

The Role of Chinese State-owned Enterprises in Implementing Five-Year Plans *

Vera Z. Eichenauer[†]

Nathan Vieira[‡]

Feicheng Wang[§]

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Abstract

State-owned enterprises in China are far more numerous and larger (in absolute and relative terms) than in other countries. One explanation for the number and size of Chinese SOEs is that they are used by the Chinese government to manage the Chinese economy. In this paper, we use Chinese firm-level data in a difference-in-difference framework to examine how China implements its industrial policy, focusing on the role of SOEs in the 10th Five Year Plan. We find that China relied on state-owned enterprises to achieve higher average productivity in the sectors supported by the plan. To understand the source of this productivity increase, we examine different forms of government support (subsidies, tax credits) received by different types of firms.

JEL Code: D24; L52; P31

Keywords: China, Industrial Policy, State-Owned Enterprises, Five-Year Plan

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[†]ETHZ. Contact: eichenauer@kof.ethz.ch.

[‡]University of Aix-Marseille. Contact: nathan.vieira@univ-amu.fr

[§]University of Groningen. Contact: f.wang@rug.nl

1 Introduction

In the 2022 Global 500, an annual ranking of the world's 500 largest companies by revenue, China ranked at the top in terms of number of companies. State-owned enterprises (SOEs) accounted for more than half of the Chinese companies on the list (82 over 130). The number of Chinese companies and Chinese SOEs in the Global 500 has risen remarkably over the past decade (see Figure 1). In 2014, Chinese SOEs that were part of the Fortune Global 500 generated a revenue that was five times higher than that of the other Asian SOEs on the list. By 2022, more than half of SOEs in the Global 500 are from China (82 over 151). At the same time, the business press and literature have often described SOEs as a brake on China's development¹, and recommendations have been made to reduce their size and number.² In this paper, we aim to understand why China still has so many large SOEs by examining the role of SOEs in the Chinese economy.

We specifically examine the role of SOEs in achieving China's economic goals in the context of the Five-Year Plans (FYP). FYP is an important series of economic policies that guide the Chinese economy and that are updated every five years. We hypothesise that SOEs are used by the Chinese government to implement the priorities set out in the FYPs. SOEs are a legacy of the Soviet-style planned economy and are closely linked to the Chinese government. As such, they are often an instrument to facilitate the implementation of government policies. In contrast, private firms are informed of the government's priorities through the FYP and are incentivized to implement these priorities. Thus, private firms may be more free in the implementation of the government's industrial priorities. In this paper, we focus on the 10th FYP. This is because we have firm-level data that cover the period both before and after the implementation of the FYP. This allows us to implement a difference-in-differences (DiD) empirical approach to explore the causal effects of the 10th FYP. More importantly, the 10th FYP covers a highly dynamic period in the Chinese economy during which China reformed and liberalized its domestic economy significantly, leading to unprecedented economic growth thereafter. Understanding how China implemented economic policies and the role that SOEs played in this process is crucial for comprehending China's

¹See e.g. [Has china given state-owned enterprise reform; Why China Grows So Fast; China State Enterprises Advance, Private Sector Retreats](#)

²See e.g. [Zhu \(2012\); of the State Council and Bank \(2013\); Lardy \(2014\); China \(2017\)](#).

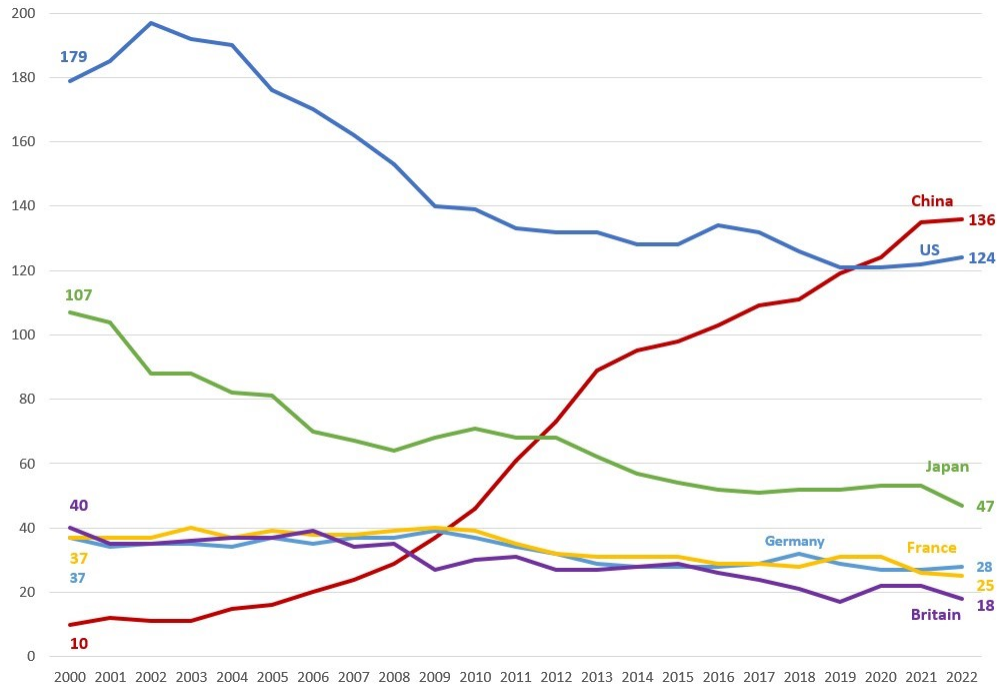


Figure 1: Number of firms in Fortune Global 500 by country

Source: Fortune Global 500. Computations: Center for Strategic and International Studies (CSIS).

economic growth.

Using firm-level data from the Annual Survey of Industrial Production and information on manufacturing priorities in the 10th FYP, we empirically test this hypothesis. In the 10th FYP, the Chinese government listed certain industries to be developed in order to “optimise and upgrade the industrial structure”³ of China. We re-use the classification of Chen et al. (2022) to group firms into those that belong to the industries targeted by the FYP and those that do not, based on the Chinese industry classification codes at the four-digit level. We first identify the treatment effect of the FYP using a difference-in-difference (DiD) approach. With this approach, we compare the difference in average productivity of the targeted industries before and after the 10th FYP with that of the non-targeted industries. We then delve into heterogeneity analysis to understand the mechanisms, especially the role of the SOEs in driving the results.

We find that the Chinese government has relied heavily on SOEs to achieve the goals of the 10th FYP. Overall, the 10th FYP has been a source of productivity growth for the supported

³source: Outline of the 10 FYP

industries. This is evident from the higher productivity growth for state-owned enterprises (SOEs) in the supported industries than for privately owned enterprises (POEs) in the same industries. We also find that SOEs belonging to the targeted industries received more financial support from the Chinese government. These results thus provide evidence on the role of SOEs in the implementation of Chinese industrial policy.

Our paper contributes to the literature on the role of SOEs in the Chinese economy and provides a reason for the paradox of the weight of SOEs in the Chinese and global economies. The weight of SOEs in the Chinese economy has often been criticised in the literature. Research shows that SOEs are less productive (Borensztein and Ostry, 1996; Lin et al., 1998; Yu, 2014), less innovative (Fang et al., 2017), heavily indebted (Molnar and Lu, 2019), with agency problems (Milhaupt, 2020). SOEs also prevent the expansion of the private sector (Du et al., 2014), which was at the root of China's spectacular growth from the 1980s to the first decade of the 21st century (Zhu, 2012). Yet, SOEs are protected from market competition and receive favourable treatment from the state (Li et al., 2009; Chen et al., 2017; García-Herrero and Ng, 2021). In addition to ownership, SOEs are closely linked to the Chinese government, and SOE leaders with patronage ties to elites responsible for their evaluation are more likely to remain in office (Leutert and Vortherms, 2021). The literature provides descriptive evidence of strong managerial links between SOEs and the Chinese government (Brødsgaard and Li, 2013; Blanchette, 2020). As such, the Chinese government can influence SOE behaviour even without direct control. Previous works have shown that SOE CEOs' career concerns influence their decisions (Leung, 2002; Xie, 2015). In this paper, we show that there is a political role for SOEs which may explain their unconventional size. As documented by Liu et al. (2015) we find that SOEs receive more support from the Chinese government. Even though we observe that the Chinese government have increased the share of private capital in the industries to develop (Branstetter et al., 2023), we still find that SOEs are the main target of the industrial policy, regardless of the variation in their degree of state ownership.

The paper proceeds as follows. In section 2, we introduce the key notions on the 10th FYP and the role of SOEs in the Chinese economy. In section 3, we present our dataset and the empirical methodology that we use to understand the heterogeneous effects of the 10th FYP. Section 4

presents our main results and robustness checks. In section 5, we document the mechanism behind the heterogeneous effects of the 10th FYP on productivity. Finally, section 6 concludes.

2 Background

In this paper, we estimate the impact of the 10th Five-Year Plan on the average productivity of industries by distinguishing between State-owned enterprises and other firms. In this section, we first introduce the background information for the Five-Year Plans in China and then explain the role of SOEs in implementing the FYPs.

2.1 The 10th Five-Year Plan

Five-Year Plans in China are economic and social development blueprints that outline the country's goals, targets, and strategies over a five-year period. These plans are initiated and implemented by the Chinese government to guide the allocation of resources, promote economic growth, and address key social challenges. They focus on achieving specific targets and priorities set by the government, which may include economic growth targets, poverty alleviation goals, urbanization plans, and advancements in key industries.

The 10th FYP in China covered the period from 2001 to 2005. It aimed to promote economic growth and social development and address various challenges faced by the country during that time. One of the main goals was to upgrade and modernize China's industrial and infrastructure sectors. The 10th FYP targeted strategic industries to develop in order to reshape its industrial structure. The plan recognized the importance of technology and innovation in driving economic growth and competitiveness. To achieve this, measures were implemented to promote research and development, encourage technology transfers, and enhance the productivity and efficiency of industries. By focusing on raising productivity in targeted industries, China aimed to accelerate economic growth, improve the quality of products and services, and enhance its global competitiveness.

The 10th FYP measures were part of the broader strategy to transform China's economy into

a more innovation-driven and technologically advanced powerhouse. The 10th FYP is part of the 15-year outline "2010 long-term outline: upgrade and improve competitiveness" and most industries targeted were part of the Strategic Emerging Industries (SEIs, figure 2) afterward. The 10th FYP also reaffirmed the "grasping the large and letting the small go" reform adopted in September 1997. The "grasping the large" component indicated that policymakers should focus on maintaining state control over the largest state-owned enterprises (which tended to be controlled by the central government). "Letting the small go" meant that the central government should relinquish control over smaller state-owned enterprises. Relinquishing control over these enterprises took a variety of forms: giving local governments the authority to restructure the firms, privatizing them, or shutting them down. Following this policy, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) was created in 2003 to manage the remaining SOEs.

2.2 The Role of State-Owned Enterprises

In the context of China, state-owned enterprises refer to companies that are fully or partially owned by the Chinese government or its agencies. These enterprises play a significant role in the Chinese economy and cover various sectors, including energy, telecommunications, finance, transportation, and manufacturing. The Chinese government exercises significant control and influence over state-owned enterprises through mechanisms such as appointing top management, setting strategic priorities, and regulating their operations. These enterprises often receive financial support, preferential policies, and access to resources from the government.

The place taken by SOEs in the Chinese economy is frequently criticized. Even the Chinese government, since the end of the 20th century, has frequently expressed its desire to reform the economic system and establish a socialist market economy (sometimes called "state capitalism") where the State keeps the ownership but reduces its influence on SOEs' management decision. The "grasping the large and letting the small go" policy was the most visible political act but it was followed by others in the 10th or 11th FYP with the aim of reducing the number of SOEs

and making them more market-oriented⁴. However, after 2008 the number of SOEs started to increase again (table 3). Indeed, even during the “grasping the large and letting the small go” the sum of value-added produced by SOEs has increased continuously. Finally, the literature does not observe a change in SOEs management. Recently, [Leutert and Eaton \(2021\)](#) note that the Chinese government has intervened more directly and forcefully in corporate decision-making in recent years.

We hypothesise that the Chinese government relies on the SOEs for its implementation of the FYPs and hence economic growth for two reasons. First, because of their ownership, SOEs are under the direct control of the central government. Compared to the POEs, it may be easier and more straightforward for the government to shape and sometimes even directly control the performances of the SOEs. Second, SOEs were originally a “tool” in the hand of the “Chinese people” (as advocated by Mao).⁵ We expect to find path dependency and remnants of the planning era. Although the Chinese government’s attitude towards SOEs has changed over the years, some public statements from the Chinese government have been along these lines. [Brødsgaard and Li \(2013\)](#) note from the speech of President Xi Jinping in 2009 when he was the Vice President at the Conference on Party Building Works of SOEs, that one function of SOEs is to be an executor of the Chinese government’s industrialisation strategy. Finally, since the line between the Chinese Communist Party and the board of directors of SOEs is porous, we believe that career concerns may lead SOE CEOs to make management decisions more in line with the current objectives of the Chinese government.

⁴For instance, in the 11th FYP outline, the Chinese government emphasized that SOEs must “adhere to the separation of governmental functions from enterprises, release access, introduce competition, supervise and control by law and push the reform of monopoly industry management system and property right system

⁵During Mao’s time, under central planning, SOEs were actually affiliated organisations of the government, playing the role of workshops of the great national “factory” as well as working units providing social welfare to Chinese workers.

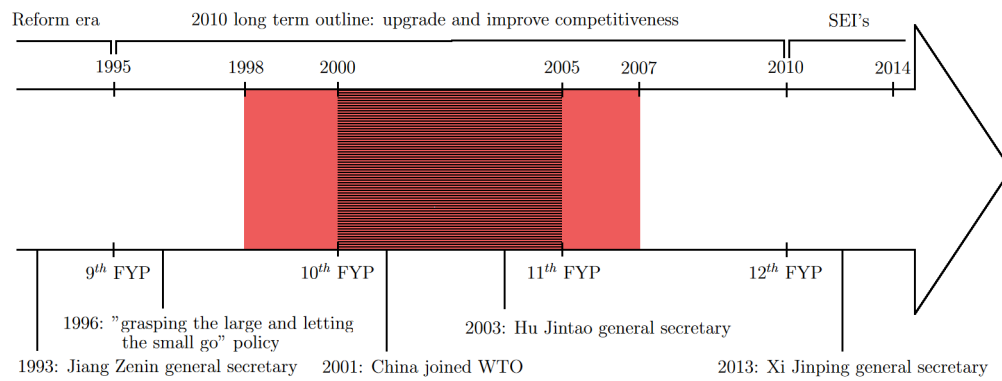


Figure 2: Timeline

Note: The red area indicates the span of our data set and the dark red area indicates the period of the 10th FYP.

3 Empirical Methodology

In this section, we describe the data set we use and the empirical methodology to explore the importance of SOEs in achieving the Chinese 10th FYP's objectives.

3.1 Data, Measures of Key Variables, and the Analytical Sample

Our main data source is the firm-level panel data from the Annual Survey of Industrial Firms (ASIF). This data set was collected by China's National Bureau of Statistics (NBS) and our sample covers the years of 1998 to 2005. This firm-level data set includes above-scale non-SOEs with nominal revenues exceeding five million yuan (around \$700,000) and all SOEs. The number of observations (establishments) ranges from about 165,000 in 1998 to about 269,000 in 2005 for around 300 four-digit Chinese industries broadly covering the mining and quarrying, manufacturing, and public utilities industries. The data set reports a very rich set of information on the firm's production and financial statements including information on output, value-added, export revenues, capital stock, the number of employees, wage payments, ownership, age, interest payment, liabilities, taxes paid, and subsidies received, among others.

We rely on the official industry classification reported by the ASIF data set and the list of supported industries described in the 10th FYP and compiled by [Chen et al. \(2022\)](#) to identify the firms that were especially supported during the 10th FYP period. [Figure 3](#) plots the number of firms by ownership status and by supported/not-supported groups. We see that the number of firms in the supported/not-supported groups follows a similar trend. However, we observe a decrease in the number of SOEs and an increase in the number of POEs across our periods. We interpret this as a consequence of the "grasping the large and letting the small go" policy as well as the "reform and opening-up" effort of the Chinese government still relevant at this period. Throughout this analysis, we mainly focus on continuing firms to not include SOEs that were planned to shut down before the start of the FYP. [Table 1](#) gives a picture of the state of our supported and not-supported industries before the start of the 10th FYP. We have 302 industries, 93 of them were supported by the 10th FYP. The not-supported industries were on average more productive, less capital-intensive, and younger than the supported industries. In both groups,

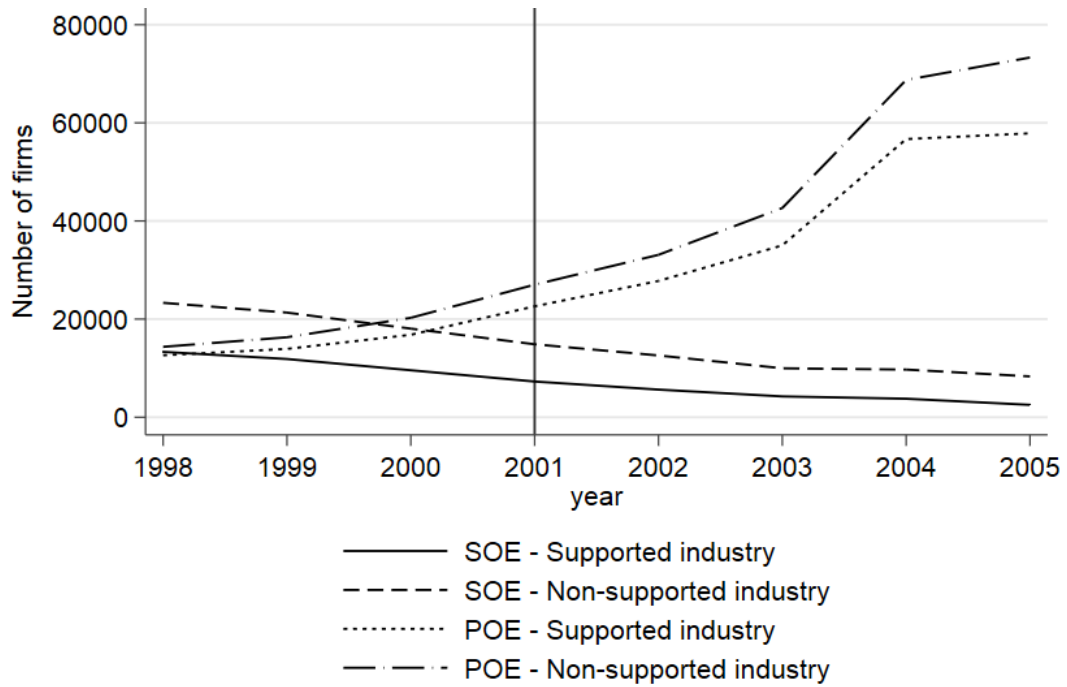


Figure 3: Number of SOEs, POEs, supported and not supported group

Note: The curves represent the number of firms in the ownership-supported group in the dataset for each year. The vertical line marks the start of the 10th FYP.

SOEs are older, less productive, and more capital-intensive and less export oriented than their private counterparts as one would expect from the literature

Table 1: Descriptive statistics for the supported and unsupported industries in 2000

	Not supported			Supported		
	ALL	POE	SOE	ALL	POE	SOE
TFP	1.747 (.298)	1.814 (.329)	1.377 (.345)	1.642 (.210)	1.725 (.308)	1.287 (.239)
Fixed Asset	28344 (59518)	24408 (60671)	45365 (145165)	26956 (36029)	24752 (45839)	42032 (65653)
Value Added	17141 (34002)	17359 (36339)	17214 (55919)	14789 (19929)	15146 (25202)	15547 (30447)
Employment	322 (360)	209 (171)	484 (935)	413 (555)	249 (284)	597 (839)
Age	17.281 (11.266)	7.984 (5.314)	30.789 (39.773)	17.418 (8.210)	8.289 (4.519)	29.101 (12.833)
Export/VA	.680 (1.051)	1.114 (1.389)	.068 (2.801)	.550 (1.152)	.799 (2.210)	.299 (.484)
N of industries	209	209	209	93	93	93

3.2 Empirical specification: A difference-in-difference approach

China focused on raising productivity in targeted industries in the 10th FYP. In this paper, we aim to assess first whether China was successful in achieving the 10th FYP's objectives, and second the role of SOEs during this process. We use total factor productivity (TFP) as our main proxy for industry productivity. Details of the productivity estimation are presented in the [appendix](#).

To answer the first question, we follow the approach by [Chen et al. \(2022\)](#) and compare the average productivity change before and after the start of the 10th FYP for the supported industries with that for the unsupported industries. Specifically, we estimate the following equation:

$$y_{s,t} = \beta_1 \text{Supported}_{s,t} + X_{s,t} \gamma + \alpha_s + \rho_t + \varepsilon_{s,t} \quad (1)$$

where $y_{s,t}$ is the average TFP level for industry s in year t . $\text{Supported}_{s,t}$ indicates whether industry s is supported by the 10th FYP in year t . The DiD includes industry fixed effects α_s , time fixed effects ρ_t and controls for the share of exports in value added, age and the share of state-owned enterprises in the industry $X_{s,t}$. The spirit of the DiD is to compare the difference between the average productivity of the industries targeted by the 10th FYP (the treated group) during the 10th FYP (treatment period: 2001-2005) and before with the difference between the average productivity of the non-targeted industries (the control group) during the 10th FYP and before. If β_1 is significantly greater than 0, it means that the 10th FYP succeeded in raising the average productivity level of the targeted industry.

We then perform a heterogeneity analysis (2) similar to the difference estimator of [Cui et al. \(2021\)](#). $y_{s,j,t}$ is the mean of TFP for an ownership type j by industry s in year t . We keep only two ownership types, POE and SOE (intermediate/mixed ownership is excluded). The coefficient β_2 should capture the difference in treatment effect between the SOE and POE subsamples obtained with equation (1). We use industry trend fixed effects $\lambda_{s,t}$, ownership trend fixed effects $\eta_{j,t}$ and the same control variables as in equation 1, $X_{s,t}$.

$$y_{s,j,t} = \beta_2 \text{Supported}_{s,t} \times \text{SOE}_j + \sigma_{s,j} + \lambda_{s,t} + \eta_{j,t} + X_{s,t}\gamma + \varepsilon_{s,j,t} \quad (2)$$

The spirit of the heterogeneity analysis is to measure how the treatment varies across the two different subgroups, the SOEs and the POEs. We introduce ownership trend fixed effects $\eta_{j,t}$ to control for the difference in trends between the two sub-groups of SOEs and POEs, and industry trend fixed effects $\lambda_{s,t}$ to control for the difference in trends between industries (the industry fixed effects then capture the treatment effect β_1 in equation 1). If β_2 is significantly greater than 0, it means that the 10th Five Year Plan had a greater effect on SOEs than on POEs.

For the covariates $X_{s,t}$. Age is commonly used to capture differences in efficiency that stem from different levels of experience, managerial ability, and production technologies (see e.g. Doms et al., 1995; Jensen et al., 2001; Hsieh and Klenow, 2014). As for exports, empirical evidence from firm-level data suggests a positive relationship between the share of exporting firms and productivity (Wagner, 2007). The exporting ratio is also intended to control the increased participation of China in world trade.

In addition to the 10th Five-Year Plan, our sample includes some of the years covered by the 9th Five-Year Plan. Of the 425 four-digit industries included in the Chinese industrial classification code, 111 were supported by the 9th Five-Year Plan. We exclude these industries to avoid confounding the effect of the 10th Five-Year Plan with that of its predecessor. We also exclude a few industries where the number of enterprises is too small (less than 10). We exclude new entrants so that our estimate captures the effect on firms that were in the sample before the start of the FYP. We also exclude exiting firms because, following the policy of 'grab the big and let the small go', many SOEs were planned to close and these closures were planned years before. Therefore, we do not expect any treatment effect on firms that are planned to close in the following years. We define a firm as type j if it is registered as type j in the dataset in 2000, to avoid bias due to ownership changes.

Before discussing the results, we recall that we construct an industry-level binary variable indicating whether a firm belongs to an industry targeted by the 10th Five Year Plan by reading

the official documents and matching industries explicitly mentioned in the documents with the corresponding four-digit industries. With these regressions, we cannot rule out the possibility that some industries in the supported group received little or no support, or that some firms in the unsupported industries received support anyway. Therefore, our estimates should be interpreted as intention to treat, i.e. the effect of being eligible to receive aid. In other words, we estimate the average effect on TFP of being assigned to the group of industries supported by the industrial policy.

4 Results

In this section, we discuss the results of regressions 1 and 2 and test their robustness. We find that the 10th FYP has increased the productivity level of the targeted industries and that this effect is stronger for SOEs.

4.1 Who benefited from the 10th Five-Year Plan?

We find that the 10th has, on average, increased the productivity level of the targeted industries. The event study (figure 4) derived from equation 1 shows that this effect was progressive over the five years. Indeed, the treatment estimator is positive but not very significant for 2001 and 2002. It then increases and becomes greater than 0 with an associated 99% coefficient interval. The event study also suggests that we have no pre-trend concerns between the treated and non-treated groups. Overall, using DiD 1, we find that the 10th FYP increased the productivity of assisted industries by 3.8% over the years (column 1 of table 2). From these results, we conclude that the Chinese government was successful in raising productivity in the targeted industries.

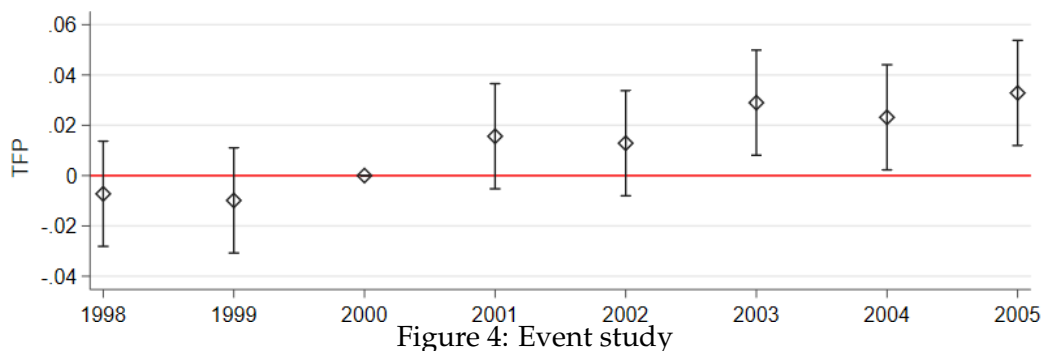
We then examine whether SOEs responded differently from POEs to the support of the 10th FYP. We run the DiD over a sample of only POEs (column 2 of table 2) and only SOEs (column 3 of table 2). We find that the 10th FYP had a positive impact on the average productivity of the assisted industries for these two subgroups. However, the coefficient captured on the subsample of POEs is the lowest with the highest p-value associated). Running the heterogeneity analysis

(2), we find that the effect of the 10th FYP was stronger for SOEs than for POEs. In other words, the average productivity of SOEs in promoted industries increased significantly more than the average productivity of POEs in promoted industries by 4%. These results show that the Chinese government has relied on both types of ownership (private and public) to achieve the goals of the 10th FYP, but has been more successful with SOEs. In section 5, we examine whether the measures implemented during the 10th FYP were primarily targeted at SOEs or whether SOEs were more responsive to these measures.

Table 2: Difference in difference and heterogeneity analysis with log(TFP) as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.023*** (0.007)	0.017* (0.010)	0.073*** (0.016)	
Supported \times SOE				0.052*** (0.018)
Observations	2,416	2,394	2,344	4,644
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Ownership FE				X
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the TFP of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP. The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only state-owned firms. In column 3, on a sample including only the privately-owned firms. Column 4 displays the result of the heterogeneity analysis (equation 2) on a sample including SOEs and POEs subsamples. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.



The lines refer to 90% confidence intervals. The regression is run at the industry-level. The year 2000 is set to zero. The sample goes from 1998 up to 2005 and excludes entering and exiting firms. Detailed can be found in appendix 6.

4.2 The case of firms with Mixed-Ownerships

In this subsection we include a new ownership category: firms with mixed-ownership, i.e. firms that are partially owned by the state and firms that are partially owned by a private entity. Even though the main mixed-ownership reform began around 2013, to improve the performance and operational efficiency of SOEs by introducing private share and private-sector practices. With the DiD and h.a. we do not find any significant effect of the 10th FYP on mixed-ownership firms' productivity (table 10).

4.3 Robustness

In this section, we plan to test the robustness of the results presented in the previous section. We want to investigate the effect of WTO accession on our estimation, run placebo tests, add and reduce the number of covariates, and run sensitivity analyse in the spirits of [Rambachan and Roth \(2023\)](#).

We find similar results with different specification for the DiD and h.a. (table 8) [complete]. We find similar results with the DiD and h.a. at the firm level (tables 13 and 14). We also find similar results with alternative definitions of SOE. We test to classify firms into 4 subgroups, firms with 0% of state capital, firms with more than 0% but less than 50% of state capital, firms with and firms with 50% or more but less than 100% of state capital. We find similar results as before, the 10th FYP has mostly increased the productivity and the added-value of firms with 100% of state-capital (tables 15, 16). We find similar results at the firm level.

5 Mechanism

5.1 How productivity increased?

We decompose the total factor productivity (TFP) outcome to see whether the positive effect of the 10th FYP on TFP is due to a change in outputs or inputs. We look at value added for the output, and fixed assets (net of depreciation) or inputs. We rerun the DiD regressions (1) and the heterogeneity analysis (2) with the mean of fixed assets or value added in industry s at time t as

the outcome variables $y_{s,t}$.

We observe no changes in the average level of fixed assets held by POEs and SOEs in the assisted industry during the 10th FYP (columns 1 and 2 of table 4). On the other hand, we observe an increase in the average value-added produced by SOEs in the supported industry during the 10th FYP (column 2 of table 5). The heterogeneity analysis (column 4 of table 4 and table 5) confirms the findings of the DiD. Those findings are robust to the introduction of Mixed-owned firms (12 and 11), and to other proxies for outputs and inputs of firms (tables 6 and 7).

5.2 Dynamic of the sample

We investigate if China increased the average added value and TFP of SOEs belonging to supported industries by introducing private capital in those firms. In 2013, the Chinese government massively introduced private shares in SOE to reform their management Liu et al. (2015). One of the goals of the 10th FYP, was to make SOEs more "market-oriented". We test if we can find the premise of the 2013 reforms between 2000 and 2005.

We do find a contraction of state capital in the supported industry (table 21). This is linked to an increase in ownership change from SOE to mixed-ownership firms and mixed-ownership firms to POE in the supported industries. We also observe a contraction of the number of new SOE and new mixed-ownership firms (tables 17). It seems that the Chinese government has reduced its control and its involvement in the industries supported by the 10th FYP. The context of the "grab the big and let the small go" policy is important here as the number of SOEs is decreasing in all industries during this period (figures 5 and 6). However, this effort of opening the Chinese economy to the private sector has been stronger in the industries supported by the 10th FYP.

We finally wonder if the positive effect of the 10th FYP on SOE's productivity and production has been driven by SOEs transformed into mixed-ownership firms. In tables 19 and 20, we divide the SOEs group into two subgroups, SOEs that remained SOEs during our sample period and SOEs that became mixed-owned firms. We do find a positive effect of the 10th FYP on SOEs transformed into mixed-owned firms. However, we still find a positive effect of the 10th FYP on SOEs that remained SOEs during our sample period.

When the public retreat, the private advance. Between 2000 and 2005, China increased the share of private capital in the industry supported by the 10th FYP with the hope of increasing their productivity. We do observe a success for SOEs turned into firms with mixed ownership but we observe similar features for SOEs that have stayed SOEs. Overall, if we can conclude that introducing state capital to develop strategic SOEs was already a strategy before the 2013 mixed-ownership reform, we cannot conclude that without the introduction of state capital, SOEs would have less performed between 2000 and 2005. In addition, we also find that the 10th FYP has increased the number of firms in the industry supported (with a heterogeneous effect on the ownership type, see table 17).

5.3 How China implemented its industrial policy

We want to examine how China has managed to raise productivity in targeted industries. We consider two channels through which the Chinese government may have influenced firms' behavior. First, through financial incentives (subsidies, access to credit, tax cuts...). In this respect, we want to know whether some firms enjoyed privileged access to financial resources. Second, the Chinese government may have used its influence over SOEs through its ownership to influence their economic decisions.

We start to wonder if we can find a difference in access to financial resources based on the ownership type during the 10th FYP. We run a probit model based on equation (3) where $\text{Subsidy}=1$ if establishment i received subsidies at time t . β_1 is the coefficient of interest, it captures the effect of belonging to a supported industry s during the 10th. We introduce the industry fixed effect δ_s , year fixed effect θ_t and the control variable of the DiD $X_{i,t}$ (age, ratio of SOEs in the industry and the ratio export/value-added). We run the probit model over a sample including all firms, only SOEs, and only POEs. We then run a heterogeneity analysis (equation 4) to assess if SOEs in supported industries had a higher probability to receive a subsidy than POEs in supported industries. β_2 is the coefficient of interest, it should capture the difference in treatment between POEs and SOEs. We introduce industry-ownership fixed effect $\sigma_{s,j}$, ownership-year fixed effect $\theta_{j,t}$, industry-year fixed effect $\lambda_{s,t}$, and the control variables of the DiD $X_{i,t}$.

$$\text{PR}(\text{Subsidy}_{i,s,t} = 1) = \Phi(\beta_0 + \alpha_s + \rho_t + \beta_1 \text{Supported}_{s,t} + X_{i,t}) \quad (3)$$

$$\text{PR}(\text{Subsidy}_{i,j,s,t} = 1) = \Phi(\beta_0 + \sigma_{s,j} + \lambda_{s,t} + \eta_{j,t} + \beta_2(\text{Supported}_{s,t} \times \text{SOE}_j + X_{i,t})) \quad (4)$$

We find that more than 70% of firms have received at least once a public subsidy during the 10th FYP (table 22). This figure is rather stable across ownership types and industries. With the probit model (equation 3), we find that belonging to a treated industry increases the chance to receive a public subsidy by 1.1 p.p. (column 1 of table 23). We then find no effect when we run the probit model over a sample including POEs only, but we do find a positive effect when we run it over a sample including POEs only (columns 2 and 3 of table 23). The heterogeneity analysis however does not capture a difference in treatment between SOEs and POEs (columns 4 of table 23). Those findings are robust to ols specification with firm FE (table 24).

With the tax on product sales as the outcome variable, we find that belonging to a treated industry decreases the chance to pay a tax on product sales by 2.3 p.p. (column 1 of table 25). The heterogeneity analysis however does not capture a difference in treatment between SOEs and POEs (columns 4 of table 25). Those findings are not robust to ols specification with firm FE though (table 26).

We then want to assess if the Chinese government has “picked winners”. That is: does the Chinese government has targeted the most productive firms? We create two sub-groups, one composed of the firms that were in the top 10% of the TFP distribution in 1999 and one composed of the firms that were in the bottom 10% of the TFP distribution in 1999. We then perform DiD (1), heterogeneity analysis (2), and the two probit models (equations 3 and 4) to assess the impact of the 10th FYP on these two subgroups and the potential difference between the two. We find that the impact of the 10th FYP was particularly large for the least productive establishments. These findings contradict Chen et al.’s suggestion that “the impact of the 10th FYP was higher for the top 10% most productive enterprises in 1999”. We find that there were more SOEs in the bottom 10% of the TFP distribution in 1999.

6 Conclusion

The Chinese government wanted to "optimize and upgrade the industrial structure and improve international competitiveness". To achieve this, it targeted a number of industries for development. These industries should be the locomotive of the Chinese economy, account for a significant share of total value added, and be productive enough to compete with international standards. To achieve its goal, China has prioritized state-owned enterprises. We find that firms owned by the state have had greater access to public subsidy which allows them to increase their productivity and their production level.

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Appendix

TFP computation

The total factor productivity (TFP) is computed as in Chen et al. (2022) TFP_{si} is the total revenue productivity of the firm i belonging to the industry s . k_{si} as the book value of fixed capital net of depreciation. For $(wL)_{si}$, we assume that the sum of the imputed benefits and wages – the non-wage compensation absent from the survey – equals 50% of the value-added. For the moment, we use a secondary measure of $1 - \alpha_s$ where we use a fixed labor share of 0.65 across industries and time as in Gopinath et al. (2017).

$$TFP_{si} = \frac{P_{si} Y_{si}}{K_{si}^{\alpha_s} (wL)_{si}^{1-\alpha_s}}$$

Event-Study

The estimated event-study equation is given by:

$$y_{s,t} = \alpha_s + \rho_t + \sum_{m=4}^3 \beta_m \text{Supported}_{s,t-m} + u_{s,t} \quad (5)$$

With $y_{s,t}$ the mean of TFP of the industry s in year t . We introduce industry fixed-effects α_s and year fixed-effect ρ_t . "Supported" record the time period t in which the 10th FYP is implemented for the industries supported by the plan. The values of the lags, 3, and leads, 4, are determined by data availability (i.e. $m=3$ corresponds to 1998 and $m=4$ corresponds to 2005). The coefficients $\{\beta\}_{m=-4}^3$ trace out the changes in the relationship between the outcome $y_{s,t}$ variable and the event industries (supported) relative to the not supported.

Figures

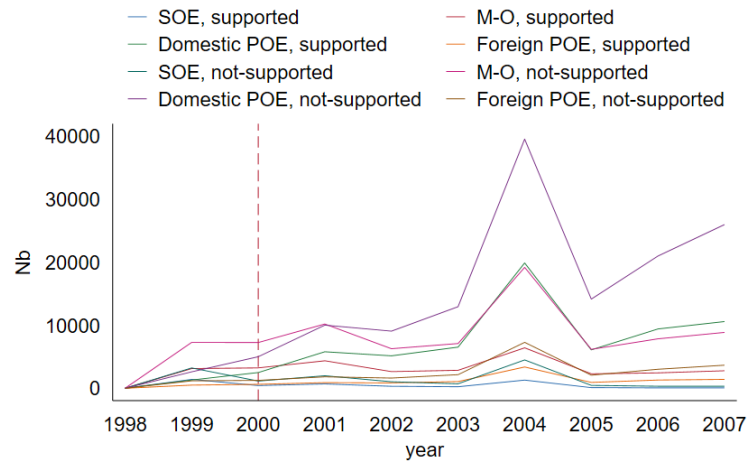


Figure 5: Number of new observations according to the ownership

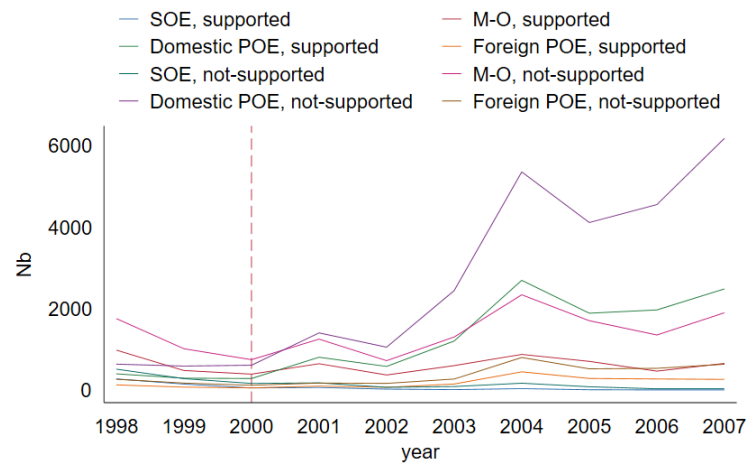


Figure 6: Number of firms newly created according to the ownership

Tables

Background

Table 3: SOEs evolution 1997-2016

Year	No. of SOEs (Thousand)	Total Assets (Billion)	Total Liabilities (Billion)	Sales (Billion)	Net Income (Billion)	Lev %	ROA %	ROE %
1997	262	12,497.5	7881.06	6813.20	79.12	67.10	2.30	1.70
1998	238	13,478.0	8440.93	6468.51	21.37	65.50	2.10	0.40
1999	217	14,528.8	9147.49	6913.66	114.58	65.40	2.70	2.10
2000	191	16,006.8	10,209.24	7508.19	283.38	66.00	3.30	4.90
2001	174	16,671.0	10,527.33	7635.55	281.12	65.00	3.30	4.60
2002	159	18,021.9	11,367.58	8532.60	378.63	64.80	3.60	5.70
2003	146	19,971.0	12,871.89	10,016.09	476.94	65.90	3.50	6.70
2004	136	21,560.2	13,883.91	12,072.20	736.88	65.70	4.50	9.60
2005	126	24,256.0	15,517.32	14,072.66	957.99	65.10	5.00	11.00
2006	117	27,730.8	17,929.37	16,239.03	1219.35	67.40	5.50	12.40
2007	112	34,706.8	20,247.25	19,483.53	1744.18	68.70	6.40	12.10
2008	110	41,621.9	25,000.84	22,939.79	1333.52	61.60	4.60	8.00
2009	111	51,413.7	31,541.69	24,301.54	1560.68	62.80	4.20	7.90
2010	113	64,021.4	40,604.32	31,499.39	2142.82	63.40	4.60	9.20
2011	135	75,908.2	48,609.08	38,634.14	2466.98	64.00	4.60	9.00
2012	147	89,489.0	57,513.54	42,535.65	2427.73	64.30	4.10	7.60
2013	156	104,094.7	67,097.46	47,112.51	2557.39	64.50	3.80	6.90
2014	160	118,471.5	76,595.59	48,909.91	2644.40	64.70	3.50	6.30
2015	167	140,683.2	92,441.72	45,735.20	2497.04	65.70	2.90	5.20
2016	173	154,914.2	101,521.49	47,439.16	2555.87	65.50	2.70	4.80

Data: Ministry of Finance of China.

How productivity increased

Table 4: Difference in difference and heterogeneity analysis with log(fixed asset) as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.010	0.038	-0.014	
	(0.024)	(0.037)	(0.037)	
Supported \times SOE				-0.066
				(0.060)
Observations	2,416	2,396	2,350	4,660
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Ownership FE				X
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the TFP of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only state-owned firms. In column 3, on a sample including only the privately-owned firms. Column 4 displays the result of the heterogeneity analysis (equation 2) on a sample including top and bottom subsamples. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Difference in difference and heterogeneity analysis with log(value-added) as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.019 (0.034)	0.022 (0.054)	0.165*** (0.037)	
Supported \times SOE				0.123* (0.063)
Observations	2,416	2,388	2,325	4,594
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Ownership FE				X
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the value-added of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only state-owned firms. In column 3, on a sample including only the privately-owned firms. Column 4 displays the result of the heterogeneity analysis (equation 2) on a sample including top and bottom subsamples. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Difference in difference and heterogeneity analysis with log(real output) as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.021 (0.022)	0.026 (0.030)	0.111** (0.048)	
Supported \times SOE				0.064 (0.056)
Observations	2,416	2,388	2,325	4,594
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Ownership FE				X
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the real output of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only state-owned firms. In column 3, on a sample including only the privately-owned firms. Column 4 displays the result of the heterogeneity analysis (equation 2) on a sample including top and bottom subsamples. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Difference in difference and heterogeneity analysis with log(employment output) as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	-0.039** (0.019)	-0.051* (0.026)	0.062* (0.036)	
Supported \times SOE				0.111*** (0.043)
Observations	2,416	2,388	2,325	4,594
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Ownership FE				X
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of employment of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only state-owned firms. In column 3, on a sample including only the privately-owned firms. Column 4 displays the result of the heterogeneity analysis (equation 2) on a sample including top and bottom subsamples. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Difference in difference and heterogeneity analysis with log(real output) as outcome variable

	(1)	(2)	(3)	(4)	(5)	(6)
	DiD	DiD	h.a	h.a	h.a	h.a
Supported	0.033*** (0.012)	0.037*** (0.009)	0.016 (0.011)		0.016 (0.011)	
Supported \times SOE			0.056*** (0.018)	0.053*** (0.018)	0.056*** (0.018)	0.052*** (0.018)
Post2000 \times SOE			-0.022** (0.010)	-0.020* (0.010)		
Observations	4,740	4,738	4,738	4,644	4,738	4,644
Industry FE	X					
Year FE	X	X	X			
Industry-Ownership FE		X	X	X	X	X
Industry-Year FE				X		X
Ownership-Year FE					X	X

The two first columns present the result of a difference in difference (DiD) regression. The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of TFP of the ownership-type j in industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP. Columns 3 to 6 displays the result of the heterogeneity analysis (equation 2). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, the proportion of SOEs in the industry by year, and a dummy "Post2000 \times SOE"=1 if the observation is made on SOEs after 2000. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Difference in difference and heterogeneity analysis with log(TFP) as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(Bottom)	(Top)	(ALL)
Supported	0.024*** (3.72)	0.043** (2.33)	-0.017 (-1.08)	
Supported \times Bottom				0.061** (2.56)
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-year FE				X
Top-year FE				X
N	2,416	2,244	2,280	4,524

The three first columns present the result of a difference in difference (DiD) regression (equation 1). It is run at the industry level, the sample goes from 1998 up to 2005. I run the regression on a sample excluding entering and exiting firms. The outcome variable is the log of the TFP of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the firm at the bottom 10% of the TFP distribution in 1999. In column 3, on a sample including only the top 10% of the TFP distribution in 1999. Column 4 displays the result of the heterogeneity analysis (equation 2) on a sample including top and bottom subsamples. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Difference in difference and heterogeneity analysis with log(TFP) as outcome variable

	(1)	(2)	(3)	(4)	(5)
	(ALL)	(POE)	(SOE)	(MO)	(ALL)
Supported	0.024*** (0.007)	0.013 (0.010)	0.066*** (0.015)	0.005 (0.009)	
Supported \times MO					-0.008 (0.018)
Supported \times SOE					0.052*** (0.016)
Observations	2,416	2,390	2,343	2,375	7,094
Industry FE	X	X	X	X	
Year FE	X	X	X	X	
Industry-Ownership FE					X
Industry-Year FE					X
Ownership-Year FE					X

The four first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the TFP of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the privately-owned firms. In column 3, on a sample including only state-owned firms. In column 4, on a sample including only firms with mix-ownership. Column 5 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: Difference in difference and heterogeneity analysis with log(value-added) as outcome variable

	(1)	(2)	(3)	(4)	(5)
	(ALL)	(POE)	(SOE)	(MO)	(ALL)
Supported	0.017	0.003	0.132***	0.026	
	(0.025)	(0.034)	(0.050)	(0.032)	
Supported \times MO					0.015
					(0.063)
Supported \times SOE					0.126**
					(0.058)
Observations	2,416	2,387	2,324	2,371	7,067
Industry FE	X	X	X	X	
Year FE	X	X	X	X	
Industry-Ownership FE					X
Industry-Year FE					X
Ownership-Year FE					X

The four first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the value-added and value-added of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the privately-owned firms. In column 3, on a sample including only state-owned firms. In column 4, on a sample including only firms with mix-ownership. Column 5 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: Difference in difference and heterogeneity analysis with log(fixed asset) as outcome variable

	(1)	(2)	(3)	(4)	(5)
	(ALL)	(POE)	(SOE)	(MO)	(ALL)
Supported	0.005	0.027	-0.041	0.012	
	(0.024)	(0.038)	(0.047)	(0.033)	
Supported \times SOE					-0.029
					(0.062)
Supported \times MO					-0.062
					(0.057)
Observations	2,416	2,395	2,349	2,375	7,105
Industry FE	X	X	X	X	
Year FE	X	X	X	X	
Industry-Ownership FE					X
Industry-Year FE					X
Ownership-Year FE					X

The four first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the fixed-asset and value-added of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the privately-owned firms. In column 3, on a sample including only state-owned firms. In column 4, on a sample including only firms with mix-ownership. Column 5 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 13: Difference in difference and heterogeneity analysis with $\log(\text{TFP})$ as outcome variable, firm-level

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.006 (0.007)	-0.003 (0.006)	0.024* (0.013)	
Supported \times SOE				0.015*** (0.005)
Observations	304,445	216,061	88,357	304,439
Firm FE	X	X	X	X
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the TFP of the firm i in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the privately-owned firms. In column 3, on a sample including only state-owned firms. Column 4 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 14: Difference in difference and heterogeneity analysis with log(value-added) as outcome variable, firm-level

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.016	-0.025	0.099***	
	(0.021)	(0.017)	(0.034)	
Supported \times SOE				0.047***
				(0.012)
Observations	306,886	217,581	89,278	306,880
Individual FE	X	X	X	X
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the value-added of the firm i in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the privately-owned firms. In column 3, on a sample including only state-owned firms. Column 4 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

6.1 Dynamic of the sample

Table 15: Difference in difference and heterogeneity analysis with $\log(\text{TFP})$ as outcome variable

	(1)	(2)	(3)	(4)	(5)	(6)
	(ALL)	(0%)	(< 50%)	(> 50%)	(100%)	(ALL)
Supported	0.024*** (0.007)	0.020 (0.012)	-0.010 (0.024)	0.006 (0.022)	0.061*** (0.023)	
Supported \times < 50%						-0.001 (0.026)
Supported \times > 50%						0.040 (0.027)
Supported \times 100%						0.045* (0.025)
Observations	2,416	2,402	2,051	2,002	2,319	8,748
Industry FE	X	X	X	X	X	
Year FE	X	X	X	X	X	
Industry-Ownership FE						X
Industry-Year FE						X
Ownership-Year FE						X

The five first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the value-added of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the firms with 0% of state capital. In column 3, on a sample including only the firms with more than 0% but less than 50% of state capital. In column 4, on a sample including only the firms with more than 50% but less than 100% of state capital. In column 5, on a sample including only firms with 100% of state-capital or more. Column 6 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 16: Difference in difference and heterogeneity analysis with log(value-added) as outcome variable

	(1)	(2)	(3)	(4)	(5)	(6)
	(ALL)	(0%)	(< 50%)	(> 50%)	(100%)	(ALL)
Supported	0.024*** (0.007)	0.020 (0.012)	-0.010 (0.024)	0.006 (0.022)	0.061*** (0.023)	
Supported \times < 50%						-0.001 (0.026)
Supported \times > 50%						0.040 (0.027)
Supported \times 100%						0.045* (0.025)
Observations	2,416	2,402	2,051	2,002	2,319	8,748
Industry FE	X	X	X	X	X	
Year FE	X	X	X	X	X	
Industry-Ownership FE						X
Industry-Year FE						X
Ownership-Year FE						X

The five first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the value-added of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP (supported) after the implementation of the 10th FYP (Post2000). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only the firms with 0% of state capital. In column 3, on a sample including only the firms with more than 0% but less than 50% of state capital. In column 4, on a sample including only the firms with more than 50% but less than 100% of state capital. In column 5, on a sample including only firms with 100% of state-capital or more. Column 6 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 17: Difference in difference with the number of new entry as outcome variable

	(1) Entry	(2) New	(3) Other
ALL	49.942*** (9.260)	6.329*** (1.526)	40.694*** (8.147)
SOE	-1.695*** (0.653)	-0.956*** (0.123)	-1.431** (0.616)
MO	2.841 (1.800)	-0.701** (0.325)	1.796 (1.629)
Domestic POE	37.341*** (6.138)	6.094*** (1.142)	31.111*** (5.320)
Foreign POE	4.396*** (1.309)	0.778*** (0.221)	3.464*** (1.142)
N	4,255	4,255	4,255

The table presents the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the number of new firms in the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP. The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In line 1, the outcome variable is the number of new firms. In line 2, the outcome variable is the number of new state-owned enterprises. In line 3, the outcome variable is the number of new firms with mixed ownership. In line 4, the outcome variable is the number of new domestic privately-owned enterprises. In line 5, the outcome variable is the number of new foreign privately-owned enterprises. In column 1, we count the number of new firms. In column 2, the number of firms newly created. In column 3, the number of new firms that are not newly created. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 18: Difference in difference and heterogeneity analysis with the number of ownership-change as outcome variable

	(1) Total	(2) SOE-MO	(3) SOE-POE	(4) MO-SOE	(5) MO-POE	(6) POE-SOE	(7) POE-MO
Supported	2.158*** (0.772)	0.252** (0.111)	0.258*** (0.065)	0.188*** (0.047)	2.625*** (0.407)	-0.246** (0.097)	-0.919** (0.404)
N	2,424	2,424	2,424	2,424	2,424	2,424	2,424

The table presents the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the number of ownership change in the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP. "SOE" stands for State-Owned enterprises, "MO" stands for mixed-ownership, "POE" stands for Private-Owned Enterprise. In column 1 to 7, $x - y$ stands for a DiD where the outcome variable is the number of ownership change from x to y . The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 19: Difference in difference and heterogeneity analysis with log(TFP) as outcome variable

	(1)	(2)	(3)	(4)	(5)
	(ALL)	(POE)	(SOE)	(SOE-MO)	(ALL)
Supported	0.032*** (0.008)	0.018* (0.010)	0.070*** (0.016)	0.038** (0.018)	
Supported \times SOE					0.054*** (0.020)
Supported \times SOE-MO					0.046** (0.023)
Observations	2,416	2,394	2,306	1,978	6,596
Industry FE	X	X	X	X	
Year FE	X	X	X	X	
Industry-Ownership FE					X
Industry-Year FE					X
Ownership-Year FE					X

The four first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the TFP of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP (Supported). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only privately-owned enterprises. In column 3, on a sample including only state-owned enterprises that have not change their ownership during the sample period. In column 4, on a sample including only state-owned enterprises that became firms with mixed-ownership during the sample period. Column 5 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 20: Difference in difference and heterogeneity analysis with log(value-added) as outcome variable

	(1)	(2)	(3)	(4)	(5)
	(ALL)	(POE)	(SOE)	(SOE-MO)	(ALL)
Supported	0.047	0.017	0.064	0.141**	
	(0.030)	(0.033)	(0.054)	(0.056)	
Supported \times SOE					0.049
					(0.068)
Supported \times SOE-MO					0.107
					(0.078)
Observations	2,416	2,394	2,306	1,978	6,596
Industry FE	X	X	X	X	
Year FE	X	X	X	X	
Industry-Ownership FE					X
Industry-Year FE					X
Ownership-Year FE					X

The four first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the TFP of the industry s in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP (Supported). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only privately-owned enterprises. In column 3, on a sample including only state-owned enterprises that have not change their ownership during the sample period. In column 4, on a sample including only state-owned enterprises that became firms with mixed-ownership during the sample period. Column 5 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 21: Difference in difference and heterogeneity analysis with log(state-capital) as outcome variable

	(1)	(2)
	DiD	DiD
	(Industry)	(Firm)
Supported	-0.019***	-0.015***
	(0.004)	(0.002)
Observations	2,416	460,754
Industry FE	X	X
Year FE	X	X

The table presents the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. In column 1, the outcome variable is the log of the average state-capital in the industry s in year t . In column 2, the outcome variable is the log of the state-capital in the firm i in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP (Supported). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. FEs are indicated at the bottom. Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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Table 22: Ratio of subsidized firms during the 10th FYP

<i>Subsidy</i> _{<i>i,t</i>}	SOE ratio	POE ratio	supported ratio	not supported
0	71%	75%	72%	73%
1	29%	25%	28%	27%

*Subsidy*_{*i,t*} = 1 if the firm has received a subsidy between 2001 and 2005. Each column display the ratio of firm having received a subsidy over the total number of firms. The first cell shows that 71% of SOEs have received a subsidy at least once between 2001 and 2005.

Table 23: Probit regression with public subsidy received as outcome variable, marginal effect

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.011***	0.003	0.031***	
	(0.002)	(0.003)	(0.005)	
Supported \times Ownership				0.003
				(0.007)
Observations	463,888	221,273	93,735	313,749
Firm FE	X	X	X	X
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Year FE				X
Ownership-Year FE				X

The table presents the result of the probit regression (equations 3 and 4). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is a dummy variable =1 if the firm i has received a subsidy in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP (Supported). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only privately-owned enterprises. In column 3, on a sample including only state-owned enterprises that have not change their ownership during the sample period. In column 4, on a sample including only state-owned enterprises that became firms with mixed-ownership during the sample period. FEs are indicated at the bottom. Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 24: Difference in difference and heterogeneity analysis with log(subsidy) as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.049*	-0.007	0.147***	
	(0.027)	(0.055)	(0.047)	
Supported \times SOE				0.057 (0.084)
Observations	464,254	93,915	221,586	315,529
Firm FE	X	X	X	X
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the subsidy received by the firm i in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP (Supported). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only privately-owned enterprises. In column 3, on a sample including only state-owned enterprises that have not change their ownership during the sample period. In column 4, on a sample including only state-owned enterprises that became firms with mixed-ownership during the sample period. Column 5 displays the result of the heterogeneity analysis (equation 2). FEs are indicated at the bottom. Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 25: Probit regression with tax on product sales paid as outcome variable, marginal effect

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	-0.023*** (0.008)	-0.023* (0.012)	-0.127*** (0.020)	
Supported \times SOE				-0.145*** (0.028)
Observations	464,348	221,650	93,847	314,674
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of the probit model (equation 1). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is a dummy=1 if the firm i has paid a tax on product sales in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP (Supported). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only privately-owned enterprises. In column 3, on a sample including only state-owned enterprises that have not change their ownership during the sample period. Column 4 displays the result of the heterogeneity analysis of the probit model (equation 2). FEs are indicated at the bottom. Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 26: Difference in difference and heterogeneity analysis with $\log(\text{tax on product sales})$ as outcome variable

	(1)	(2)	(3)	(4)
	(ALL)	(POE)	(SOE)	(ALL)
Supported	0.006 (0.057)	-0.023 (0.050)	0.036 (0.089)	
Supported \times SOE				0.029 (0.025)
Observations	199,421	123,934	75,468	199,403
Firm FE	X	X	X	X
Industry FE	X	X	X	
Year FE	X	X	X	
Industry-Year FE				X
Ownership-Year FE				X

The three first columns present the result of a difference in difference (DiD) regression (equation 3). The sample goes from 1998 up to 2005 and excludes entering and exiting firms. The outcome variable is the log of the tax on product sales paid by the firm i in year t . The coefficient of interest captures the impact of being an industry supported by the 10th FYP after the implementation of the 10th FYP (Supported). The covariates include the average age of the firms and the ratio of exports to value-added by industry and by year, and the proportion of SOEs in the industry by year. In column 1, the regression is run on the whole sample. In column 2, on a sample including only privately-owned enterprises. In column 3, on a sample including only state-owned enterprises that have not change their ownership during the sample period. Column 4 displays the result of the heterogeneity analysis (equation 4). FEs are indicated at the bottom. Industries are weighted by the number of firms relative to the total number of firms in the sample in year t . Robust standard errors, p-values: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.