Behavioral Finance And Development Economics Association
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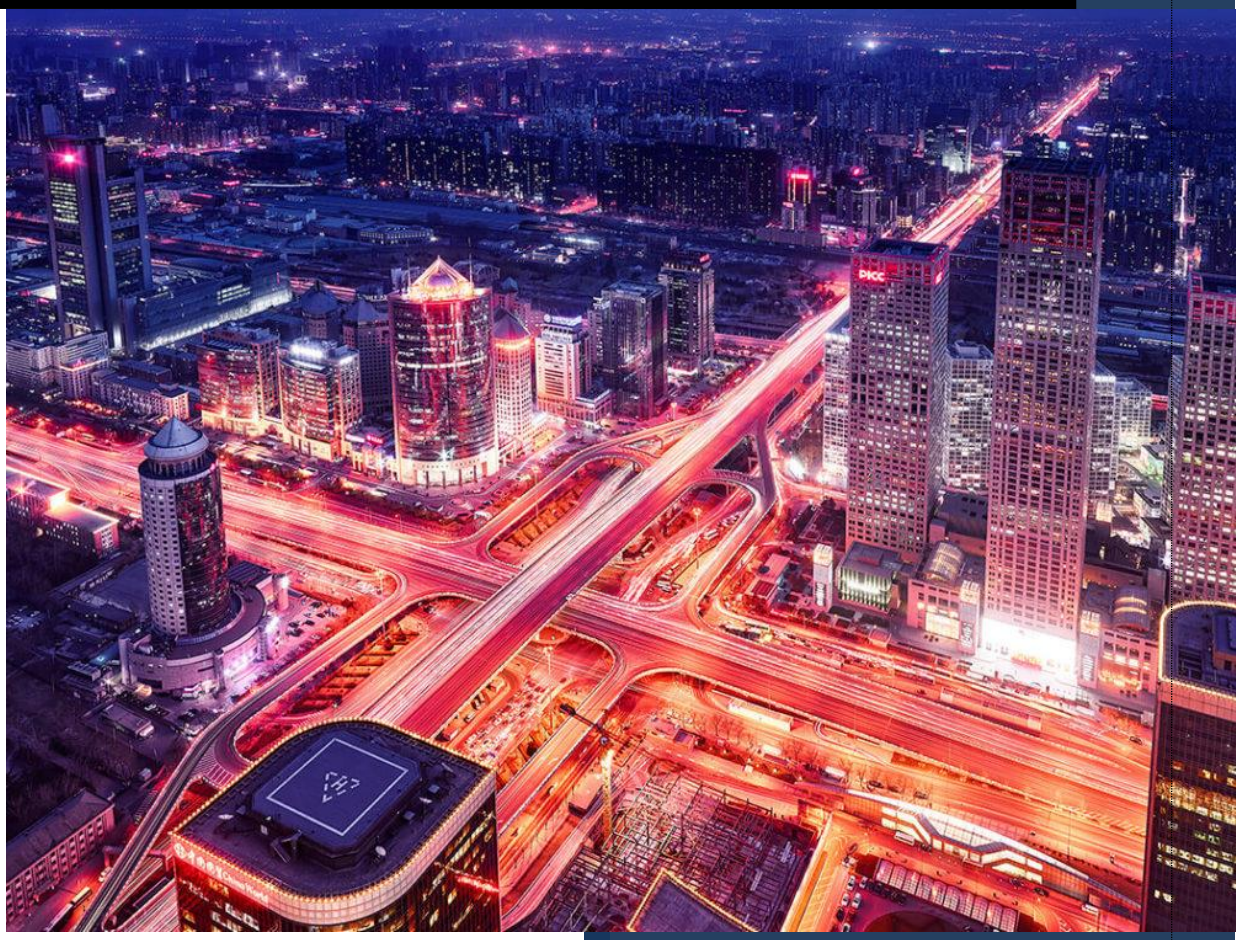
Resource Misallocation Among Listed Firms in China



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Abstract
China is the world's 2nd largest economy behind the USA by nominal GDP and since 2016, it has been the largest economy if measured by purchasing power parity (PPP). China's economy can be characterized as a socialist market economy, which incorporates industrial policies and strategic central planning. Even though the Chinese economy is one of the fastest growing ones, with a growth rate in the range of 2.2%-8.4% between 2020-2022 (Kurtenbach, 2023), resource misallocation poses a major threat to their economic position. This misallocation happens for a variety of reasons, most importantly due to economic planning, the prevalence of state-owned enterprises, credit misallocation, and constraints on factors of mobility. In this paper, we will deep-dive into these reasons and analyze the negative effects that resource misallocation has on the Chinese economy.

Five-Year Plans of China
Since 1953, The Five-Year Plans issued by CCP had a pioneer role in shaping and guiding the Chinese economic growth. In the earlier years, the plans were highly affected by Soviet methodologies (Chen et al. 2017) and China utilized the capital control it had to start an aggressive industrialization drive. The government increased its control by putting financial pressure and convincing private firm owners to sell their companies or turn them into joint public-private enterprises (Harrell & Stevan, 2023). The very first Five-Year Plans were a success for China, causing rapid growth in the economy, developing heavy industrialization, and increasing overall welfare (Hu, 2013).

Table 1: Proportion of Indicators in Each Five-Year Plan. The Impact of Five-Year Plans on economic development can be observed throughout the years.

	6th Five Year	7th Five Year	8th Five Year	9th Five Year	10th Five Year	11th Five Year	12th Five Year
Economic Growth	15.2	21.4	26.9	23.5	10	9.1	4.2
Economic Structure	45.5	35.7	30.8	23.3	23.3	13.6	8.3
Total Proportion of Economic Indicators	60.7	57.1	57.7	47	33.3	22.7	12.5
Education and Technology	15.2	7.1	3.8	11.8	23.3	9.1	16.7
Resources and Environment	3	3.6	7.7	11.8	20	27.2	33.3
People's livelihood	21.2	32.1	30.8	29.4	23.3	41	37.5
Total Proportion of Social Indicators	39.3	42.9	42.3	53	67.7	77.3	87.5

Source: Hu, 2013

In recent decades, China has restructured its Five-Year Plans, trying to create macroeconomic goals rather than making investments with growth targets (Chen et al., 2022). Hence the process of developing more market-friendly policies had begun (Hu, 2013). Since 1997, China has

adopted a policy of "grasping the large and letting go of the small", showing an afford of privatization (Chen et al. 2022).

Apart from all these breakthroughs, there is still an alarming productivity problem among SOEs in China. SOEs are being left behind by POEs in the same industry, in terms of indicators like ROI (Jurzyk and Ruane, 2021). The firms with low productivity show higher leverage, demonstrating that this problem might be the cause of resource misallocation (IMF, 2020).

Figure 1: Profitability and Financial Leverage Ratios

Sources: Wind and IMF calculations. The table acquired from IMF country report no. 23/33

Measuring Productivity Gap

To measure the efficiency of POEs and SOEs, the following Cobb-Douglas production function with constant returns to scale is used by Jurzyk and Ruane (2021), while the real value added (Y) is a function of labour (L), capital (K), and technical efficiency (A). For i firm in sector s:

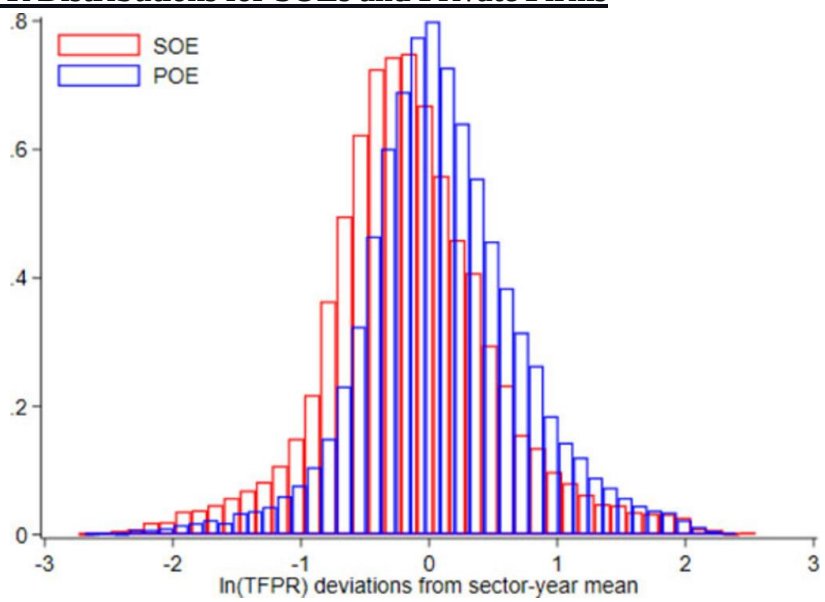
$$Y_{si} = A_{si} K_{si}^{\alpha_s} L_{si}^{1-\alpha_s}$$

Then, the total factor revenue productivity is measured with the following formula:

$$TFPR_{si} \equiv \frac{P_{si} Y_{si}}{K_{si}^{\alpha_s} L_{si}^{1-\alpha_s}} = P_{si} A_{si}$$

where P_{si} is the price index for firm i. The TFPR captures the technical efficiency and the product quality differences across firms, as well as the variation in firm-level prices. On average, it is observed that the SOEs have a 30% lower TFPR. In Figure 2, the distribution of the firms' TFPR values is exhibited, with POEs having a higher median value, and thus indicating a higher efficiency than SOEs.

Figure 2: TFPR Distributions for SOEs and Private Firms



Source: Jurzyk & Ruane, 2021

Resource Misallocation - Definition and Reasons

Resource misallocation refers to the scenario where capital and labour are poorly distributed, meaning that less productive firms receive a larger share of the capital and labour than what they should according to their productivity level (IMF, 2018) possibly lowering the total production of a firm. Some common factors can cause resource misallocation including constraints on factor mobility, taxes or trade policy, and government interventions that are causing an uneven marketplace (Chen et al. 2022). In China's case, the main factor that is causing the problem of misallocation can be found in the government's SOE-favoring policies. Misallocation can happen for a variety of reasons (Restuccia, Rogerson, 2017):

1. **Regulations**

   Governments can favour less productive enterprises and consequently allocate more resources to them overlooking their productivity. This can happen for example in the case of state-owned enterprises or when the company is providing a necessity for the citizens (e.g. monopolistic utility markets).

   In the case of China, regulation mostly comes in terms of economic planning which sets out a set of regulations and goals for industries that they need to follow. Furthermore, the government's power to intervene in the market activity as they see fit, especially in terms of prioritization of certain industries over others, creates an uneven marketplace and decreases productivity in the unfavoured industries.

2. **Property rights: State-owned enterprises (SOEs)**

   A state-owned enterprise (SOE) is a fully or partially government-owned business participating in economic activity while aiming to promote public interest (Bhatt, n.d.). However, SOEs are often less productive than private companies, therefore, a reliance on SOEs can lower the overall economic productivity of the country. The responsibility structure of SOEs is one of the primary reasons for their low productivity, as in a private

corporation, the leadership structure of the firm is straightforward and there is usually external oversight of the company to be as productive as possible, while in SOEs, this oversight mechanism largely falls on the government, how might have other incentives apart from productivity maximisation. This would not necessarily be bad, given that some SOEs are established in sectors where other incentives, such as social or environmental goals are important to be kept as a metric for firms' success, and as it might clash with the productivity and profit maximising incentive of the private sector, the government oversight of the SOEs ensures these goals are not neglected. However, the government's involvement does not come without its problems. In case of insufficient leadership, firms in the private sector have set mechanisms for their replacement, whereas in SOEs, especially in countries where corruption and favouritism is rampant, leadership might be appointed due to proximity to the ruling party as opposed to on a meritocratic basis.

3. **Trade and competition**

   SOEs also decrease competition in the market, given that due to the government's involvement, these companies are likely to be favoured by the government compared to firms in the private sector. This can take the form of grants, credits, and even regulatory barriers. Furthermore, trade can also affect resource misallocation. In a market with a prevalence of SOEs, governments are incentivised to favour their local firms as opposed to more productive and cheaper imported products.

Centralized Economy and Government Incentives

In China, the central government widely uses three main tools to support firms: tax deductions, subsidies, and credit benefits. It is a known theory that distortions related to tax and subsidy policies can decrease the aggregate productivity of a firm (Restuccia & Rogerson, 2008). Low TFPR firms receiving larger subsidies are supporting data of this theory in China's Case (Chen et al. 2022). Tax deductions applied to SOEs reduce their operational costs, and these firms are also much more likely to get subsidised by the government even though they are less productive than their private counterparts. This deprives POEs of crucial financial resources to further improve their operations and efficiency and rather concentrates the funding in the hands of the less productive SOEs.

Credit Misallocation

When the state has a firm's shares, the firm can benefit from lower interest rates than privately owned firms. This trend especially shows itself when formal financial institutions prioritize SOEs (Allen et al. 2005). The preference of the government over the profit of SOEs can be modeled with a utility function (Wei et al. 2016). The model demonstrates how the government prioritizes SOEs in some sectors, creating an uneven market that creates difficulties in accessing financing. This is also a problem for POEs, making them suffer higher financial costs and difficulties with credit funding from banks in China (Wei et al. 2016).

SOEs benefiting from lower interest rates might cause a tendency to keep more capital, which the firm is failing to put in efficiency and increase its profits. This situation might explain the high leverage rates and lower ROI values (Jurzyk & Ruane, 2021).

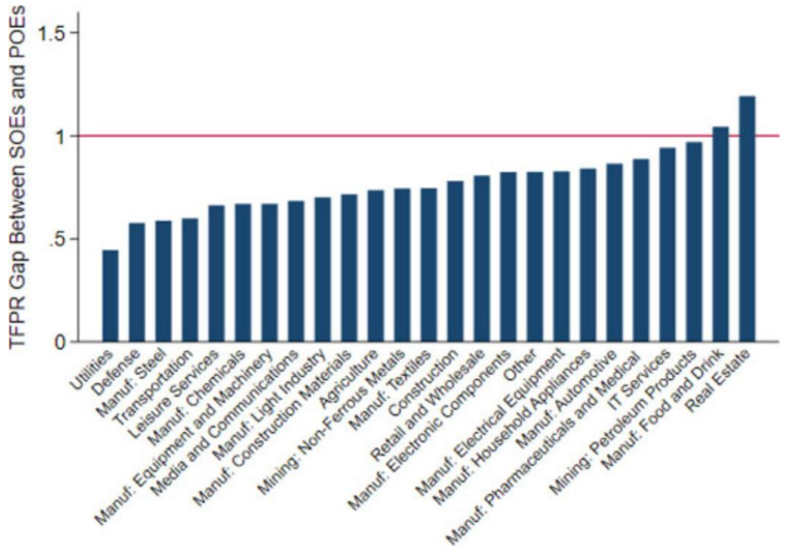
Constraints on Factor Mobility

Due to the heavy involvement of the government, SEOs have a rather bureaucratic structure, which makes them less effective and slower in responding to market changes and making swift decisions. Furthermore, there are increased chances of corruption because of the strong political ties, which means that the company is forced to do the most politically pleasing action instead of the most productive one. This also means that the leadership of such companies is less likely to be transparent and accountable, especially in countries with weak or non-democratic governments. It can also be observed that the SOEs are suffering from structural and governmental problems that are creating an inefficiency in factor mobility. Apart from the possible inefficiencies of centralized governing, financial frictions or employment restrictions can also cause an inefficient use of capital, resulting in misallocation.

Discussions on Other Possible Reasons for Capital Intensity

In practice, firms can have an excessive amount of capital accumulation even though the resources are not misallocated. Firstly, the company may be using more advanced technology and producing a higher quality product or decreasing the labor cost. However, no relevant data is showing that the SOEs in China are using more advanced technology. Furthermore, the labor productivity of the SOEs is 6 percent lower than that of POEs, indicating that the excessive capital investment is not a result of the technological preferences that prioritize lowering the labor cost. Secondly, the SOEs in China might be working in more capital-intensive industries. But even in an intra-industry comparison, the SOEs in China are left behind in capital efficiency. Thus making such an evaluation about the capital rates of SOEs does not seem possible with the acquired data.

Figure 3: SOE TFPR Gaps by Sector for 2016-2019



Source: Jurzyk & Ruane, 2021

The Negative Impact of the Misallocation on Chinese Economy

The misallocation of resources in manufacturing between private and state-owned enterprises in China is a key source of productivity loss. According to Brandt et al. (2013), a paper studying the importance of misallocation within the non-agricultural. “They find that misallocation

reduces non-agricultural total factor productivity by an average of 20% for the period 1985-2007. More than half of this productivity loss is due to within-province misallocation of capital between state and non-state sectors. While across-province distortions remain fairly constant over time and there is a reduction in the share of state-owned enterprises over time, the authors find increased state/non-state capital misallocation between 1998 and 2007. We are not aware of comparable studies for countries other than China." (Restuccia, Rogerson, 2017)

Reforms Against Misallocation

With the existing data and evidence, it is reasonable to claim that the main factor negatively impacting the efficiency rates of state-owned firms in China is the preferences of the government for SOEs over POEs, and the consequent reactions of the financial institutions resulting in a credit misallocation. The unequal distribution of the credits makes excessive capital accumulation possible for SOEs, increasing the rate of assets that do not contribute to the profit rates. Furthermore, the preferences of lending institutions make finding funds harder for privately owned firms and potentially cause an under-capitalized private sector. It can be suggested that the strategy that the government has to focus on for the following years is implementing regulations for more equal credit-acquiring procedures and costs of debt for POEs and SOEs, decreasing credit misallocation.

Another possible strategy can be reconstructing the organizations of SOEs that prevent the potential effects of diseconomies of scale and constraints of factor mobility. A rigorous evaluation of the enterprises' organizations and regulations to reduce the bureaucratic burden of SOE management may have a positive impact on efficiency. Further observations can be carried out to measure the effective use of labour and take consequential actions, if necessary.

Even though the Chinese government is making an effort to reconstruct the SOEs and has an incentive for privatization, it might be evaluated as a slow and cautious process. Furthermore, we should consider the difficulty of reconstructing large SOEs, which can be observed in the example of the complexities that the ex-socialist Eastern European countries suffered from the economic and social consequences while implementing such a transition policy. Finally, the central government being reluctant to let go of such a large scale of capital control is another possibility for the current cautious pace of transition.

Conclusion

While China experienced a major industrial leap in their history with the help of centralised economic planning, the efficiency problem of Chinese SOEs is becoming an obstacle to China's development. The excessive amount of capital accumulation which is causing resource misallocation seems to be the main reason for the lower levels of ROI and TFPR. The SOEs being favoured by the government and the consequent credit misallocation of the banks prove to be one of the main causes of the excessive capital accumulation, along with the potential inefficiencies of centralized governing. In this sense, China may need to review the credit allocation between the firms and reconstruct its centralized governed economy, which potentially might be the indicator of a more liberal marketplace.

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