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The Impact of State-Owned Enterprises on China's Economic Growth

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Abstract

This paper considers the impact of state-owned enterprises on economic growth in China. We consider several possible channels through which state-owned enterprises might play a pro-growth role: first, stabilizing growth in economic downturns by carrying out massive investments; second, promoting technical progress by investing in riskier areas of technology; third, by following a high-road approach to treating workers by paying a living wage which is favorable for China to move toward a more sustainable growth model in the future. Our empirical analysis finds that a higher share of state-owned enterprises is favorable to long-run growth and tends to offset the adverse effect of economic downturns on the regional level.

JEL Classification: E11, O47, P31

Keywords

state-owned enterprises, economic growth, stabilizer, Chinese economy

1. Introduction

State-owned enterprises (SOEs) have played an important role in the Chinese economy. By SOEs, we refer both to state-owned enterprises and state-holding corporations, not including state-owned or state-holding financial institutions. In 2015, the total profits of SOEs reached 2.3 trillion yuan, which accounted for 13.2 percent of the total operating surplus in the whole economy. SOEs' role is even more important in taxes. In 2015, taxes from SOEs accounted for 30.9 percent of China's total tax income (SASAC 2016; NBS 2017). In China's industrial sector for which more data are available,[1] SOEs accounted in 2015 for 38.8 percent of assets, 21.8 percent of revenue, 17.2 percent of profits, and 18.2 percent of employment (NBS 2017). In 2015, the

[1]In China, the industrial sector refers to the sum of mining, manufacturing, and production and distribution of electricity, gas, and water.

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pre-tax profits of China's SOE sector were roughly one half of the amount of pre-tax profits in the US non-financial corporate sector (BEA 2017).

In this paper, we investigate the impact of SOEs on China's economic growth. While a sole focus on GDP growth is not desirable for a developing country, a high but sustainable output growth rate is an important goal. This paper finds evidence that a large share of SOEs has a positive impact on long-run GDP growth and also on macroeconomic stability.

The growth effect of SOEs has always been controversial in the literature. Conventional wisdom suggests that SOEs reduce economic growth because they are inefficient on the micro level (e.g., Chen and Feng 2000; Lin and Liu 2000; Brandt and Zhu 2010), or they absorb scarce resources that could be used more efficiently by private enterprises (e.g., Jefferson 1998). We argue that there are major deficiencies in both the empirical and theoretical aspects of the conventional wisdom.

First, the conventional wisdom has not taken into account the difference in working hours between SOEs and private enterprises when it compares micro efficiencies based on labor productivity or total factor productivity. Working overtime is far more common in private enterprises than in SOEs in China. According to the Sixth National Survey on Workers' Conditions, conducted by the All-China Federation of Trade Unions in 2006, the working week (i.e., working hours per week) was 46.14 hours in SOEs, compared to 53.16 hours in private enterprises (ACFTU 2010).[2] Measuring labor input by the number of workers instead of working hours will overestimate the micro efficiency of private enterprises relative to that of SOEs.

Second, the conventional wisdom conflicts with the evidence that SOEs have performed quite well in promoting technical progress, which we present in Section 3.3 below. Technical progress plays a central role in economic growth.

Third, enterprise efficiency is a micro issue, but economic growth is a macro process. One cannot tell whether enterprises are favorable for economic growth on the basis of micro efficiency. Greater micro efficiency means higher potential profitability, but a series of conditions have to be met in order to transform potential profitability into sustainable and rapid economic growth, among which sufficient demand, technical progress, and the reproduction of labor power are most important. Although SOEs might be less profitable than private enterprises, they can create economy-wide positive externalities that promote economic growth. For instance, Bai et al. (2000) argued that SOEs provide a social safety net to the unemployed, which is important to social stability and the productivity of the whole economy. Lo and Zhang (2010) and Lo and Li (2011) argued that SOEs are the institutional basis of the Kaldor-Verdoorn effect that has promoted productivity growth in China.

In this paper, we argue that SOEs have played a pro-growth role in the Chinese economy in several ways: first, SOEs play the role of an economic stabilizer, offsetting the adverse effect of economic downturns;[3] second, SOEs promote technical progress by carrying out investments in risker technical areas. In addition, SOEs have established a high-road approach to treating workers by providing workers with a living wage, which is crucial for the reproduction of labor power. We suggest that this high-road approach has a potential pro-growth role, which is favorable for the transition of the Chinese economy to a more sustainable growth model in the near future. SOEs appear to be less profitable than private enterprises; however, the higher profitability of private enterprises to a large extent results from the intense exploitation of their workers. If the profits of private enterprises are invested, the result is growth—but profits of private enterprises also go to dividends and non-productive uses such as speculative purchase of existing assets.

[2]The normal working week stipulated by China's Labor Law is forty-four hours.

[3]Some economists believe that long-run growth is independent of cyclical behavior. We reject this view. A recession, or slowdown in growth, can reduce the long-term growth rate of an economy.

This line of argument motivates an examination of the data to determine whether SOEs are associated with faster growth. We use a fixed-effect model to estimate the effect of SOEs on regional economic growth.

In what follows, this paper is organized into four sections. Section 2 is a literature review. Section 3 discusses possible ways in which SOEs in China contribute to economic growth. Section 4 empirically examines the effect of SOEs on economic growth. Section 5 concludes the paper.

2. Literature Review: Is There a Consensus?

The theoretical literature concentrates on micro efficiency rather than the growth effect of SOEs. Zhang (1995) and Zhou (2000) suggest that SOEs are inefficient at the micro level due to the principal-agent problem and the soft-budget problem. However, given the separation of ownership from management, all modern enterprises have to confront the principal-agent problem. The typical large corporation in capitalist economies is operated by hired managers, not by the distant shareholders that own it. The problem of how to make top managers act in the interest of the ultimate owners is common to all large organizations. The soft-budget problem arises in the private sector of capitalist countries as well, such as the government bailouts of only large financial institutions and large non-financial firms, such as General Motors and Chrysler during the 2008 financial crisis. State ownership of enterprises is not the underlying cause of the soft-budget problem, since this problem may also occur in private firms when the state serves private capital's interests.[4] Hence, the arguments claiming SOEs are inefficient can also serve to demonstrate that private enterprises are inefficient. In this sense, these arguments have failed to show the causality between state ownership and micro efficiency. On the other hand, Kaldor (1980) suggests that public firms could overcome the deficiencies derived from private firms' shortsighted behaviors. Chang and Singh (1993) maintain that public firms could create a better environment for investments through mobilizing savings and stimulating investments.

In empirical studies, cross-country studies have obtained mixed results for the impact of SOEs on economic growth. Fowler and Richards (1995) and Jalilian and Weiss (1997) find that SOEs have no significantly adverse effect on economic growth in either developed or developing economies. Doamekpor (1998) and Zhu (2005) find that SOEs significantly contribute to economic growth. Cook and Uchida (2003) find that privatization of SOEs has a significantly negative effect on the economic growth of sixty-three developing economies over the period 1988–97. On the other hand, Plane (1997), Barnett (2000), and Gylfason, Herbertsson, and Zoega (2001) find that privatization has a significantly positive effect on economic growth, suggesting that SOEs are unfavorable to economic growth.

The results of empirical studies on China are also mixed. A closer look at these studies finds some of these results are not robust or consistent, due to econometric issues. Chen and Feng (2000) find that SOEs are unfavorable to economic growth in cross-sectional regressions, using regional data, and attribute this adverse effect to SOEs' micro inefficiency. However, compared to panel regressions, cross-sectional regressions may obtain inconsistent results, due to unobserved variables. Lin and Liu (2000) adopt a fixed-effect model to improve consistency and find that a larger share of private enterprises was favorable to economic growth. Although their regional panel data cover a relatively long period ($N = 31$, $T = 24$), no unit root test is carried out in their study. Some other studies apply the same econometric method as Lin and Liu (2000)

[4]A possible soft budget constraint may be a bigger problem for the case of SOEs than for troubled private companies. SOEs often have a strong claim on state resources, and while states do bail out big companies at times, the managers of a big private company cannot be certain that state support will be provided when needed.

and confirm the negative effect of SOEs (e.g., Phillips and Shen 2005). Due to the lack of unit root tests, these results possibly suffer from spurious regressions. Furthermore, not all these regressions have controlled both region and year fixed effects.

In a related study on entrepreneurship, Li et al. (2012) use the share of private enterprises in total employment to measure entrepreneurship and find that this measure has a positive effect on economic growth. In this study, the authors apply the generalized method of moments (GMM) to regional panel data ($N = 31$, $T = 31$) without reporting the number of instruments. It is noteworthy that GMM is less reliable when the size of the panel is relatively small (Bazzi and Clemens 2013). On the other hand, Huang, Li, and Lotspeich (2010) argue that SOEs could contribute to social stability by preventing massive unemployment, which could offset SOEs' micro inefficiency. Using the regional panel data covering the period 1992–2007, they find no significant difference between the effects of SOEs and private enterprises on economic growth. In their estimations, they take two-year or three-year averages based on the data, so their regional panel is shorter, and they control both region and year fixed effects.

There is no consensus in the literature on the growth effect of SOEs. The theoretical studies have emphasized the principal-agent problem and the soft-budget problem but fail to establish causality between state ownership and these problems. In contrast to these studies, we focus on the macro efficiency instead of micro efficiency. We emphasize that SOEs are embedded in the specific institutions that make SOEs behave in a distinct way. These behaviors may appear inefficient at the micro level but support economic growth at the macro level. The inconsistency between micro and macro efficiencies can be traced back to Marx and Keynes. The current empirical literature is not sufficient to provide a solid answer to the question we are addressing, due to econometric issues. These studies are mostly focused on the contemporaneous effect of SOEs. This paper instead examines both the contemporaneous and the long-term effects, since the macro effect on growth can only be observed in the long run. This paper also explicitly examines the effect of SOEs in countering economic downturns, which has implications for long-term growth.

3. How SOEs Can Promote Economic Growth

SOEs can promote economic growth in several ways. First, SOEs maintain and raise investments and thus aggregate demand in economic downturns when private enterprises reduce their investments. Thus, SOEs stabilize economic growth and reduce the damage of economic downturns. Second, along with investments, SOEs carry out major technical innovations that private enterprises are reluctant to do, which fosters economic growth. In addition, SOEs take a high-road approach in their treatment of workers, which is favorable to maintaining the reproduction of labor power, improving workers' skills, promoting innovations in production processes, and increasing consumption demand. This high-road approach should have a pro-growth role if China moves toward a more sustainable growth model.

3.1. The boundary of SOEs

To investigate the pro-growth role of SOEs, we need to compare SOEs with non-SOEs, which requires a clearly defined boundary between the two. As mentioned above, SOEs refer to both state-owned enterprises and state-holding corporations. State-holding corporations appeared only after the reform of the state-owned sector in the second half of the 1990s. Table 1 presents China's employment structure, in which SOE employment is in categories XII and XIII. Only non-corporate SOEs belong to XII; all other SOEs, which are the majority, belong to XIII. We do

Table 1. The Structure of Total Employment in 2015.

I. Total employment (100)	II. Rural employment (47.8)	IV. Agricultural employment, rural private enterprise employment, and rural self-employment (47.8)		
		V. Urban private enterprise employment (14.4)		
		VI. Urban self-employment and unidentified employment (14.8)		
	III. Urban employment (52.2)	VII. Urban unit employment (23.0)	VIII. Collectively owned unit employment (0.6)	
			IX. State-owned unit employment (8.0)	XI. Government and government-funded institutions employment (unavailable)
				XII. State-owned enterprise employment (unavailable)
			X. Other unit employment (14.3)	XIII. State-holding enterprise employment (unavailable)
				XIV. Other employment (unavailable)

Sources: NBS (2017).
Notes: Numbers in parenthesis are the proportion of each sector in total employment.

not include category IX (state-owned unit employment) because a large part of IX is not enterprise employment.

Unfortunately, most of the available data on major economic variables such as wages and investments are for state-owned units rather than SOEs, and the data on state-holding corporations only exist for the above-scale industrial enterprise sector (ASIE). Therefore, we need to scrutinize whether a measure is actually reflecting the characteristics of SOEs and remind the reader when a measure might be biased.

With the boundary of SOEs defined, we compare SOEs to non-SOEs or to private enterprises. Non-SOEs is a larger category than private enterprises. Besides private enterprises, non-SOEs include foreign-funded enterprises, collectively owned enterprises,[5] and share-holding corporations that are not state-holding ones. However, when data for non-SOEs are unavailable, we use the data for private enterprises.

[5]Collectively owned enterprises are, like SOEs, public firms. However, these enterprises have become a very small sector since the 1990s, and excluding them does not affect our results.

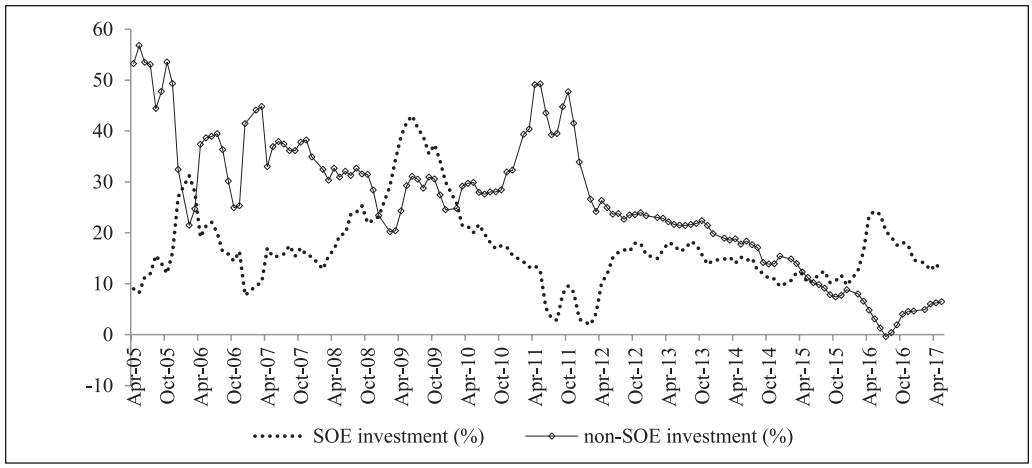

Figure 1. Annual Nominal Growth of SOE Investment Versus Non-SOE Investment, 2004–17.
Sources: NBS (2018).
Notes: The annual nominal growth of investment is the growth of monthly investment relative to investment of the same month in the last year. The figure presents the three-month moving averages of the annual nominal growth rates.

3.2. An economic stabilizer

SOEs' investment has been more stable than private investment in China. This has played a crucial role in maintaining aggregate demand, preventing recessions, and reducing uncertainty for all investors. Since 2004, China has released data on monthly investments completed by all enterprises and SOEs, which can be used to show the reaction of SOEs when total investment slows down. As Figure 1 shows, SOE investment grew particularly fast over 2008–09 and 2015–16 when the growth of non-SOE investment slowed down.

The role of economic stabilizer results from the central government's control over SOEs' investment decisions. The State-owned Assets Supervision and Administration Commission (SASAC) is the dominant shareholder in the 106 largest SOEs, also known as central enterprises, among which forty-seven enterprises have made the 2015 Fortune Global 500 list (SASAC 2015). The Central Committee of the Chinese Communist Party appoints the president of the board and party secretary of the fifty-one most important central enterprises. With these institutions, the central government can command SOEs to carry out massive investments when necessary. While SOEs have some say in their own investment decisions, those decisions are institutionalized in the context of a stable relationship between the government and SOEs. On the one hand, the central government needs SOEs to meet macro targets; on the other, SOEs, especially the largest ones, need policy and financial support from central government as well as stable macro conditions. This government-enterprise interdependence motivates SOEs to fulfill the central government's commands. Moreover, SOEs' investments benefit from the stable relationship between SOEs and financial institutions. In economic downturns, banks tend to maintain or even increase funds for SOEs.

Theoretically, the stabilizing role has both short-term and long-term effects on economic growth. In the short run, SOEs' investments can reduce the severity of an economic downturn. Since an economic downturn may have a permanent effect on long-term growth, SOEs can also contribute to long-term growth by offsetting the adverse effect of economic downturns in the short run. Thus, the stabilizing role of SOEs can effectively release a "hysteresis" effect—which

Table 2. Technical Progress of SOEs and Non-SOEs.

		1995	2004	2008
R&D/output (%)	SOE	0.33	0.77	0.90
	Non-SOE	0.22	0.43	0.49
Output of new products†/output (%)	SOE	7	15	16
	Non-SOE	15	10	10
Patents††/1,000 employees	SOE	N.A.	0.47	1.14
	Non-SOE	N.A.	0.45	0.85

Sources: Data are from NBS (1997; 2006; 2010a). Although the 1995 census reports only state-owned enterprises but not state-holding corporations, it is comparable to the 2004 and 2008 censuses because there were very few state-holding corporations in 1995. The most recent economic census was conducted in 2013; however, the 2013 census does not provide the data on the technical progress of state-holding enterprises.
Notes: † According to NBS (2010a), "new products" refer to the products produced with new technical principles and new designs, or the products that improve the initial ones in terms of structures, materials, or production processes so as to enhance products' performance or extend products' functions. †† In China, there are three types of patents: invention patents, utility model patents, and design patents. Here we are referring to invention patents because invention patents reflect more significant innovations than the other types.

was found in the US economy after the 2008–9 recession (Summers 2014).[6] The long-term effect of SOEs also depends on the efficiency and profitability of SOE investments. SOE investments may induce overcapacity in the long run, imposing an extra burden on long-term growth, especially when the central government has loose control over the areas of SOE investments and SOEs carry out those investments in an anarchic way. Given the conflicting possible effects of SOEs on long-term economic growth, this calls for empirical testing.

The role of SOEs as an economic stabilizer implies that there might be simultaneous causality between the share of SOEs in the economy and economic growth. We hypothesize that a higher share of SOEs leads to faster growth, but it is also expected that slower growth leads to a higher share of SOEs. A positive effect of SOEs on growth might be hidden by the second relation by which faster growth leads to a smaller share of SOEs. This must be taken into account in the empirical analysis to avoid simultaneous causality.

3.3. Promoting technical progress

To measure the growth of SOEs' technical progress, we calculate research and development (R&D) expenditure as a proportion of output, the industrial output brought by new products, and the number of patents per 1,000 employees, as shown in Table 2. We make use of China's industrial census or economic census conducted in 1995, 2004, and 2008 because it provides data on both state-owned industrial enterprises and state-holding industrial corporations, consistent with our definition of industrial SOEs. It is worth noting that we have not yet considered the quality difference in new products or patents between SOEs and non-SOEs. Table 2 shows that the technical progress performance of SOEs was superior to that of non-SOEs by all three measures in every year, except for output of new products in 1995. The relative advantage of SOEs increased over time through 2008. Li and Xia (2008) observed similar facts. In addition, Hsieh and Song

[6]Hysteresis means that, since a recession retards the increase in and updating of the capital stock and allows labor skills to degrade, the short-term effect of a recession is permanent. The Congressional Budget Office reduced the projected full-capacity GDP growth path of the US economy several times after the Great Recession as a result of the long-term effects of the Great Recession.

(2015) found that the total factor productivity growth of SOEs was faster than that of private enterprises from 1998 to 2007.[7]

One could question the role of SOEs in promoting technical progress by taking account of the opportunity cost of R&D activities. In other words, if the efficiency of R&D activities in SOEs was lower than that of non-SOEs, the same performance in technical progress could be achieved more efficiently in non-SOEs. If that were the case, there might be more technical progress associated with fewer SOEs. Along this line, in an influential study, Wei, Xie, and Zhang (2017) argue that SOEs' performance in innovation is lackluster compared to private enterprises because they find the number of patents for every 10 million yuan of firm-level investment in R&D is much higher in non-SOEs than in SOEs. The authors use a measure of the efficiency of R&D activities based on patent achievement.[8] However, technologies are highly heterogeneous. A simple comparison of the number of patents omits the quality difference in the patents of SOEs and those of non-SOEs. Major technical innovations require massive investments but do not necessarily bring significantly more patents, which would reduce the measured "efficiency" of R&D activities by that method. Therefore, the evidence raised by Wei, Xie, and Zhang (2017) does not demonstrate that SOEs are less efficient in innovation; on the contrary, it might be the case that SOEs concentrate their R&D on major innovations.

The State Science and Technology Progress Award provides a way to compare the performance of different types of enterprises in technical progress, given that only major innovations can compete for this award. This award is one of the five most important state prizes for science and technology; it is also the only one that can be given to organizations. Every year, the State Council gives this award to Chinese citizens or organizations that have made creative contributions in technological research, development, and innovations, popularized the application of advanced technologies, promoted the industrialization of new technologies, or accomplished major technological projects. This award is open to universities, research institutes, hospitals, and enterprises. The awarded projects represent the most influential technical advances in China, providing an opportunity to see how different enterprises have contributed to extending the technological frontier of the country.[9]

We use the latest data for comparison, for the year 2016 (MOST 2017). These data do not contain ownership information, and we use the National Enterprise Credit Information Publicity System, complemented by the China Stock Market and Accounting Research Database as well as open information from the websites of enterprises, to determine whether an enterprise is an SOE or a non-SOE. In 2016, there were 610 awarded organizations, among which 306 organizations are enterprises; of those enterprises, 60.5 percent were SOEs. This result suggests that SOEs have played a crucial role in promoting major innovations.

Most of these awards go to a group project involving several organizations, with one of the organizations listed as the "first" one or leader. Of the 132 awarded projects in 2016, the first organization was an enterprise for thirty-six projects. Of those thirty-six project-leading enterprises, thirty-one were SOEs and only five non-SOEs. Thus, SOEs played the main role among enterprises leading major technical projects.

We define the first of the organizations working jointly for an awarded project as "the leader" and the rest of the organizations as "followers." It is interesting to see who are the leaders, given the type of followers. Table 3 gives this leader-follower relation. Given an SOE follower, the

[7]Hsieh and Song (2015) did not consider the discrepancy in working hours; however, this might have a lesser impact on the growth of total factor productivity.

[8]The same result can be calculated with the numbers in Table 2: in 2008, the number of patents for every 10 million yuan R&D investments in non-SOEs was 37 percent higher than that in SOEs.

[9]While these awards are open to private enterprises, it is possible that the State Council, which grants these awards, has a bias in favor of SOEs.

Table 3. Leaders and Followers.

	Leader			
Follower	SOEs	Non-SOEs	Non-enterprise organizations (universities, research institutes, or hospitals)	Sum
SOEs	70	2	49	185
Non-SOEs	21	2	98	121

Sources: The list of award winners is from MOST (2017). The ownership of enterprises is determined based on information from the National Enterprise Credit Information Publicity System and the China Stock Market and Accounting Research Database.

leader is most likely also an SOE but very unlikely a non-SOE. On the other hand, given a non-SOE follower, the leader is most likely a non-enterprise organization but again very unlikely a non-SOE. Table 3 shows that twenty-one non-SOE followers worked with SOE leaders, while only two SOE followers worked with non-SOE leaders.

The State Science and Technology Progress Award is classified into three grades: the grand prize, the first prize, and the second prize. Projects receiving the grand prize or the first prize are of monumental significance in certain areas, such as the Beijing-Shanghai High-Speed Railway project, the ultra deep-water semi-submersible drilling platform, and two-line hybrid rice. It is noteworthy that these projects were not only of scientific importance but also of economic importance—they aimed at reducing transportation costs, ensuring energy supply, or enhancing productivity, all of which may contribute to economic growth. From 2002 to 2016, SOEs as leaders contributed 63.6 percent of grand prizes and 44.6 percent of first prizes, while non-SOEs as leaders only contributed 3.8 percent of first prizes and no grand prize. This shows the importance of SOEs in conducting major innovations that may generate substantial positive externalities across sectors. Despite this dominant role in major innovations, the R&D expenditure of industrial SOEs accounts for only about 40 percent of all R&D expenditure in the above-scale industrial sector.[10] This suggests that SOEs are relatively efficient in use of funds to pursue major technical innovations.

One can still argue that, hypothetically, if non-SOEs spent the same amount of money in R&D activities aimed at major innovations, they might achieve better performance than what we observe in SOEs. However, private enterprises are reluctant to invest in major innovations, which are usually highly risky investments. Major innovations help enhance national competitiveness and bring benefits to the country as a whole. Facing intensified competition, private enterprises tend to focus on marginal innovations to lower their costs or diversify their products. However, major innovations require an enterprise to have a less intensified competitive environment, a long view for its investment decisions, and stable relations with other stakeholders such as shareholders, employees, and financiers. SOEs are more likely to meet these requirements than private enterprises.

Finally, the high-road wage strategy of SOEs can have a positive effect on innovation performance. The relatively high wages of SOE employees puts pressure on SOEs to enhance technology in order to survive in market competition against low-wage non-SOEs.

[10]We estimate the SOE share in R&D expenditure with the data of the 2008 economic census, which might be slightly different in 2016.