



## An assessment of state-owned enterprises' performance in Vietnam: the total factor productivity analysis

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### Abstract

*The article uses data from the enterprise census for the period 2011-2021 to estimate and evaluate total factor productivity (TFP) of state-owned enterprises (SOEs) in Vietnam. Although assessment of SOEs requires a separate criteria system, the assessment of SOEs based on financial performance results still has many theoretical and practical meanings. The results show that, if using labor productivity, SOEs have outstanding results. Small and medium-sized SOEs still have relatively good results in terms of TFP contribution to added value. However, the results of large-scale SOEs are lower than those of private enterprises of corresponding size. This could be due to a number of reasons and should be open to evaluation.*

**Keywords:** state-owned enterprises, performance, total factor productivity, Vietnam.

**JEL classification:** E01, E02, E17.

## 1. Introduction

Efficiency assessment of enterprises is a widely studied topic in the literature. For non-state enterprises, scholars often employ profit, productivity or market shares as criteria for performance evaluation. These indicators directly reflect the objectives of non-state enterprises, including maximizing owners' value (via profit) or enhancing competitiveness (via productivity or market shares). In addition, other potential indicators, such as social responsibility or innovation, may also be considered. However, the assessment of state-owned enterprises (SOEs) is more complicated. SOEs may pursue different objectives, such as market stabilization. As a result, their assessment cannot only be based on economic indicators. In principle, the evaluation of various types of enterprises should align with their respective objectives. However, the existence and operation of SOEs involve multiple dimensions. In other words, each SOE may pursue various goals, which are not necessarily uniform across enterprises. Consequently, establishing a standardized analytical framework or a universal set of criteria for evaluating SOEs remains challenging.

Although the number of SOEs and their scope of operations have been reduced, they still account for 25.78 percent of the total production capital in Vietnam. SOEs hold dominant shares in some industries, such as energy, telecommunication, and banking. Vietnam Electricity (EVN), Vietnam Oil and Gas Group (PetroVietnam), and Vietnam National Coal and Mineral Industries Holding Corporation (Vinacomin) collectively account for 87 percent of the total installment capacity of electricity generation in Vietnam. Similarly, Viettel, VNPT, and Mobiphone control 90 percent of the telecommunication market (Le and Pham, 2023). Therefore, state-owned enterprises (SOEs) have played a "leading, dominating, and pivotal role in important and essential industries and sectors of the economy" (Minh Anh, 2024). However, several studies imply that the performance of SOEs falls below their potential (Tran and Nguyen, 2021; Le and Pham, 2023). These studies employed economic indicators and tended to analyze SOEs as a single entity rather than categorizing them based on size.

From an international perspective, Peng et al. (2016) discussed different theories of the (state-owned) firm and their corresponding objectives. The theories imply that evaluation criteria should be based on their views on state-owned enterprises. Sorrentino (2020) further supports the argument of the multi-objectives and corresponding evaluation indicators for SOEs. However, both studies acknowledge that while maximizing profit is an important criterion, it is not the only determinant of SOEs' performance.

Regarding SOEs in Vietnam, some studies focus on the allocative efficiency of resources within different types of enterprises. The studies consistently identified inefficient allocation, or "distortion" in resource allocation within SOEs. However, Zhou and

Oostendorp (2024) pointed out that the “distortion” in resource allocation is caused by the relatively large scale of SOEs compared to private enterprises. This “distortion” has minimal overall impacts on efficiency. Similarly, Bach (2019) also found that while inefficient resource allocation exists across different types of enterprises, SOEs and foreign direct investment (FDI) enterprises exhibit lower “distortion” in capital use than private enterprises. This character leads to mechanisms that cancel out each other regarding the impact of inefficient capital allocation for SOEs and FDI enterprises. This finding suggests a diminishing effect of capital allocation “distortion”, supporting the efficiency of SOEs and means that the SOEs are not unequivocally classified as inefficient. At the same time, the “distortion” of resource allocation among SOEs is relatively small concerning their sizes, which is an important consideration for future research on SOEs’ efficiency in Vietnam.

As a result, assessing efficiency based on monetary performance remains an important approach for evaluating SOEs, supported in the literature (Peng et al., 2016; Sorrentino, 2020), and aligns with Vietnam’s regulatory framework for supervising SOEs. While a comprehensive evaluation of SOEs should consider contextual factors, an indicator-based economic assessment continues to play a vital role in assessing the performance of SOEs. Therefore, this article will evaluate the efficiency of SOEs compared to other types of enterprises in Vietnam during 2010-2020, employing total factor productivity (TFP) as the primary metric. TFP offers advantages over other economic indicators, such as profit or labor productivity, because it can reflect financial results (output value) and differences in capital equipment or between industries. Additionally, this analysis incorporates firm sizes to provide a more nuanced assessment. By comparing and evaluating SOEs based on size and TFP, this study aims to present a more comprehensive and realistic picture of SOEs’ performance relative to other types of enterprises.

## **2. Total factor productivity estimation and data**

### ***2.1. Total factor productivity***

TFP is understood as the remainder of output after subtracting the contributions of input factors. For revenue as an output, we subtract the contributions of capital, labor, and intermediate inputs. Similarly, for value-added output, we subtract the contributions of capital and labor. TFP estimation can be done at different levels, ranging from the entire economy to specific industries or individual enterprises. This section outlines the methodology used to estimate TFP at the enterprise level.

In general, TFP can be estimated by either parametric or non-parametric approaches. The parametric approach involves establishing a functional relationship between outputs and intermediate inputs through econometric modeling or computational methods, followed by calculating TFP. Meanwhile, the non-parametric approach, such as Data Envelopment

Analysis, estimates TFP directly by calculating different components under its specification of TFP. In this study, we employ the parametric approach by estimating the production function and then calculating TFP and other indicators.

Assuming that enterprise  $i$ , has the Cobb-Douglas production function:

$$VA_{it} = A_{it}K_{it}^{\alpha}L_{it}^{\beta}e^{\varepsilon_{it}} \quad (1)$$

where  $VA_{it}$ ,  $L_{it}$ , and  $K_{it}$  are the value added, labor and capital of enterprise  $i$  in year  $t$  respectively.

Taking logarithm form of both sides of (1), we have:

$$\ln(VA_{it}) = \ln(A_{it}) + \alpha \ln(K_{it}) + \beta \ln(L_{it}) + \varepsilon_{it} \quad (2)$$

$A_{it}$  denote the production efficiency of enterprise  $i$ , or total factor productivity. It can be estimated as:

$$\ln(A_{it}) = \ln(VA_{it}) - \hat{\alpha}\ln(K_{it}) - \hat{\beta}\ln(L_{it}) \quad (3)$$

where  $\hat{\alpha}$  and  $\hat{\beta}$  are estimations of  $\alpha$  and  $\beta$  in (1).

The key issue of (3) lies in the estimations of  $\alpha$  and  $\beta$ . (2) is a linear function and can be estimated with OLS algorithm.

However, (2) often suffers from endogeneity problems. A common argument for the endogeneity of (2) is the simultaneity problem. Investment and output may be determined simultaneously in the presence of shocks in enterprises, leading to endogeneity problems. Therefore,  $\hat{\alpha}$  and  $\hat{\beta}$  may be biased if estimated by the conventional OLS algorithm.

To address this problem, we use the semi-parametric method of Olley and Pakes (1996), modified by Levinsohn and Petrin (2003). Accordingly, the error component  $\varepsilon_{it}$  is decomposed into two parts,  $\omega_{it} + \mu_{it}$ , where  $\omega_{it}$  is the production function component of each firm and  $\mu_{it}$  is white noise.

Levinsohn and Petrin (2003) proposed and demonstrated that  $\omega_{it}$  can be estimated semi-parametrically from the capital and intermediate inputs of the firm. Enterprises may take longer to change their capitals with unobserved (for outsiders) shocks. However, the intermediate inputs can be changed quickly. Therefore, the effects of shocks reflect in a change in intermediate inputs. Consequently, intermediate input changes can be used as a proxy for capital changes. With this estimation, the coefficients,  $\hat{\alpha}$  and  $\hat{\beta}$ , are unbiased.

Exponentiation (3) gives us the absolute value of TFP,  $A_{it}$ . Comparing  $A_{it}$  across firms is not particularly meaningful as firms differ in size. Therefore, to compare efficiency across firms, we calculate the ratio or contribution of TFP to the total value added.

$$TFPRatio_{it} = 100 * \frac{A_{it}}{Y_{it}} \quad (4)$$

This ratio indicates the percentage of the value added of firm  $i$  that is attributed to TFP in year  $t$ .

An important step in estimating TFP is the estimation of the production function. A fundamental assumption in this estimation is that the production function is homogeneous across firms or all firms under estimation share the same production function. This assumption is relatively strong if the sample includes all industries. Therefore, firms are typically grouped based on their production function to improve estimation accuracy. A common approach is to estimate production function for firms within the same two-digit industries as firms in the same two-digit industries are assumed to have the same production function. However, firm size is critical in technological differences, even within the same two-digit industries. As a result, control for firm sizes in production function estimation is needed. The control for size is more important in the context of differences in sizes between SOEs and private enterprises, as well as the influence of the size in adjusting the “distortions,” as discussed by Zhou and Oostendorp (2024).

However, if the grouping in terms of size is too detailed, some sub-groups do not have enough observations to estimate. To balance between homogeneity assumption in terms of size and industry and number of observations, we group the two-digit industries into 14 industry-groups according to the European Statistical Agency’s classification, which considers the characteristics and technology level of two-digit industries. These 14 industry groups are further divided by size, following Vietnam Government’s Decree No. 80/2021/ND-CP on enterprise sizes in Vietnam. Accordingly, enterprises are divided into four groups: micro, small, medium, and large. This classification results in 56 industry-size sub-groups, each estimated separately.

Another problem is that technology may also change if the estimation period is too long, such as ten years. Consequently, we need to control for time spans as well. We divide the study period into 2010 - 2015 and 2016 - 2020. A period of five years is a reasonable assumption for technological stability.

Conclusively, we will have 112 industry-size-time sub-groups for separate estimation. This is a reasonable number to estimate enterprises' TFP. This number of groups balances the accuracy of the estimate and the number of observations within sub-groups in the sample.

## **2.2. Data and data preparation**

The data used in this study are derived from the Annual Enterprise Surveys conducted by Vietnam’s General Statistics Office. By combining the survey data with inference methods, the dataset provides comprehensive coverage of all enterprises operating in Vietnam since 2000. This extensive and relatively complete database allows for a thorough analysis of the development and characteristics of this vital sector of the economy.

The survey collects basic business information, such as industry classification, ownership structure, revenue, number of employees, etc. The available information allows us to calculate the value added, capital, and labor of enterprises to estimate TFP. However, the lack of information on intermediate input is a major disadvantage of the data. As a result, value-added must be computed using the cumulative method, which limits the ability to compare different calculation methods.

Consequently, the value added to an enterprise is only calculated using the cumulative method. Under the cumulative method, the enterprise's value added equals the sum of pre-tax profits, depreciation, laborers' income, interest expenses, value-added tax, and other state budget contributions, excluding corporate income tax. All of these indicators are available in all years of the study period. This method is based on the approach that the value added is the income of the production factors.

Similarly, fixed capital is calculated by deducting depreciation from the initial book value. Meanwhile, labor is calculated by averaging the number of employees at the beginning and end of the year. In addition, intermediate inputs are calculated by subtracting the value added from net revenue, an indirect method for calculating this indicator. Intermediate inputs are used as a proxy in estimating the production function (2) with the semi-parametric method of Olley and Pakes (1996), modified by Levinsohn and Petrin (2003).

The identification indicators in the survey allow us to construct panel data sets of enterprises over the years. Although there is a duplication in identifying enterprises with the information, the rate is less than 1 percent, implying the reliability of the identifiers. The panel data can be constructed for 2010-2020 and balanced or unbalanced. Theoretically, the balanced panel covers all enterprises in the study period. Meanwhile, the unbalanced panel covers all possible enterprises existing for more than one year from 2010 through 2020. Given the high dynamism of Vietnam's enterprise sector, especially the private domestic enterprises, the unbalanced panel data provides a more comprehensive representation of the sector over time. As a result, the unbalanced panel data is used for estimation.

With the panel data and information on value added, capital, and labor presented above, we can estimate (2) using the semi-parametric model of Olley and Pakes (1996), modified by Levinsohn and Petrin (2003). From the production function estimation results, we can calculate (3) and (4). The result of the TFP contribution to the value-added, according to formula (4), is used to evaluate the efficiency of enterprises.

Outliers in enterprise survey data are inevitable. These outliers stem from the large scale of data collection and the use of inference methods to assign data to enterprises that have not been fully surveyed. In addition, small enterprises' financial statements have not been audited and might have illogical data in the accounting system. Therefore, we need to identify and exclude outliers in the data.

To exclude outliers, we conduct the following steps: (1) removing observations with abnormal values of capital and revenue, observations with capital or revenue less than 0 or missing data will be removed; (2) removing observations of the 1 percent highest and 1 percent lowest values of labor productivity within each year of the two-digit industries. At the same time, observations with labor productivity exceeding 20,000 million VND per year are also excluded. We use labor productivity as a criterion for determining outliers because it is a synthetic indicator reflecting the performance of enterprises. In addition, the calculation is purely statistical, meaning it is not affected by estimation methods such as TFP.

The 2019 dataset exhibits anomalies in labor income, particularly among small enterprises, due to potential issues in the inference process. Therefore, we additionally exclude enterprises that meet the following criteria: (i) inferred data is used for the enterprise, (ii) the enterprise has an average workforce of fewer than ten employees, and (iii) the reported average labor income exceeds 1,200 million VND per year. The exclusion criteria here are reasonable, as inferred data is based on the averages, making labor incomes above the threshold of over 1,200 million VND a year highly abnormal.

### **3. Shares of state-owned enterprises**

#### **3.1. Labor share**

An analysis of the SOEs in the total number of enterprises in Vietnam reveals the following features. The number of SOEs has continuously decreased from 2010 to 2020 (Table 1). Compared to 2010, the number of state-owned enterprises has reduced by about one-third. It is worth noting that this trend persisted through 2020, with a further reduction of 152 enterprises compared to 2019. Meanwhile, the number of enterprises has continued to increase, resulting in a diminishing share of SOEs in the total enterprise structure.

However, the labor share exhibited a different trend (Table 1). In 2020, there was an increase in the labor share of SOEs. A decrease in private enterprises caused the increase in the labor share of state-owned enterprises, while the share of FDI enterprises remained relatively stable. This shift could be attributed to the impact of the COVID-19 pandemic. SOEs tend to offer greater labor stability, allowing them to maintain employment levels. Meanwhile, domestic private enterprises were more severely affected, resulting in significant job losses.

TABLE 1: Number of enterprises and labor shares across types of ownership

Year	Number of enterprises			Labor share (percent)		
	State-owned enterprises	Domestic private enterprises	FDI enterprises	State-owned enterprises	Domestic private enterprises	FDI enterprises
2010	3,133	269,355	6,980	16.18	62.31	21.52
2011	3,276	319,893	9,923	14.52	62.76	22.72
2012	3,137	335,536	8,511	14.76	61.62	23.62
2013	3,065	365,853	9,962	12.44	61.74	25.82
2014	2,931	400,982	11,163	10.85	61.6	27.55
2015	2,755	440,072	11,912	9.57	61.31	29.11
2016	2,568	496,007	13,861	9.13	61.2	29.67
2017	2,399	554,350	16,155	7.76	61.58	30.66
2018	2,112	602,584	16,092	5.07	62.2	32.73
2019	2,071	668,108	18,383	5.13	61.3	33.57
2020	1,919	675,010	22,230	6.43	58.86	34.71

Source: Authors' calculation with data from enterprise censuses 2011-2021.

### 3.2. Shares of revenue and the value added

To analyze SOEs' contribution to the enterprise sector's total output, we analyze their shares of total revenue and total value added (Table 2).

TABLE 2: Shares of enterprise by ownership types in terms of revenue and the value added (percent)

Year	Revenue			Value added		
	State-owned enterprises	Domestic private enterprises	FDI enterprises	State-owned enterprises	Domestic private enterprises	FDI enterprises
2010	21.63	59.67	18.70	27.95	50.17	21.87
2011	24.70	58.17	17.13	32.39	44.49	23.12
2012	20.78	57.55	21.67	28.63	45.04	26.33
2013	20.46	60.46	19.08	27.08	45.81	27.11
2014	17.56	61.30	21.14	25.17	44.76	30.07
2015	14.25	57.52	28.23	23.15	42.13	34.71
2016	12.93	59.68	27.39	20.68	44.86	34.46
2017	13.12	57.82	29.05	17.91	46.79	35.31
2018	7.08	60.48	32.44	13.12	48.64	38.24
2019	9.13	59.38	31.49	8.22	60.75	31.03
2020	12.72	55.79	31.49	15.40	43.22	41.39

Source: Authors' calculation with data from enterprise censuses 2011-2021.

The fact that SOEs' revenue share exceeds their labor share implies that their labor productivity (calculated by revenue per worker) is higher than the average. Furthermore, the revenue share of FDI enterprises is lower than their labor share, indicating that the labor productivity of SOEs is even higher than that of FDI enterprises because SOEs disproportionately operate in capital-intensive industries such as infrastructure, chemicals, banking, etc. In comparison, FDI enterprises have a higher share in labor-intensive industries. As a result, the higher labor productivity of SOEs is partially caused by the industry premiums in labor productivity.

A less favorable point is that the value added to the revenue ratio of SOEs compared to that of FDI enterprises tends to decrease in 2019 - 2020. This ratio is an indicator reflecting the position of an enterprise in the value chain, the higher this ratio reflects the higher position of the enterprise in the value chain in the industry (Burger et al., 2018). We need to compare this ratio of two types of enterprises in the same industry to compare accurately at a point in time, and the overall comparison over time will reflect the trend. This ratio of SOEs was higher than that of FDI enterprises, but this ratio fell below that of FDI enterprises in 2019 and 2020, which requires further analysis.

#### 4. TFP of state-owned enterprises

With the cleaned data, we estimate (2) using the semi-parametric method of Olley and Pakes (1996), modified by Levinsohn and Petrin (2003). After obtaining the TFP of enterprises, we calculate (4); the results are presented in Tables 3 and 4. To maintain conciseness, we do not present the results of estimating (2) and calculating (3) because our primary focus is to assess the contribution of TFP to the value-added of enterprises.

**TABLE 3: Contribution of TFP to the value added, all and small enterprises (percent)**

Year	All enterprises				Small enterprises			
	State-owned enterprises	Domestic private enterprises	FDI enterprises	Average	State-owned enterprises	Domestic private enterprises	FDI enterprises	Average
2010	17.89	27.06	13.97	24.08	51.27	39.38	30.21	39.16
2011	17.55	39.28	16.52	32.31	58.44	55.62	29.01	54.34
2012	17.07	32.35	14.33	27.94	56.76	53.10	26.04	51.94
2013	19.18	37.89	15.03	31.98	44.68	57.49	31.82	56.22
2014	23.32	43.89	15.96	36.64	44.65	68.97	30.95	66.85
2015	21.15	33.68	12.85	26.41	34.80	44.69	26.55	42.76
2016	38.18	29.58	14.49	26.56	29.34	20.44	15.25	20.12
2017	21.80	27.91	15.23	24.00	42.53	18.09	14.11	17.95
2018	22.25	25.17	17.45	22.65	32.68	18.84	13.80	18.44
2019	27.18	30.44	17.57	25.78	26.36	25.53	14.24	24.27
2020	16.42	26.08	16.30	21.93	37.04	22.44	13.07	21.39

*Source:* Authors' estimation with data from enterprise censuses 2011-2021.

As shown in Table 3, the contribution of TFP to the value added of SOEs is lower than that of domestic private enterprises but higher than that of FDI enterprises. The superiority of domestic private enterprises is stable over time. This small contribution shows a particular inefficiency of state-owned enterprises compared to domestic private enterprises. However, the results also show that the difference in TFP contribution to the value added between the two types of enterprises has narrowed since 2016.

SOEs exhibit a higher ratio of TFP to value-added than FDI enterprises, which can be considered a positive result. However, the fluctuation in this ratio among SOEs is a disadvantage. In other words, FDI enterprises maintain a more stable ratio of TFP to value-added than SOEs, implying a more stable performance of FDI enterprises.

**TABLE 4: Contribution of TFP to the value added, medium and large enterprises (percent)**

Year	Medium enterprises				Large enterprises			
	State-owned enterprises	Domestic private enterprises	FDI enterprises	Average	State-owned enterprises	Domestic private enterprises	FDI enterprises	Average
2010	21.39	12.46	20.40	13.99	17.11	33.14	11.08	23.37
2011	15.08	16.16	24.95	17.10	16.80	36.82	13.63	25.07
2012	19.38	14.53	21.19	15.65	15.96	29.52	12.43	21.43
2013	17.66	16.50	22.32	17.30	18.73	35.19	12.55	23.89
2014	13.74	19.05	23.03	19.32	23.26	33.13	13.98	24.49
2015	32.34	16.76	21.77	18.35	20.17	34.31	10.85	22.61
2016	19.06	8.66	10.53	9.36	39.08	42.90	14.74	31.05
2017	19.40	8.38	12.98	9.64	21.46	40.98	15.31	27.27
2018	10.63	11.33	14.47	12.01	22.81	33.20	17.98	24.87
2019	9.51	12.62	14.65	13.05	28.29	33.07	18.04	24.91
2020	20.13	9.94	16.22	11.85	15.99	27.13	16.56	20.79

*Source:* Authors' estimation with data from enterprise censuses 2011-2021.

However, the analysis presents a remarkably different picture when considering size subgroups. Small and medium SOEs exhibit a higher TFP contribution to the value-added than private enterprises of the same size. This may be attributed to the relative inefficiency of small and medium private enterprises while also indicating that small and medium SOEs operate more efficiently than their larger counterparts. This finding contradicts the argument that the government has primarily equitized profitable SOEs (OECD, 2021).

Large-scale SOEs demonstrate a lower TFP contribution to the value added than private enterprises of the same size. This disparity may stem from mechanisms through which these enterprises achieve large-scale expansion. SOE growth is often driven by mergers and restructuring, which may affect the enterprises' post-restructuring performance. Meanwhile, the development of private enterprises is a selective process, whereby only the most efficient enterprises tend to develop on a larger scale.

In addition, the difference in TFP contribution to the value added among groups of sizes varies across ownership types. The contribution of TFP to the value added is lower in large SOEs or FDI enterprises than in small enterprises of both types. However, the opposite pattern is observed in private enterprises, where larger firms exhibit significantly higher TFP contribution than small ones. This pattern reflects the natural development of private enterprises, where those with superior performance expand over time while small private enterprises, including newly established ones, tend to have lower productivity.

Therefore, it can be seen that the TFP contribution to the value added of SOEs is lower than that of private enterprises but higher than that of FDI enterprises. However, the TFP contribution to the value added concerning sizes differs across ownership types. Small and medium SOEs exhibit a higher ratio of TFP to value added than private enterprises. Meanwhile, this ratio is relatively lower in large SOEs compared to corresponding private ones. The lower rate in large SOEs and the high proportion of this group are why the ratio of TFP to the value added in SOEs is below that of private enterprises on average.

## **5. Conclusion**

Evaluating the performance of SOEs based on monetary criteria is a meaningful approach, supported by the literature and Vietnam's regulatory framework. In the literature, studies acknowledge the multi-objective nature of SOEs but still consider financial results an important indicator of performance. In regulatory terms, financial indicators constitute three out of five criteria used to assess SOEs' performance according to Decree No. 87/2015/ND-CP.

This study estimates the contribution of TFP to enterprises' value-added. This ratio not only indirectly reflects enterprises' financial results but also partly controls differences in the industry composition of various enterprises, making it a reasonable criterion for evaluating SOEs' performance.

An analysis of SOEs' shares across different criteria reveals that SOEs exhibit higher labor productivity and value-added-to-revenue ratios than domestic private enterprises. The higher labor productivity of SOEs may primarily result from capital intensity and operating industries. Therefore, it may not reflect the performance of SOEs. Meanwhile, the high value-added-to-revenue ratio reflects that SOEs occupy a better position than private and FDI enterprises in the value chain in each industry; this is a positive point for state-owned enterprises. However, this ratio was lower in SOEs than in FDI enterprises in 2019 and 2020. Although this may be a short-term trend, it is an issue that needs further attention and analysis.

SOEs exhibit a lower TFP contribution to the value-added than private enterprises on average; however, this gap has narrowed over time. However, SOEs outperformed FDI enterprises in this metric, suggesting that SOEs' overall efficiency is moderate when assessed by TFP contribution to the value added.

Regarding the sub-groups of enterprises by size, TFP contribution to the value added is lower in SOEs than in private enterprises due to [the inefficiency of] large SOEs. Small and medium SOEs demonstrate a higher TFP contribution to the value added than private firms. However, large SOEs, representing a large proportion, exhibit a lower TFP contribution than corresponding-size private ones, pulling down the average TFP contribution to value added in SOEs.

Therefore, it is evident that SOEs are not universally inefficient. A certain group of SOEs have outperformed those of both private and FDI enterprises. Meanwhile, the underperformance of large SOEs may be attributed not only to competitiveness but also to structural factors, including the impact of past restructuring processes. Intensive research is necessary to identify the underlying causes of inefficiency.

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