of necessary inputs was not an uncommon phenomenon among SOEs in the context of the lack or late delivery of materials and the rigidity of the centrally planned mechanism which prevented SOEs from obtaining materials from non-official sources. In addition, SOEs often overused allocated inputs because the assessment criteria were based on the level of fulfilling the plan.

After the unification of North and South Vietnam in 1975, Vietnam embarked on developing the entire country. To implement the strategy mapped out in the second five-year plan, which focused again on developing the industrial SOE sector, significant investment was given to industrial SOEs. In fact, 21.4 per cent of total investment in 1976 was spent on heavy industry and 10.5 per cent of that on light industry. In 1980, the investments increased to 29.7 and 11.5 per cent respectively

(GSO 1983). The private and public business establishments of the former administration in the South were also quickly and forcefully transformed into northern-style SOEs. By early 1978, 1500 large and small-scale capitalist enterprises, which employed 130,000 workers or 70 per cent of the workforce in private capitalist enterprises, were nationalised and converted into 650 SOEs (Nguyen Khac Vien 1980). Despite a large amount of investment in industry and the rapid expansion of the SOE sector, the second five-year plan was a total failure. None of the targets set in the second five-year plan 1976-80 were met. The growth rate of national income was only 1.7 per cent instead of the targeted 13 to 14 per cent per year. The average annual growth rate of industrial production was 1.5 percent in industrial SOEs compared to 0.6 per cent for the whole economy (see Table 1 and Appendix 3).

Table 1
Targets and actual performance for selected economic indicators of second FYP

Indicators	Measurement Unit	Plan targets	Actual performance	Actual/Targets (%)
Coal	Million tons	10	5.3	53.00
Electricity	Billion kilowatt hour	5	3.68	73.60
Cement	Thousand tons	2000	641	32.05
Steel	Thousand tons	300	62.3	20.77
Fabrics	Million metres	450	175.3	38.95
Chemical fertilisers	Thousand tons	1300	313	24.08
Paper	Thousand tons	130	46.8	36.00

Sources: Vo Nhan Tri (1987)

The threat of economic collapse forced the Vietnamese government to reconsider the merits of the economic strategy it was pursuing. At the Fifth Plenum of the Fourth National Party Congress in July 1979, changes were made to this economic strategy for the first time. The most important decision that marked the change in economic strategy was Decree 25/CP (21 January 1981), which allowed SOEs to operate under three plans. The first plan was mandatory and was backed with assured inputs from the government. Outputs of this plan were centrally priced and must be transferred to trading SOEs. Profits under this plan must also be transferred to the State

budget. When the enterprise had surplus capacity, it could formulate a second supplementary plan. The enterprise had total freedom in acquiring inputs under the second plan but it could only produce the products specified in the first plan. Outputs of the second plan, in principle, had to be sold to trading SOEs but the enterprise could also dispose of them in free markets. A third (auxiliary) plan was non-mandatory and to be formulated by the enterprise. Under the third plan, the enterprise also had total freedom in acquiring inputs and disposing of outputs under the third plan in free markets. Profits from the second and third plans could be retained by the enterprise in a predetermined proportion.

The changes brought about by Decree 25/CP and the following policies had a strong impact on the behaviour of SOEs toward production efficiency. Short-term resource utilisation was sharply improved and outputs were increased without significant additional inputs, especially in areas sensitive to market demand and easy to source inputs (Fforde and De Vylder 1996).² There was strong development in horizontal relations among SOEs and with other non-SOEs, thus partly eliminating the chronic phenomenon of a centrally planned economy, or what is commonly known as “simultaneously abundance and shortage” for production inputs. The overall picture can be seen from Table 2 (See also Appendix 3).

Table 2
Industrial output growth

Annual rate of growth (%)	1976-80	1980-85
Total	0.6	9.5
State sector	-1.5	8.1
Of which: Central	-3.5	7.8
Local	2.9	8.6
Heavy industry	1.1	6.4
Light industry	-0.6	11.2

Sources: GSO (1985; 1987 and 1988)

In spite of having positive effects on production, reform measures in this period were partial in nature. They were carried out within the frame of a centrally planned economy with the ultimate aim to strengthen that mechanism. The main elements of a centrally planned economy were still in existence. At the same time, the newly acquired autonomy of SOEs, in the context of the dual price policy for industrial products, enabled them to engage in input trading activities in the free markets for windfall profits. Consequently, the main production plans were ignored and production inputs flew out to free markets. This practice forced many SOEs to scale down the production. The overall result was the decrease in industrial production of the SOE sector with 1983 output value equivalent to that of 1979 (Do Hoai Nam 1994:115). Lower economic activity led directly to the reduction in State budget revenue and a corresponding increase in the State budget deficit. With scarce foreign aid, the deficit was primarily financed by printing money. In 1984, the amount of money in circulation increased by 70 per cent compared with that in 1981 (Do Hoai Nam 1994-116). The consequence was high inflation since 1981.³

In an attempt to revive the economy and check inflation, a price, wage and money reform was carried out in September 1985.⁴ Although this reform addressed the right issues, it was still seen to be a failure, as it did not totally eliminate the roots of the problem. Prices were still centrally determined and SOEs were given more subsidies. These factors, along with the easy credit policy of the State banks, had encouraged SOEs to borrow heavily,⁵ which worsened the State budget deficits.⁶ The deficits, when financed by printing money, caused spiralling inflation from late 1985. In 1986 alone, price increased by nearly 800 per cent and the amount of money in circulation increased by 7.4 times (Do Hoai Nam 1994:117). Inflation was also very severe in the years that followed, with a year to year inflation rate of 454.6 per cent in 1987, 410.9 per cent in 1988, and 176 per cent in 1989 (GSO 1992:160). The negative macroeconomic impact of this hyperinflation induced the next wave of reform in the second half of the 1980s.

In December 1986, the Sixth National Congress of the Communist Party of Vietnam decided to abandon the centrally planned mechanism and to replace it with a market mechanism to develop a market-oriented economy in Vietnam. The first and most important step in realising this change in development strategy is the issuance of

decision 217/HDBT in November 1987. This decision virtually eradicated all elements of the old planning mechanism. SOEs were now given the autonomy to formulate and implement their own long-term, medium-term and short-term operating plans based on socio-economic development guidelines set by the Government. Mandatory targets were reduced to no more than three. The system whereby Government provided the inputs was abolished. Outputs outside those that formed part of the mandatory plan which previously had to be sold to designated buyers could now be sold to other trading firms or even to consumers directly. Profits were calculated based on true costs, and except for compulsory transfers to the State Budget, profits were retained by the enterprise and used at its own discretion. The price of the product was decided by bargaining with buyers in the case of non-price-controlled products. For price controlled-products, the price was set by the enterprise with reference to a price committee but the number of price-controlled products was quickly reduced.⁷

The change of economic management mechanism following decision 217/HDBT caused a large number of SOEs to experience difficulties and incur losses. At constant of 1989 price, the industrial output of the SOE sector in 1989 reduced by 2.5 per cent compared with that of 1988 and in early 1990.⁸ Some 38 per cent of SOEs were making losses. On 20 November 1991, the Council of Ministers enacted Decree 388/HDBT on the regulations for setting up and closing down of SOEs, which forced an SOE to be dissolved or merged with another if they were judged to be inefficient or lacking capital or technology or did not have sufficient market demand for their outputs. As a result, the cumulative number of SOEs dropped from 12,297 at the time of promulgation to 6264 by April 1994 and for industrial SOEs, the number reduced from 2599 to 2062. The SOE sector was further reorganised with the issuance of Decision 90 and 91 in 1994 on establishment of General Corporations, namely General Corporation 90 and 91.

In 1995, the law on SOEs was enacted, providing the first legal basis for the operation of SOEs. According to this law (and other subsequent policies), SOEs now all have legal status and are legally equal to each other. They have the rights to decide what, how and for whom to produce and where to source inputs and market their outputs. They are allowed to do business freely with each other and with non-SOEs, including foreign partners in the form of a joint venture or a business contract. They

are also allowed to hire and fire employees and set wages, within policy guidelines. However, they have to preserve and develop the capital that government has entrusted them with and to pay taxes and other levies as stipulated in the laws. All after-tax profits belong to SOEs. They have almost total freedom to use their capital: they can invest using their own funds to increase fixed capital and dispose unnecessary fixed capital except for big projects or important equipment where approval must be sought from the finance authority. The establishing organizations, namely the Prime Minister's Office, Line Ministries and People's Committees have the right to re-organize and dissolve SOEs as well as the right to approve the business strategy and appoint the Chairman and other members of the Management Board or the General Director/Directors. These bodies now can only provide technical guidelines to SOEs and could no longer interfere directly in SOE operations. Neither can the Finance Minister, who now has the responsibility of managing the State capital in SOEs.

The bold SOE reform measures in this period, accompanied by the success of macroeconomic reform,⁹ brought positive impact on the industrial SOE sector. The year-on-year growth rate of SOE industrial output value is presented in Table 3 (See also Appendix 3).

Table 3
Year-on-year growth rate of SOE industrial output value

Years	Industrial SOE output value (million <i>dong</i> at 1989 price level)	Year-on-year growth rate
1989	8932817	-
1990	9475800	6.08
1991	10599400	11.86
1992	12778900	20.56
1993	14642700	14.58
1994	16796700	14.71
1995	19081600	13.60
1996	21347975	11.88
1997	23663241	10.85
1998	25540368	7.93

Source: Calculated from Appendix 1

After achieving impressive industrial growth from the late 1980s brought about by bold reform measures, industrial SOEs in Vietnam entered a difficult phase since the mid 1990s. They had been facing more competition from private and foreign invested firms in Vietnam, especially after the Asian financial crisis in 1997 when imports became relatively cheaper following the currency devaluation of neighbouring countries. SOEs in general were not competitive and many of them incurred chronic losses. Statistics from Ministry of Finance shows that three fifths of SOEs were unprofitable as of the end of 1997 (World Bank 1998). For 1999, only 40 per cent of SOEs can make profits (Lao Dong newspaper 23 May 2000). According to a report by Ministry of Finance (Vietnam Economic Times: Number 12-1999), the ratio of profits to total capital decreased continuously from 1995 to 1997 for the SOE sector. Table 4 presents a few examples.

Table 4
Profits capital ratio of the SOE sector

Province	1995	1996	1997
Ho Chi Minh city	19%	18%	15%
Haiphong	11%	6%	5%
Danang	14%	13%	12%
Vung Tau	18%	16%	12%
Hai Duong	20%	11%	8%

Source: Vietnam Economic Times (12-1999)

Note: Profits used here are net profits

SOE reform measures in this period, however, showed mixed signals. On one hand, the government was determined to downsize the SOE sector by divestiture of SOE ownership including equitisation.¹⁰ In September 1999, the government issued Decree 103/ ND-CP on the ‘Sale, Contracting out and Leasing’ of small SOEs. The government also stated that it wants to reduce the number of SOEs to 3000 by 2003 and to 2000 by 2005 (Lao Dong newspaper 23 May 2000). On the other hand, subsidies were again given to loss making SOEs or SOEs having difficulties in the form of direct grant, postponement of taxes, rolling-over or writing-off of the bad debts. According to Vietnam Economic Times (64-2000), for three years from 1997 to 1999, State budget directly financed the SOE sector with nearly 8000 billion Vietnamese *dong*. SOEs

were also exempted from paying taxes amounting to 2288 billion Vietnamese *dong* and their bad debts estimated to be 1088 billion Vietnamese *dong* were written off. These made the amount that SOEs received from State budget greater than the amount they contributed to it.

3. The data

Besides aggregate indicators like the growth rate of gross output and the proportion of loss-making SOEs, one common method to assess the general impact of reform measures in the SOE sector is to analyse the change in total factor productivity (TFP) growth of the sector over the reform period. Ideally, the calculation of TFP growth requires panel data extending over the period under study. Unfortunately, obtaining appropriate panel data on SOEs in Vietnam is an almost impossible task because of the lack of cross-sectional data in initial stages of the reform period. Confronted with this problem, an indirect method is utilised whereby TFP growth rates are calculated using aggregate data on gross output, labour, capital and intermediate inputs of industrial SOEs in Vietnam over the 1976-98 period; and the share of capital, labour and intermediate inputs in gross output.

The aggregate data was compiled using statistical yearbooks of various years, published by General Statistical Office (GSO) of Vietnam, and other sources. The variable, “gross value of industrial output”, for industrial SOEs (both central and local SOEs) is taken directly from statistical yearbooks. The statistical yearbooks give the annual value of this variable in both current prices and fixed prices relative to a base year. For the 1976-98 period, there are three base years: 1982, 1989 and 1994. For consistency of the analysis, all the aggregate data are converted into million *dong* of fixed prices of 1989. The variable, “labour,” is also directly taken from statistical yearbooks. However, in the analysis, this variable only includes the number of workers directly involved in production and is measured in thousands of people. This is to distinguish it from the variable, “total employees”, which also includes workers indirectly involved. The variable, “intermediate inputs,” is calculated as a proportion of the gross value of industrial output. This proportion varies from year to year and is taken from the statistical yearbooks for all the years before 1991. For the six years: 1991, 1993, 1995-98, the proportion is calculated based on the data from two surveys¹¹

by dividing the value of intermediate inputs, which include the main inputs, electricity, fuel and water and a few other items, to gross value of output. The results for 1992 and 1994 were approximated by taking the average value of the proportion of two adjacent years.

The variable, “capital”, used in this analysis, is the net value of fixed capital, i.e., the original value after accounting for depreciation. To obtain this variable, it is necessary to ascertain the level of fixed capital at the beginning of the year ($K_{beginning}$) or the level of fixed capital at the end of previous year (K_{end}); and the increase ($K_{increase}$) or decrease ($K_{decrease}$) in fixed capital during the year.¹² The fixed capital level in each year is then calculated using the formula:¹³

$$K_{end} = K_{beginning} + K_{increase} - K_{decrease} \quad (1)$$

Statistical yearbooks give the total investment in fixed capital in industrial SOEs for the years 1985 to 1998. Investment in the remaining years was calculated by an indirect method. Given the information about the growth rate of investment in fixed capital in industrial SOEs from 1977 to 1990 (Tran Hoang Kim 1992), investment for the years from 1976 to 1984 was then estimated (at 1982 prices). These investment values, however, cannot be used to calculate the increase in fixed capital in that year because investment is normally spread over a number of years. There was, nevertheless, information available about the increase in fixed capital in industrial SOEs for the years from 1995 to 1998. These values were then used to calculate the value of fixed capital in those years. For the other years, the increase in fixed capital was found by multiplying total investment in that year by the ratio of the increase in fixed capital in that year to total investment. This ratio is available for 1980 and from 1985 to 1990. For the years 1976 to 1979 and 1981 to 1984, this ratio is approximated by dividing the value of the increase in fixed capital in the material productive sector (dominated by industry) by total investment in that sector in that year. For the remaining years from 1991 to 1994, the increase in fixed capital of industrial SOEs was approximated by multiplying the increase in total fixed capital in the industry by the share of output of industrial SOEs in total industrial output. The values of the increase in fixed capital

from 1976 to 1998 found above were then converted into the same base year prices of 1989.

The depreciation rate was calculated using the data from the Ministry of Finance survey, which gave an estimate of 6 per cent per year.¹⁴ Given the value of fixed capital in 1976 (the first year of the study period), is not available, the net value of fixed assets used in industrial SOEs at the beginning of 1990 is used instead.¹⁵ This is the value of the capital stock of the beginning of 1990. This value is then deflated into million *dong* at 1989 prices by multiplying it with the deflator between 1989 and 1990, which is 0.7937, and then by 1000. Using this new figure and the increase in fixed capital calculated earlier, together with the depreciation rate of 6 per cent, the fixed capital level of all other years is found with a trivial algebraic manipulation. A summary of these aggregate data is shown in Table 5 and Figure 1 and the details are given in appendix 1.

Table 5
Summary of the aggregate data, 1976-98

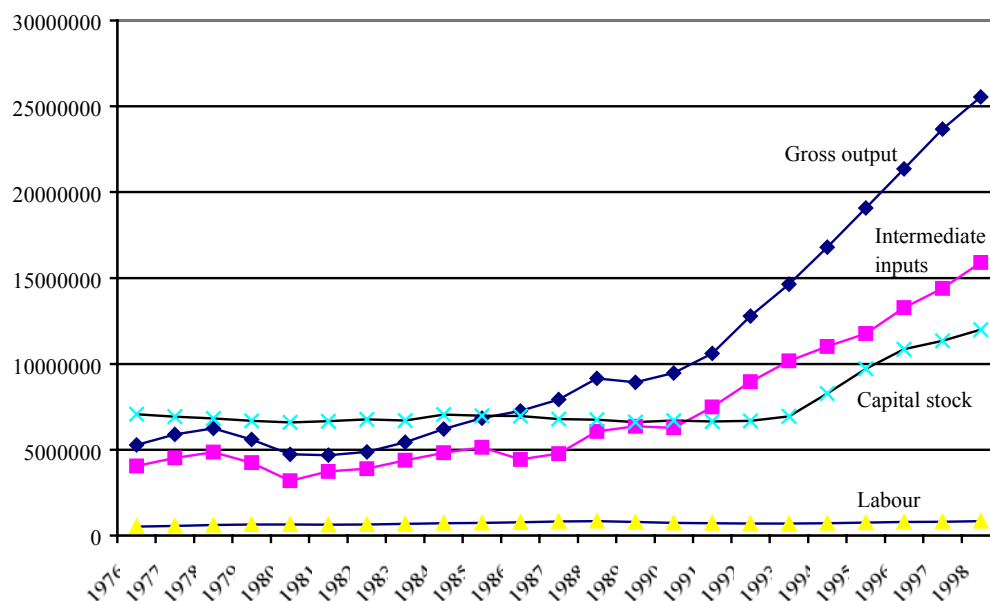
Variables	Measurement Unit	Average Value
Gross output	Million <i>dong</i> at 1989 prices	10,564,496.065
Intermediate Inputs	Million <i>dong</i> at 1989 prices	7,118,633.498
Labour	Thousand people	713.578
Fixed Capital Stock	Million <i>dong</i> at 1989 prices	7,586,656.201

Sources: GSO, CIEM and MOF surveys, and author's calculation.

The share of capital, labour and intermediate inputs are calculated using detailed data from the Ministry of Finance survey. The following variables were extracted from the database for 1997 and 1998. For consistency, all data were converted to the 1997 prices.

1. Stock of products at the beginning of the year
2. Stock of products at the end of the year
3. Total sales during the year
4. Remaining value of fixed capital for each year
5. Average number of direct workers in each year
6. Number of excess direct workers in each year
7. Direct expenditure on main inputs
8. Expenditure on electricity, fuel, water and telephones.

Figure 1 Aggregate data of industrial SOEs in Vietnam for the 1976-98 period



The value of output produced in the year was calculated by adding the stock of products at the end of the year to sales during the year and subtracting the stock of products at the beginning of the year.¹⁶ Labour was measured in terms of the number of workers and was found by subtracting the number of excess direct workers from the average number of direct workers employed during the year.¹⁷ Total inputs were derived by adding expenditure on the main inputs (item 7) to other expenditure (item 8). The average value of these variables is shown in Table 6.

Table 6
Average value of variables, 1997-98

Variable	Measurement unit	1997	1998
Gross output	Million of <i>dong</i>	80,380.88	91,231.04
Fixed capital	Million of <i>dong</i>	26,377.65	27,525.45
Labour	Number of people	857	868
Intermediate inputs	Million of <i>dong</i>	45,131.46	50,488.51

Source: The Ministry of Finance survey

4. Empirical results

To estimate the share of capital, labour and intermediate inputs in gross output, Cobb-Douglas and Translog production functions were regressed with the data available. Regression results show that the Cobb-Douglas production function provides the better representation.¹⁸ The Cobb-Douglas production function has the form

$$Y_{it}(L, K, M) = AL_{it}^{\alpha_1} K_{it}^{\alpha_2} M_{it}^{\alpha_3} + e_{it} \quad (2)$$

where $Y_{it}(L, K, M)$ is the output level of firm i produced in year t , measured in millions *dong*. $L_{it}; K_{it}; M_{it}$ are, respectively, labour, measured in number of workers who directly participated in the production process; fixed capital and intermediate inputs of firm i in year t , both measured in million *dong*, and e_{it} is the error term, assumed to follow the standard assumptions. Table 7 reports the regression results of the Cobb-Douglas production function with the 1997 and 1998 data, carried out in the following steps:¹⁹

1. Data for 1997 and 1998 were regressed separately;
2. The data for these two years were pooled and regressed;
3. Data for the two years were pooled but care was taken for possible autocorrelation and heteroskedasticity between observations of the two years and across different firms.

Table 7
Estimation of coefficients²⁰

Variables	Step 1		Step 2	Step 3
	1997 data	1998 data		
Labour (Log)	0.225* (2.945)	0.186** (2.246)	0.205* (3.640)	0.185* (16.910)
Capital (Log)	0.209* (2.697)	0.212** (2.240)	0.211* (3.460)	0.195* (22.19)
Inputs (Log)	0.499* (6.441)	0.532* (5.977)	0.516* (8.749)	0.550* (69.04)
Constant	2.206* (3.120)	2.135** (2.539)	2.162* (3.965)	2.071* (29.50)
R ²	0.6438	0.6036	0.6228	0.9813

Dependent variable is *log of gross output* and *t* values are in brackets; * and ** mean statistically significant at 1 per cent and 5 per cent respectively.

The TFP growth rate, expressed in terms of a year-to-year growth rate, for the 1976-98 period is derived using coefficients from step 1 with 1997 data and the aggregate data on gross output, fixed capital, labour and intermediate inputs.²¹ The results, which are calculated in Appendix 2, are then plotted in Figure 2 and re-calculated for different sub-periods in Table 8.

Table 8
Average TFP growth rate of industrial SOEs for the 1976-98 period

Periods	Reform development	TFP growth rate	Percent-age
1976-1981	Pre-reform	-0.0197	-1.97
1982-1986	Partial reform	0.0608	6.08
1987-1989	Failure of price, wage and money reform	0.0111	1.11
1982-1989	Whole partial reform period	0.0422	4.22
1990-1998	Full reform	0.0537	5.37
1976-1998	Whole study period	0.0305	3.05

Source: Calculated from Appendix 2

Figure 2 Year to year TFP growth of industrial SOEs for the 1976-98 period

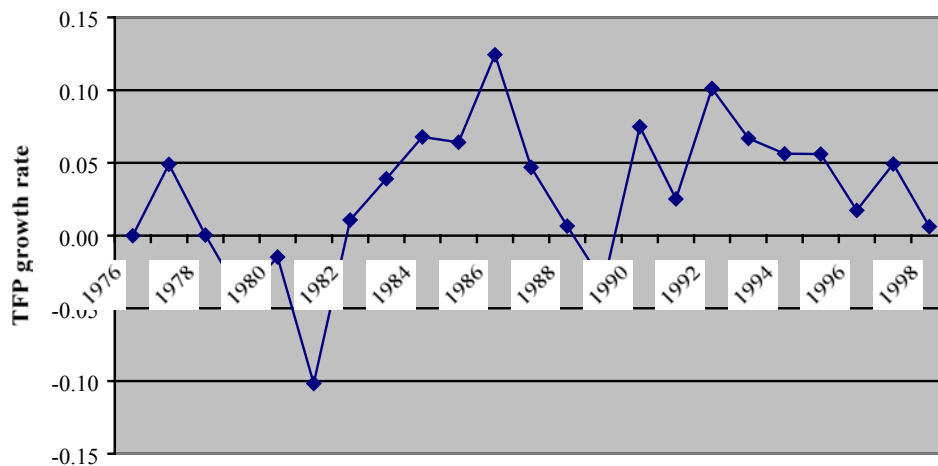


Table 8 shows the average TFP growth rate for the whole study period and different sub-periods. Over the entire study period, annual average TFP growth rate is positive at around 3.05 per cent. At the average annual growth rate of industrial SOE output of 7.45 per cent for the 1976-98 period (See Appendix 2), the TFP, therefore, accounts for 40.9 per cent of the change in the output. The TFP growth rate, however, varies from time to time and is quite distinct in the three sub-periods 1976-1981, 1982-1989 and 1990-1998. From 1976 to 1981 — the period before the full implementation of the partial reform, the TFP growth rate was negative with an average value of -1.97 per cent. After 1982, the rate became positive and it peaked in 1986, giving an average value of 4.22 per cent for the whole partial reform period 1982-89.²² However, for the last three years of that period, the TFP growth rate fell and even became negative in 1989, giving an average value for the three years of 1.11 per cent. After 1989, the TFP growth rate became positive again, achieving an average value of 5.37 per cent.

It is clear from Table 8 and Figure 2 that the upward trend in the TFP growth coincided with the reform periods in the early 1980s and 1990s. So can the positive growth rate of TFP be attributed to reform measures in these periods? It is quite probable that this is the case because all reform measures were seen to be productivity enhancing. As in previous section, before the partial reform in the early

1980s, industrial SOEs in Vietnam were operating in a highly centrally planned environment. This mechanism, widely discussed in literature, stunts productive efficiency. This is reflected in the overuse and hoarding of inputs, frequent disruption of production and low quality of products. Without management autonomy and workers being remunerated in an egalitarian manner — the direct result of the centrally planned mechanism and socialist principles — managers and workers are discouraged from using their skills and knowledge effectively. In that environment, a negative TFP growth rate was an understandable outcome.

Reform measures in the early 1980s did address the problems of the centrally planned mechanism. SOEs were given partial autonomy to decide what, how and for whom to produce. As they were responsible for production, decisions that caused losses would less likely to be chosen and product quality would be given more attention. Above all, since they were allowed to share in the profits, their attitude towards production efficiency was dramatically changed. If they did not operate efficiently, they had less chance to share in the profits. Profit sharing also encouraged workers to reveal their skills and knowledge as this would enhance productivity and hence income. It is therefore reasonable that reform measures in the early 1980s enhanced productivity as shown in Figure 2.

The downtrend in the TFP growth rate during the 1987-89 period can be attributed to the economic crisis after the failure of the price, wage and money reform in late 1985. In a highly inflationary environment, SOEs did not find it profitable to engage in production activities. Hence output growth was restricted: gross output value increased by an average of 7.42 per cent for these three years compared with 9.19 per cent in the earlier period of 1982-86, while inputs increased by 13.19 per cent — much higher than that of 3.92 per cent of the earlier period. Moreover, labour input also increased, although by less than that of the earlier period (0.41 per cent compared with 4.27 per cent). Only fixed capital declined by a very small average value of 1.73 per cent (compared with an average increase of 0.91 per cent in the earlier period). However, the positive TFP growth rate from 1990 was likely to be brought about by the radical reform measures of 1988 and 1989. Decision 217/HDBT and other measures that followed have substantially liberalised SOEs and allowed them to enjoy the after-tax profits as well as reduced the number of loss-making SOEs. Having greater

freedom in making economic decisions and enjoying the economic outcomes has enabled SOEs to make fuller use of their capabilities. This has brought about higher productivity. Nevertheless, since 1995 greater competitive pressure from other economic sectors has created difficulties for SOEs, reflected by a larger proportion of SOEs now making losses. The difficulties in SOE operation could well be the reason behind the lower TFP growth rate during this period.

5. Sensitivity tests

To confirm the results, sensitivity tests are needed in the following respects: the model specification and the coefficients used in calculating the TFP growth rate (as the above method implicitly assumes that the relevant coefficients have remained constant throughout the period). To confirm the model specification, the same data was used with an alternative “Translog” functional form for production and tests were carried out to compare the Translog and Cobb-Douglas production functions. With the Translog specification, the production function has the form given in equation 3, where K_{it} ; L_{it} ; M_{it} ; and e_{it} have the same definition as in equation 2. This specification is estimated with the data of 1997 and 1998 and the results are shown in Table 9.

$$\begin{aligned} \text{Log}Y_{it}(K, L, M) = & \alpha_1 \text{Log}K_{it} + \alpha_2 \text{Log}L_{it} + \alpha_3 \text{Log}M_{it} + \alpha_4 \frac{1}{2} (\text{Log}K_{it})^2 + \alpha_5 \frac{1}{2} (\text{Log}L_{it})^2 \\ & + \alpha_6 \frac{1}{2} (\text{Log}M_{it})^2 + \alpha_7 \text{Log}K_{it} * \text{Log}L_{it} + \alpha_8 \text{Log}K_{it} * \text{Log}M_{it} + \alpha_9 \text{Log}M_{it} * \text{Log}L_{it} + e_{it} \end{aligned} \quad (3)$$

To compare the Translog and the Cobb-Douglas specification, the F -test was carried out to see if $(\text{Log}K_{it})^2$, $(\text{Log}L_{it})^2$, $(\text{Log}M_{it})^2$, $\text{log}K_{it} * \text{Log}L_{it}$, $\text{log}K_{it} * \text{Log}M_{it}$ and $\text{log}M_{it} * \text{Log}L_{it}$ were all equal to zero. With 1997 data, the resulting F statistic is 9.954 with 6 and 154 degrees of freedom. The corresponding P -value is 0.000. Similarly, with 1998 data, the resulting F statistic is 8.287 with 6 and 154 degrees of freedom. The corresponding P -value is 0.000. Based on this result, the hypothesis that the data support the Translog production function is not rejected. However, the t -test of the hypothesis that individual coefficients equal zero shows that almost all coefficients are not statistically different from zero (Columns 4 and 7). It follows, therefore, that the

Translog function is not a good representation of production of industrial SOEs in Vietnam. The Cobb-Douglas function, therefore, is preferred.

Table 9
Regression results using the Translog production function

Variables	Estimated			Estimated		
	Coefficients	T-Ratio	P-Value	Coefficients	T-Ratio	P-Value
	(1997 data)			(1998 data)		
LogL	0.689	0.815	0.416	-0.481	-0.478	0.633
LogK	-0.815	-1.167	0.245	-0.315	-0.375	0.708
LogM	-0.311	-0.486	0.628	-0.529	-0.700	0.485
(LogL) ²	0.052	0.289	0.773	0.087	0.535	0.593
(LogK) ²	0.073	1.027	0.306	0.111	1.278	0.203
(LogM) ²	0.255*	3.046	0.003	0.253*	2.790	0.006
LogK*LogL	0.116	1.471	0.143	0.075	0.988	0.325
LogK*LogM	-0.045	-0.425	0.671	-0.108	-0.907	0.366
LogM*LogL	-0.196*	-2.684	0.008	-0.064	-0.696	0.487
Constant	9.517	1.791	0.075	12.002	1.932	0.055
R ²	0.7050			0.6638		

The dependent variable is *Log of gross output* and *t* values are in brackets; * means statistically significant at 1 per cent.

To confirm the trend of the TFP growth rate, different values for the share of capital, labour and intermediate inputs were utilised. The first option was to use the shares estimated from the same data set but with different regressions (Step 1 with 1998 data, step 2, and step 3 of Table 7). Another option was to use the corresponding shares of industrial SOEs in another country, which shares a similar economic environment as Vietnam. To motivate the second option, Table 10 shows the shares of capital, labour and intermediate inputs from three studies on SOE reform in China: JRZ, GHMN and HW.²³ Using these shares of capital, labour and intermediate inputs with aggregate data for gross output, fixed capital, labour and inputs of Vietnamese industrial SOEs for the 1976-98 period, the TFP growth rate was calculated and the results shown in Figure 3.

Table 10
Shares of capital, labour and inputs of Chinese industrial SOEs

Studies	Capital share	Labour share	Input share
JRZ	0.211	0.124	0.695
GHMN	0.3892	0.1082	0.4414
HW	0.169	0.1785	0.634

Sources: Jefferson; Rawski and Zheng (1992), Groves, Hong, McMillan and Naughton (1994) and Huang and Woo (1998).

Figure 3 TFP growth rate with different shares of capital, labour and intermediate inputs

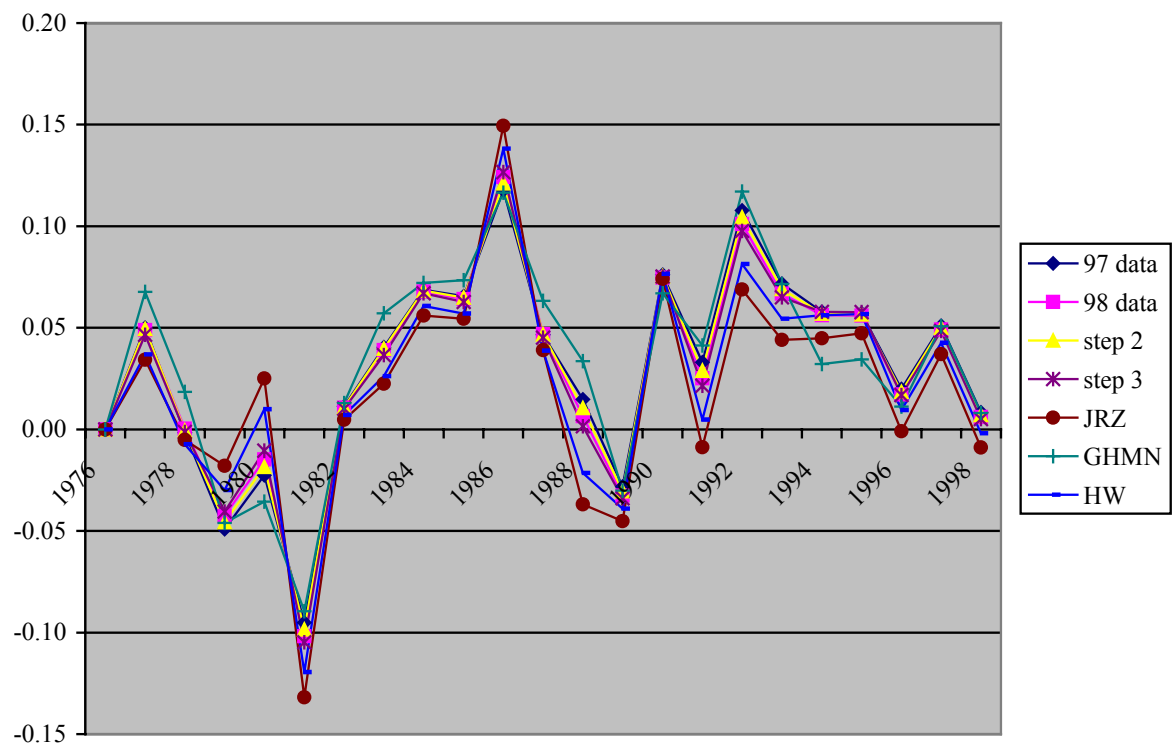


Table 11, on the other hand, shows the average TFP growth rate for the whole period as well as for different sub-periods. In spite of the different values used for the shares of capital, labour and intermediate inputs, the results in Table 11 and Figure 3 confirm the earlier findings about the TFP growth rate in Vietnamese industrial SOEs. The trend of the TFP growth rate is very consistent over the whole period and also for

the different sub-periods. TFP growth is negative before partial reform. It becomes positive but then declines in the last few years of the partial reform period. From 1990 onwards, the rate is positive again. This consistency reaffirms the earlier results that reform measures did enhance the productivity of industrial SOEs in Vietnam.

Table 11
TFP growth rate with different shares of capital, labour and inputs

Periods	1997 data	1998 data	step 3	step 5	JRZ	GH MN	HW
1976-81	-0.0197	-0.0183	-0.0190	-0.0184	-0.0159	-0.0141	-0.0183
1982-86	0.0608	0.0612	0.0610	0.0607	0.0574	0.0664	0.0579
1987-89	0.0111	0.0070	0.0089	0.0043	-0.0143	0.0223	-0.0072
1982-89	0.0422	0.0409	0.0415	0.0395	0.0305	0.0499	0.0335
1990-98	0.0537	0.0503	0.0519	0.0495	0.0331	0.0482	0.0423
1976-98	0.0305	0.0291	0.0298	0.0283	0.0194	0.0325	0.0234

Sources: Table 7, Table 10 and appendix 1.

6. Conclusion

The process of reforming industrial SOEs in Vietnam, aimed at liberalising SOEs and enhancing the incentive system, seems to have had positive effects on enhancing SOEs' economic performance. This is reflected by an average annual TFP growth rate of 3.05 per cent over the whole period studied and of 4.22 and 5.37 per cent during the partial and full reform periods, respectively. Overall, the TFP accounts for 40.9 per cent of the change in the industrial SOE output. In spite of these achievements, many problems remain to be solved. While SOEs are enjoying greater autonomy than before, their behaviour has not been effectively controlled. The weak management and controlling mechanism enables SOEs to appropriate the public property. On the other hand, the SOE sector is still seen to be less competitive and inefficient relative to private enterprises. The above issues need to be addressed for the on-going SOE reform process in Vietnam.

NOTES

1. The resolution of the Third National Congress of the Vietnam Labour Party in September 1960 wrote “In order to improve the current backward state of agriculture and transform our economy from mostly small scale production to the socialist large scale production, the only way is to carry out the socialist industrialisation by giving priority to reasonably develop heavy industry at the same time develop agriculture and light industry” (Do Hoai Nam: 1994).
2. Average annual growth rate for the 1979-82 period was 14 per cent for soap, 22 per cent for cigarettes and 33 per cent for sugar (GSO 1985B, tables 36, 40 and 41).
3. The year to year growth rate of prices on free market was 147.4 per cent in 1981, 165.0 in 1982, 157.5 per cent in 1983 and 176.3 per cent in 1984 (World Bank 1990).
4. For more details on the price, wage and money reform, see Leung and Vo (1996).
5. The interest rates for the credits given to SOEs were only one tenth of the inflation rate (Do Hoai Nam 1994-118).
6. The State banks were capitalised by money from the State budget.
7. The number of commodities under price control was reduced from 100 in 1987 to 30 in 1988, 20 in 1989 and just 8 in 1990 (Le Dang Doanh 1996-65).
8. Calculated from data in Appendix 1.
9. Inflation rate was 67.5 per cent in 1990; 67.6 per cent in 1991; 17.6 per cent in 1992; 5.2 per cent in 1993; 14.4 per cent in 1994 and 12.7 per cent in 1995 (GSO 1997).
10. Equitisation effectively means privatisation as it involves selling shares of SOEs to the public.
11. One is the survey of 200 industrial SOEs covering three years 1991, 1993 and 1995, carried out by the Central Institute for Economic Management (CIEM) in August 1996. The other is the survey of more than 200 industrial and service SOEs in three main cities; Hanoi, Haiphong and HoChiMinh covering three years 1996, 1997 and 1998, carried out by the Ministry of Finance (MOF) in April 1999. For the second survey, data of only 164 industrial SOEs were utilised in the analysis.
12. Fixed capital could be increased or decreased by the purchase or sale of machinery. This did happen but was limited to transactions with other industrial SOEs, which left total fixed capital stock unchanged within the industrial SOEs. So only new investment and depreciation of existing machinery changes the level of fixed capital stock for SOEs in aggregate.
13. This is also called the perpetual-inventory method.
14. This is close to the value used in a study by the Centre for International Economics (CIE) of 5 per cent for the whole economy (UNIDO 1996).
15. This value is taken from a revaluation of all fixed assets of industrial SOEs in Vietnam on January, 1 1990 and equals 8445.7 billion *dong* at 1990 prices (Tran Hoang Kim, Le Thu 1992-107).
16. The stock of products at the beginning and the end of a year is measured in terms of the cost at the factory gate (million Vietnamese *dong*). Total sales are measured in both retail prices and the cost at the factory gate (million Vietnamese *dong*). To ensure consistency, the latter value is chosen.
17. To a large extent, we consider all workers to be homogenous as they work the same number of hours (8 hours) 6 days a week. Of course, this is only an approximation.
18. See section 5 for the sensitivity test on the functional form of the production function.
19. Appropriate tests show that heteroskedasticity was present in all regressions. The results reported here are from regressions after heteroskedasticity has been corrected.
20. For the hypothesis that each coefficient equals zero, all *t* - tests reject that hypothesis at the 5 per cent significance level in all regression steps. Similarly, the *F* test for the

hypothesis that all response coefficients are at the same time equal to zero indicates that this hypothesis is rejected in all regressions since the p-value is 0 in all regression steps.

21. Coefficients from 1997 data are better for TFP calculation compared with these from 1998 data since the Asian financial crisis started to impact industrial SOEs in Vietnam since the beginning of 1998.
22. The full reform period is seen to start from 1989. However, full implementation of major reform measures did not finish until 1990. The year 1989, therefore, is counted in the partial reform period in TFP calculation.
23. JRZ is a study by Jefferson; Rawski and Zheng (1992) on TFP growth of industrial SOEs in China for the 1980-88 period. The shares of capital, labour and intermediate inputs were estimated using data of 382 industrial SOEs in 1987. GHMN is a study by Groves, Hong, McMillan and Naughton (1994) on autonomy and incentives in Chinese State enterprises. The authors used the panel data for 437 industrial firms in textiles, chemicals, building materials, machinery and electronics for the 1980-89 period. The shares of capital, labour and intermediate input are the average values of the corresponding shares in these five sub-industries. HW is a study by Huang and Woo (1998) on autonomy and incentives in Chinese State enterprises. The authors used the panel data for 421 firms in food processing, textiles, chemicals, building materials, machinery and electronics for the 1980-94 period. The shares of capital, labour and intermediate inputs are the average values of the corresponding shares in these six sub-industries.

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**Appendix 1: Aggregate data of industrial SOEs in Vietnam for
the 1976-98 period**

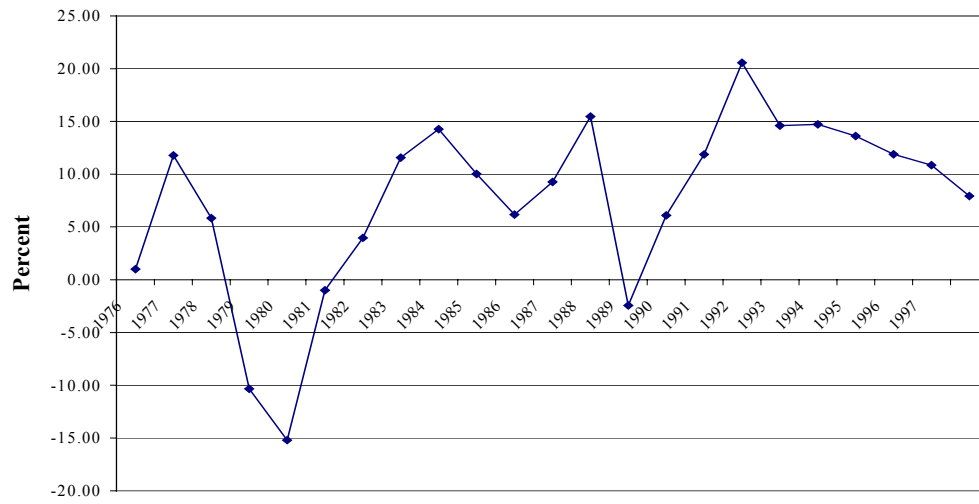
Years	Gross output	Input share	Intermediate Inputs	Workers	Fixed capital
	Million <i>dong</i>	Percentage	Million <i>dong</i>	People	Million <i>dong</i>
1976	5269298.884	76.92	4053144.702	519200	7059295.603
1977	5890018.882	76.68	4516466.479	553000	6925659.261
1978	6233308.324	77.96	4859487.169	614800	6820751.391
1979	5587773.639	75.81	4236091.196	652400	6687018.085
1980	4738194.013	67.17	3182644.918	645700	6590054.010
1981	4690175.829	79.8	3742760.311	630700	6661501.507
1982	4875615.634	80	3900492.507	641100	6768519.809
1983	5438932.557	80.7	4389218.574	682400	6701656.889
1984	6214432.697	77.5	4816185.340	725500	7056262.253
1985	6837681.206	75.1	5135098.586	738000	6979332.333
1986	7259472.087	61.2	4442796.918	776500	6962080.784
1987	7931514.974	60.1	4766840.500	828400	6779717.285
1988	9157489.893	66.3	6071415.799	843900	6746316.320
1989	8932817.008	71.3	6369098.527	782000	6605540.220
1990	9475800.000	66.2	6272979.600	743900	6702937.000
1991	10599400.000	70.62	7485296.280	714300	6638263.280
1992	12778900.000	70.045	8950980.505	709500	6687044.483
1993	14642700.000	69.47	10172283.690	703000	6944398.614
1994	16796700.000	65.575	11014436.025	727000	8275355.497
1995	19081600.000	61.68	11769530.880	754000	9705561.556
1996	21347974.919	62.2	13278440.400	787000	10859580.235
1997	23663241.370	60.86	14401448.698	807000	11350038.750
1998	25540367.587	62.26	15901432.859	833000	11986207.453

Sources: GSO (various years), CIEM and MOF surveys and author's calculation.

Appendix 2: Year to year TFP growth of industrial SOEs for the 1976-1998 period

Year	Growth rate of output	Growth rate of inputs	Growth rate of workers	Growth rate of capital	TFP growth rate
1976	0.0000	0.0000	0.0000	0.0000	0.0000
1977	0.1178	0.1143	0.0651	-0.0189	0.0500
1978	0.0583	0.0759	0.1118	-0.0151	-0.0016
1979	-0.1036	-0.1283	0.0612	-0.0196	-0.0492
1980	-0.1520	-0.2487	-0.0103	-0.0145	-0.0225
1981	-0.0101	0.1760	-0.0232	0.0108	-0.0950
1982	0.0395	0.0421	0.0165	0.0161	0.0114
1983	0.1155	0.1253	0.0644	-0.0099	0.0405
1984	0.1426	0.0973	0.0632	0.0529	0.0687
1985	0.1003	0.0662	0.0172	-0.0109	0.0656
1986	0.0617	-0.1348	0.0522	-0.0025	0.1178
1987	0.0926	0.0729	0.0668	-0.0262	0.0466
1988	0.1546	0.2737	0.0187	-0.0049	0.0148
1989	-0.0245	0.0490	-0.0733	-0.0209	-0.0281
1990	0.0608	-0.0151	-0.0487	0.0147	0.0762
1991	0.1186	0.1933	-0.0398	-0.0096	0.0331
1992	0.2056	0.1958	-0.0067	0.0073	0.1078
1993	0.1458	0.1364	-0.0092	0.0385	0.0717
1994	0.1471	0.0828	0.0341	0.1917	0.0579
1995	0.1360	0.0686	0.0371	0.1728	0.0572
1996	0.1188	0.1282	0.0438	0.1189	0.0200
1997	0.1085	0.0846	0.0254	0.0452	0.0510
1998	0.0793	0.1042	0.0322	0.0560	0.0083
Average	0.0745	0.0678	0.0217	0.0249	0.0305

Appendix 3: Year-to-year growth rate of industrial SOE output



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