3.4. A high-road approach in treating employees

SOEs take a high-road approach in the treatment of employees. As we mentioned above, the working week is shorter in SOEs than in private enterprises. Moreover, SOEs pay a significantly higher wage than private enterprises: in 2015, the average wage was 65 percent higher in SOEs than in private enterprises (NBS 2017).[11] Even if education and gender are controlled, employees of SOEs still enjoy a significant wage premium (Ge and Yang 2014).[12] Taking the average disposable income per employee of urban households as a living wage standard, in 2015, the average wage in SOEs is 10 percent higher than the standard; whereas that in private enterprises is one-third lower than the standard (NBS 2017). By not paying a living wage, private enterprises are indirectly subsidized.[13] Li et al. (2013) and Li and Qi (2014) showed that the profits of private enterprises would become negative if they were required to pay wages according to China's Labor Law. Besides, most SOE employees have access to social security, while only a few private enterprise employees have access to it. According to the National Bureau of Statistics, the share of migrant workers who participated in pension insurance and medical insurance was only 16.7 percent and 17.6 percent, respectively, in 2014; most migrant workers are hired by private enterprises (NBS 2015). If private enterprises paid the same wages and benefits and had the same working hours as SOEs, they would not be as profitable and efficient as they now appear to be.[14]

Paying high wages to workers is not necessarily favorable to economic growth. As we see in Section 4, the econometric results show that the Chinese economy over the two decades from 1993 to 2012 exhibits a profit-led growth model, which means that a higher wage share in GDP induces slower economic growth. Nevertheless, SOEs' high-road approach may promote economic growth both within the current growth model and in the transition to a more sustainable one.

First, paying higher wages does not necessarily correspond to a higher wage share in GDP, since the wage share in GDP depends not only on wages but also on labor productivity. The high-road approach to treating employees can promote the growth of labor productivity which, if it rises faster than the rate of wage increase, would increase the profit share rather than lowering it. Higher wages and better benefits enhance employees' loyalty and morale; they are also good for improving working skills and stimulating innovation. A high-road approach can create mutual trust and relatively harmonious management-employee relations. Comparative studies on the labor process have suggested that the mutual trust management-employee relation is a crucial factor underpinning the success of Japan's auto manufacturing firms in relation to their US competitors (Helper and Henderson 2014).

Second, SOEs' high-road approach in treating workers may have a forward-looking role in economic growth. This role is important because some crucial aspects of the current economic model are unsustainable. Sustainable economic growth requires sustainable reproduction of labor power, which in turn requires employers to pay a living wage. Failing to pay a living wage, which is widespread in private enterprises, will sooner or later generate social and economic

[11]We use the average wage of state-owned units because the official statistics do not report the average wage of SOEs.

[12]The higher wage is associated with the higher capital intensity in SOEs. Technologies in SOEs are more advanced so that labor productivity in SOEs is higher; thus, SOEs are capable of paying higher wages. However, there are also historical and institutional factors that ensure workers can benefit from the higher labor productivity through higher wages.

[13]Private enterprises that fail to pay a living wage are subsidized by their employees, employee family members, and/or the state.

[14]While the aggregate data indicate better wages and working conditions at SOEs, they do not always take a high-road approach to employees. Recently there has been increasing use of contract employees by SOEs.

obstacles to economic growth. Low wages and the overtime work that low wages induced have squeezed time for labor reproduction and sacrificed workers' health. Poor working conditions and meaningless long working time have intensified capital-labor conflicts and undermined social stability.

Another aspect of unsustainability is the overreliance on investment and exports (Zhu and Kotz 2010). With low wages, the consumption demand of the economy has been insufficient, making the economy vulnerable to overinvestment, trade conflicts, and external shocks from the global economy. Thus, moving to a more sustainable growth model requires steadily increasing wages and consumption in aggregate demand and moving away from reliance on investments and exports. It is easier for SOEs to accept higher wages given their high-road approach to treating workers. Thus, SOEs can be the bridge that connects the old and a more sustainable new economic model.

In conclusion, there are a number of reasons to expect SOEs to contribute to economic growth, although the effect might not appear in the short run. Regarding the role of an economic stabilizer, given the mutual causality between SOEs and economic growth, one might observe that more SOEs seem to be associated with lower economic growth. That is one reason for the conflicting views about the impact of SOEs on economic growth, although ideological bias is another reason for the belief that SOEs "must" be harmful for economic growth. Regarding the role of promoting technical progress, it usually takes time for an innovation to be economically profitable and to spread across the economy, which also makes the positive effect of SOEs likely to emerge only in the long run. Possible benefits of the high-road approach for technical progress would be realized in the long run. The forward-looking role in transition to a sustainable economic model would be visible only after the transition happens. In sum, the hypothesis we can test in the following econometric analysis is whether SOEs offset economic downturns and promote long-run economic growth.

4. An Empirical Analysis

4.1. The empirical model

In this section, we estimate the growth effect of SOEs, based on a panel dataset covering twenty-nine regions (province, autonomous region, or municipality; Chongqing and Tibet are excluded, due to data availability) and twenty years (1993–2012). To overcome the impact of economic cycles on the measure of SOEs (as discussed above), we take five-year averages of all the variables. Thus, the averaged panel dataset covers twenty-nine regions and four non-overlapping periods (1993–97, 1998–2002, 2003–07, and 2008–12). We establish the following empirical model:

$$GROWTH_{it} = \beta_0 + \beta_1 LS_{it} + \beta_2 SOE_{i,t-1} + \beta_3 SOE_{i,t} + \beta_4 SLOW_{it} + \beta_5 SOE_{it} \times SLOW_{it} + \sum_j \beta_j X_{jit} + \gamma_i + \delta_t + \varepsilon_{it} \quad (1)$$

In Equation (1), subscripts i and t stand for region and period, respectively; γ_i and δ_t stand for unit- and year-fixed effects, respectively; ε_{it} is the error term. GROWTH is the growth rate of real GDP, and LS is the share of labor income in national income. These two variables establish the basic framework of a heterodox growth and distribution model. In heterodox growth and distribution models (Kaleckian models, in particular), economic growth can be expressed as a function of the wage share or profit share (Naastepad and Storm 2006; Stockhammer, Onaran, and Ederer 2008; Hein and Vogel 2007). The sign of β_1 shows the type of growth regime: if $\beta_1 > 0$, it is a wage-led growth regime; if $\beta_1 < 0$, it is a profit-led regime.

Next, we add SOE variables to the basic growth-distribution framework. The SOE variables measure the share of state-owned enterprises in the economy. How to measure SOE is discussed in the next section. We add a one-period (i.e., five-year) lag of SOE to capture the effects of major technical innovations, which means it takes on average five years for those innovations to be effective economically. These effects cannot be realized immediately in that whole process of application, cost reduction, and market formation, and the spread of technology may take years to realize; thus, the economic effect of technical progress tends to be associated with the activities of SOEs that took place a few years ago. If $\beta_2 > 0$, that supports the claim that SOEs promote economic growth in the long run. To capture the stabilizer effect of SOEs in economic downturns, we add an interaction term between the contemporaneous SOE variable and a dummy variable, SLOW, which is defined as 1 if the growth rate of fixed investments (in real terms) of a region in a year is below the average of all the regions in the reform era, and 0 otherwise. The growth rate of fixed investments is used as a benchmark because SOEs can respond to low private investments by investing more. The coefficient of the interaction term, β_5, reflects how much the adverse impact of an economic slowdown can be offset by SOEs. With the interaction term, the contemporaneous effect of SOE becomes β_3, when SLOW = 0, and $\beta_3 + \beta_5$, when SLOW = 1.

In addition to the SOE variables, we also include control variables that often appear in the empirical studies on China's economic growth: PRI and SEC capture the sectoral structure; OPEN captures trade openness; FDI captures inward foreign direct investments; GOV captures the size of governments. Table 4 gives variable definitions and data sources. Table 5 gives descriptive statistics.

4.2. Measuring SOE

The variable of interest in Equation (1) is the share of SOEs in the economy. Current studies use a variety of definitions of the SOE variable. For example, Lin and Liu (2000) measure the share of private enterprises with private enterprises' share in total industrial output. Phillips and Shen (2005) adopt five measures: SOEs' share in total employment, in total industrial output, in the construction sector, in retail sales, and in fixed investments.

Among all the possible measures, we first exclude SOEs' share in the construction sector or in retail sales because these measures only reflect the share of SOEs in some minor sectors. Second, SOEs' share in the number of *zhigong* (formal employees) may overestimate the share of SOEs because the share of *zhigong* in urban employment declined substantially from 81 percent in 1993 to 38 percent in 2008, as a result of the reforms in the urban formal sector (NBS 2010c). Third, SOEs' share in total employment is not an appropriate measure. This measure is in practice calculated by dividing the employment of state-owned units by total employment, and the employment of state-owned units includes the employment of governments and non-profit institutions but excludes the employment of state-controlled shareholding corporations. The same problem exists in SOEs' share in fixed investment.

To measure the share of SOEs in the enterprise sector, we have to make a compromise to focus on the ASIE sector. The official statistics provide data on the SOEs in the ASIE sector. We adopt SOEs' share in the employment of the ASIE sector and SOEs' share in the output of the ASIE sector.[15]

[15]The ASIE data is available only after 1998. For the period 1993–97, we instead use the SOE share in the number of industrial *zhigong* and the SOE share in the industrial output of "enterprises with an independent accounting system." As mentioned above, the share of *zhigong* in urban employment declined substantially from 1993 to 2008. This decline happened mainly after 1998, when the SOE reform accelerated; thus the measure we use can still reflect the SOE share before 1998. Besides, Model (6) in Table 6 and Model (11) in Table 7 report the result for the period 2003–12—the data are all about the ASIEs—which can be seen as a robustness check.

Table 4. Variable Definitions and Data Sources.

Variable	Definition	Data sources
GROWTH	Real growth rate of regional GDP	NBS (2010b), CSY
LS	Compensation of employees / (GDP − depreciation of fixed capital)	CSY
SOE1	Employment of state-owned industrial enterprises and state-controlled industrial shareholding companies/employment of above-scale industrial enterprises	NBS (2010b), CSY
SOE2	Output of state-owned industrial enterprises and state-controlled industrial shareholding companies / output of above-scale industrial enterprises	NBS (2010b), CSY
PRI	Value added of the primary industry / GDP	NBS (2010b), CSY
SEC	Value added of the secondary industry / GDP	NBS (2010b), CSY
OPEN	(Export + import) / GDP	NBS (2010b), CSY
FDI	Inward foreign direct investments / GDP	WIND database
GOV	Government consumption / GDP	NBS (2010b), CSY

Notes: CSY refers to various issues of *China Statistical Yearbooks*. NBS (2010b) only covers the period 1949–2008, so we collect the rest of data from CSY.

Table 5. Descriptive Statistics.

Variable	N	Mean	Std. dev.
GROWTH	116	0.110	0.019
LS	116	0.575	0.077
SOE1	116	0.524	0.226
SOE2	116	0.526	0.207
PRI	116	0.161	0.082
SEC	116	0.451	0.077
OPEN	116	0.314	0.400
FDI	116	0.035	0.035
GOV	116	0.144	0.038

4.3. Methodology and results

We use a fixed-effect model to estimate Equation (1). Recently it has become popular to apply GMM to China's regional panel data; however, GMM is designed for "large N and small T" panels, but our panel has a small N. Meanwhile, given that we have a short panel (T = 4), we cannot explore the time series dimension of the panel, and a panel unit-root test is meaningless. Although it is simple, the fixed-effect model can improve the consistency of estimation by purging the unobserved unit effects. We also add period dummies to all the specifications. Given that China's reform was a gradual process that took place in different regions with different speed, it is likely that the explanatory variables are correlated with periods. The Hausman test also suggests that period dummies should be added.

We do not deal with the possible endogeneity of key variables using instruments. It is difficult to find suitable external instruments for a growth model, since many factors can have a direct impact on economic growth. Nevertheless, our treatment of the original data by taking five-year averages has already dealt with the simultaneous causality between GROWTH and contemporaneous SOE caused by the counter-cyclical fluctuation of SOE. Also, the lag of SOE

Table 6. Estimation Results with SOE1.

	(1)	(2)	(3)	(4)	(5)	(6)
LS	−0.104***	−0.085***	−0.089***	−0.079***	–0.059**	−0.146**
	(−3.078)	(−2.917)	(−4.177)	(−3.816)	(−2.539)	(−2.358)
L.SOE1		0.085***	0.071***	0.074***	0.065**	0.143*
		(5.337)	(3.234)	(3.267)	(2.080)	(1.957)
SOE1			−0.010	−0.012	−0.002	−0.122
			(−0.608)	(−0.560)	(−0.105)	(−1.573)
SLOW			−0.012***	−0.027***	−0.025***	−0.042***
			(−4.701)	(−5.446)	(−4.613)	(−3.378)
SOE1 × SLOW				0.027***	0.022**	0.066**
				(2.821)	(2.372)	(2.213)
PRI					−0.062	−0.013
					(−0.693)	(−0.077)
SEC					0.032	−0.085
					(0.647)	(−0.966)
OPEN					0.004	0.032
					(0.221)	(1.351)
FDI					0.035	0.150
					(0.325)	(0.562)
GOV					0.016	−0.222*
					(0.371)	(−1.848)
Adjusted R^2	0.512	0.611	0.664	0.677	0.674	0.621
N	116	116	116	116	116	58
Period	1993–2012	1993–2012	1993–2012	1993–2012	1993–2012	2003–12

Notes: The dependent variable is the real growth rate of regional GDP. t statistics are reported in parentheses. *, **, and *** represents $p < .1$, $p < .05$, and $p < .01$, respectively. All standard errors are heteroskedasticity-robust. All specifications include a constant and year dummies.

is exogenous to GROWTH. To avoid omitted variables, in addition to the regional fixed effect, we controlled time dummies and variables capturing the major factors of economic growth. Therefore, although the estimation is imperfect in terms of endogeneity, we believe that the results provide some evidence regarding the question we are addressing.

Table 6 gives the estimation results with SOE1 as the measure. Model (1) is a simple relation between growth and distribution. The coefficient of LS is negative and statistically significant, showing that the growth regime is profit-led, which echoes the results of Molero-Simarro (2015). Across all specifications in Table 6, the coefficients of LS are all negative; in particular, the absolute value of the coefficient is greater in Model (6), which means that the growth regime became more profit-led from 2003 to 2012. Model (2) adds the lagged SOE variable, which has a positive and statistically significant effect. This positive effect remains in all specifications. Model (3) adds the contemporaneous SOE variable and SLOW. Model (4) further adds the interaction term. The coefficient of contemporaneous SOE is negative, but statistically insignificant in both Model (3) and (4). The coefficient of the interaction term in Model (4) is positive and statistically significant, meaning that SOEs offset some adverse effects from economic downturns. The result of Model (4) implies that SOEs promote growth in the long run and in economic downturns, although SOEs have no significant contemporaneous effect on growth in normal times. This result remains in Model (5), when control variables are added. These control variables have no statistically significant effect on growth. Model (6) focuses on the period from 2003 to 2012. The result of Model (6) shows that both the long-run effect and the offsetting effect in economic downturns of SOEs become larger. Among the control variables, GOV has a negative and statistically significant effect on growth, which might indicate that productive functions of former

Table 7. Estimation Results with SOE2.

	(7)	(8)	(9)	(10)	(11)
LS	−1.106***	−0.098**	−0.092***	−0.073***	−0.173***
	(−3.109)	(−4.499)	(−4.515)	(−3.030)	(−4.021)
L.SOE2	0.060***	0.059***	0.062***	0.038	0.220***
	(3.227)	(2.781)	(3.167)	(1.592)	(5.634)
SOE2		−0.032	−0.035	−0.019	−0.013
		(−1.103)	(−1.286)	(−0.646)	(−0.450)
SLOW		−0.013***	−0.028***	−0.024***	−0.068***
		(−4.884)	(−3.824)	(−3.497)	(−4.707)
SOE2 × SLOW				0.018*	0.115***
				(1.727)	(4.188)
PRI				−0.018	−0.426***
				(−0.179)	(−3.530)
SEC				0.050	−0.107*
				(1.034)	(−1.871)
OPEN				−0.007	0.056***
				(−0.466)	(3.855)
FDI				0.082	0.086
				(0.742)	(0.448)
GOV				0.052	−0.343***
				(1.055)	(−3.439)
Adjusted R^2	0.550	0.646	0.655	0.656	0.796
N	116	116	116	116	58
Period	1993–2012	1993–2012	1993–2012	1993–2012	2003–12

Notes: The dependent variable is the real growth rate of regional GDP. t statistics are reported in parentheses. *, **, and *** represents $p < .1$, $p < .05$, and $p < .01$, respectively. All standard errors are heteroskedasticity-robust. All specifications include a constant and year dummies.

government agencies were transferred to enterprises after the SOE reform in the second half of the 1990s and early 2000s; other variables are still insignificant.

Table 7 gives the results with SOE2 as the measure. Models (7)–(11) corresponds to Models (2)–(6) in Table 6, respectively. As in Table 6, the results of LS show that the growth regime is profit-led. The coefficient of contemporaneous SOE is statistically insignificant in all specifications. The long-run effect of SOEs is positive and statistically significant in Models (7), (8), (9), and (11) but statistically insignificant in Model (10) under common confidence levels (it is significant at $p = .15$). The coefficient of SOE2 × SLOW is positive and statistically significant in Models (9), (10), and (11). In Model (10), all control variables are statistically insignificant. In contrast, in Model (11) focusing on the period 2003–12, PRI and SEC have negative and statistically significant effects; OPEN has a positive and statistically significant effect; GOV has a negative and statistically significant effect. The difference between the results of control variables in Models (10) and (11) might indicate that growth after 2003 relied more on real estate (which is a big sector in the tertiary industry) and the global market.

Thus, the econometric analysis finds that SOEs have no significant contemporaneous effect on growth both in normal times and economic downturns. The contemporaneous effect of SOE in economic downturns, which is $\beta_3 + \beta_5$, is statistically insignificant in most of the specifications in Tables 6 and 7.[16] Meanwhile, the results support our claim that SOEs have a positive long-term effect on growth and that SOEs can offset the adverse effect of economic downturns.

[16]It is statistically significant and positive only in Model (11).

Finally, we conduct a series of robustness checks. First, we replace SOE1 and SOE2 with SOEs' share in the value added of the ASIE sector and SOEs' share in total industrial value added. Second, we adopt the SOE share in a larger sector, i.e., the sector that combines the above-scale industrial sector and the construction sector. Third, we use yearly data instead of five-year averages. In that case, we conduct unit root tests and find that the variables in the panel are either I(0) or I(1) variables, so we apply the pooled mean group method to the data. In general, the key result remains in the robustness checks.[17]

4.4. Policy implications: Short-termism vs. long-run growth

As noted above, it is likely that for some regions SOEs appear to have a negative correlation with contemporaneous growth, since SOEs tend to grow faster when the economy slows down. We found the coefficients of the contemporaneous effect in some specifications to be close statistical significance. Moreover, some more advanced regions (e.g., Zhejiang Province) have very few SOEs now, which might send a false signal to other regions that privatization can promote growth everywhere.

As a result, it might be tempting to state and local officials to privatize SOEs,[18] even if privatization harms growth in the long run and makes the economy more vulnerable to economic slowdowns brought by either external shocks or internal contradictions. However, given the intense competition between local officials for promotion, their behaviors are often characterized by short-termism. Local officials may seek to privatize local SOEs based on a belief that it will accelerate GDP growth or that "reforming" SOEs will polish their resume, leading to a promotion, while the official leaves the region before the negative effects of privatization are realized. Such opportunistic behavior may be promoted by the personal material benefits that officials can often gain from privatization.

This short-termism in privatization may also arise at the central state level. However, competition among officials is not a driving force for the state. There is more room for the state and the leadership to consider long-run goals and restrain local short-termism. The establishment of SASAC to oversee the largest SOEs in 2003 has allowed the state to enforce attention to long-run goals and to some extent insulate the largest SOEs from local short-termism.[19] Under this circumstance, the state's attitude toward privatization matters for the future of SOEs.

In recent years, particularly since the global financial crisis and China's massive stimulus package, China's economy entered the so-called "new normal" stage characterized by slower growth, a high debt/income ratio, overcapacity in some sectors, a housing bubble, and rising wages. Rising debt and overcapacity are serious problems for SOEs because they were encouraged to borrow heavily to finance big investments during the financial crisis. It is a critical time for the state to think about how to solve SOEs' problems and whether initiating another round of privatization would contribute to solving these problems. Our study suggests that privatization would be harmful to economic growth in the long run. In our view, privatization would destroy a central pillar for China to be able to achieve sound economic growth under unfavorable conditions.

[17]The robustness checks are available upon request.

[18]In China's context, the state refers to the central government.

[19]It is worthwhile to note that the state recently modified the role of the SASAC by cancelling or weakening the intervention that the SASAC could impose on SOEs (State Council of China 2017). This change may affect the state's capacity to make SOEs pursue long-term goals.

5. Conclusion

In this paper, we attempt to address the classic question in China's context: what is the impact of state ownership on economic growth? The earlier literature fails to consider that private enterprises treat their workers badly, violate China's labor laws, and provide workers with a wage lower than a living wage. Such practices undermine the contribution of private enterprises to economic growth in the long run. Most of the current studies ignore the role of SOEs in stabilizing economic growth and promoting technical progress. We argue that SOEs are playing a pro-growth role in several ways. SOEs stabilize growth in economic downturns by carrying out massive investments. SOEs promote major technical innovations by investing in riskier areas of technical progress. Also, SOEs adopt a high-road approach to treating workers, which will be favorable to the transition toward a more sustainable economic model. Our empirical analysis indicates that SOEs in China have promoted long-run growth and offset the adverse effect of economic downturns, while they have no statistically significant contemporaneous effect on growth.

Compared to a typical capitalist economy, China is distinguished by a large state-owned sector. Historically, the economic transition and institutional changes in China's reform era continuously shaped SOEs' roles in the economy. The changing roles reflect the dynamic contradictions of the economy. These enterprises shifted from the basic production and welfare-provision units to autonomous firms facing market competition while also serving as instruments of the state. SOEs' role in providing welfare was replaced by the role of stabilizing growth. One can expect that the role of SOEs will change further in the future. How the SOEs evolve will be crucial for resolving the contemporary contradictions of China's economy and for finding a path toward a sustainable economic model.

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