

CHINA'S RAPID ECONOMIC GROWTH: EXAMINING EVIDENCE BASED MICRO LEVEL DATA

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Abstract: The exponential boom of the Chinese economy in the past decade and its potential for sturdy increase into the foreseeable future has precipitated anxieties within the rest of the world. Some commentators see Chinese boom fully in terms of opposition for exchange and funding possibilities with different growing economies and a prime cause of structural changes inside the superior industrialized economies. In particular there were warnings of intense consequences for global agricultural markets. In this paper we use Chinese listed corporations to measure the sustainability of China's rapid increase through the estimation of industry total component productivity. This paper assesses the productiveness of the China's corporate quarter to gauge the sustainability of financial boom in China. As shown in figure 1(1), the China's financial system grew hastily at higher than 10 percent annually on average from the Nineties to the worldwide financial crisis. even though the growth charge has declined to the unmarried digit level because the disaster, the chinese financial system is still main the sector economy, growing at a better fee than that of the arena economic system.¹ The growth prospect of the chinese financial system has giant implications for the worldwide financial system. Till recently, monetary boom in China have been driven with the aid of rapid developing TFP and capital accumulation.

This model captures now not simplest the composition of the direct exchange influences of traits in the China's economic system however additionally the results of the endogenous flows of financial capital on macroeconomic adjustment within the global financial system.

Keywords: Chinese economy, China's financial system, global agricultural markets, global financial system.

1. INTRODUCTION

This paper discusses the sustainability of China's rapid increase especially primarily based at the estimation of the company-level total component productivity of Chinese language listed corporations. For the reason that, both capital accumulation and rapid technological development -- measured as overall aspect productivity (TFP) -- have contributed to the high increase of the Chinese language mixture output ought to the prediction of the same old boom theory be accurate, however, monetary boom led via capital accumulation is not probable to be long lasting, therefore we particularly recognition on firm stage TFP growth. As a result, we become aware of 4 channels that would preserve to promote the TFP boom of the Chinese language company quarter at an combination level: (i) declining proportion of low-productiveness nation-owned establishments, (ii) continuous influx of especially in a position new begin-ups, (iii) large catching up trend some of the laggards inside the company distribution, and (iv) innovation spawning R&D sports. those 4 channels could underpin the medium-term monetary increase of the Chinese language financial system.

This paper assesses the productiveness of the Chinese language corporate quarter to gauge the sustainability of financial boom in China. As shown in figure 1(1), the chinese language financial system grew hastily at higher than 10 percent annually on average from the Nineties to the worldwide financial crisis. even though the growth charge has declined to the unmarried digit level because the disaster, the chinese language financial system is still main the sector economy, growing at a better fee than that of the arena economic system.¹ The growth prospect of the chinese financial system has giant implications for the worldwide financial system. Till recently, monetary boom in China have been driven with the

aid of rapid developing TFP and capital accumulation. Zhu (2012) and Liu (2015) argue that the common annual growth rate of the TFP in China from 1978, whilst the reform and commencing-up started, to the latest economic disaster become round three to four percent. In addition, as parent 1(2) shows, the Chinese language saving charge, which has been better than that of Japan and Korea even during their excessive-growth duration, has supported big-scale funding with the aid of the company sector. Besides, after the economic crisis, the Chinese authorities made formidable efforts to spur the financial system with the aid of deploying the so-called 4 trillion yuan stimulus package deal, that is, massive-scale growth-promoting infrastructure initiatives.

In the lengthy-run, we cannot expect ever-increasing contribution to financial increase from capital accumulation. Solow (1956) shows that financial increase led through capital accumulation cannot be sustained on a protracted-term foundation without non-stop increase in the saving price.² In reality, funding driven financial increase ended after the leveling-off of the saving price in both Japan and Korea, which had experienced excessive economic boom pushed specially by way of capital accumulation. Then, in China, high economic boom supported by means of speedy developing capital accumulation can't be sustained for a protracted duration. On this regard, reasons can be mentioned. First, the saving price in China is possibly to say no within the destiny in view that China is at the way to turning into an growing old society. 2d, as proven in determine 1(three), the actual growth rate of funding has been declining for the reason that round 2012, especially in the corporate sector, which has been suffering from but-to-divest extra capacity and debt overhang issues. Accordingly, the sustainability of the monetary boom in China depends on the trend of TFP increase.

This paper affords insights into the TFP growth in China to observe the sustainability of the USA's financial increase based totally on records and empirical analysis using data of indexed firms. One of the blessings of the use of micro records is that we are able to particularly examine channels that contribute to TFP increase through making use of the statistics approximately heterogeneity throughout firms, which we can't take a look at in aggregate statistics. Jumping to the realization, we found that the following 4 principal channels facilitate the TFP boom in China:

- (i) Declining percentage of low-productivity kingdom-owned enterprises
- (ii) non-stop influx of distinctly ready new begin-ups
- (iii) large catching up fashion most of the laggards in the company distribution
- (iv) Innovation spawning R&D activities

Assuming that those channels remain functioning, we can expect that the TFP boom will continue to develop, to be able to promote sustainable boom in China.

The rest of the paper is prepared as follows. Chapter 2 calculates TFP measures using information on indexed firms and describes the traits of the distribution. Bankruptcy three assesses the composition results, where excessive TFP companies update low TFP ones, on the mixture TFP stage. Chapter four presents records on the channels for the TFP boom of individual firms. Chapter 5 units forth our conclusion.

2. COMPANY STAGE TFP AND THE DISTRIBUTION

First of all, we construct an index of TFP for person companies. Given that we cannot have a look at TFP levels immediately, in another way from capital or hard work inputs, we assume a Cobb-Douglas manufacturing characteristic for individual firms and calculate TFP as Solow residual, following existing literature. We count on that a company inputs both capital and labor to supply fee brought, as follows

On the grounds that all of the variables at the right hand facet of the equation, inclusive of the labor cost percentage, are observable, we use the equation and calculate firm level TFP. We appoint annual panel facts from 2010 to 2016 of four,452 Chinese language corporations listed on the Shanghai, Shenzhen, Hong Kong, and U.S. stock exchanges.

We construct every variable on the right hand aspect of the equation as follows. We calculate the cost delivered because the sum of running earnings, hard work cost, and depreciation, and then deflate the use of the GDP deflator for each enterprise. The whole price added of three,518 corporations in 2016, whose cost introduced we will calculate via this system, quantities to 7.6 trillion yuan, which corresponds to 1-10th of the Chinese actual GDP in 2016. We employ the exquisite amount of actual fixed assets as capital enter whilst we use the variety of personnel as hard work input. We rent the economic common of the share of hard work price, which we calculate from the share of labor price in fee added for character corporations, as the labor value share.

Subsequently, we note the characteristics of the distribution of the TFP degree for person companies calculated as above. Determine 2(1) suggests a histogram of the TFP level. Because the distribution is biased in the direction of the proper with a skewness of three. seventy nine, the difference between the TFP level of a general company and that of a high TFP stage firm is massive. to peer this point numerically, we outline "frontier firms" as corporations with a TFP stage inside the top ten-percentile for each quarter, and we find that the median TFP stage of frontier companies is three because we do no longer don't forget neither the utilization of inputs nor scale economics in calculating TFP, our TFP can also encompass the effect of macroeconomic factors. Furthermore, we do not standardize the TFP of person companies by subtracting their area common as in Aw et al. (2001). that is due to the fact, as we display in bankruptcy 3, no longer simplest region precise elements but additionally ownership, firm age, and so forth will affect company degree TFP, and one in all our targets is to discover these factors clearly. Further, it's miles possible that our evaluation has so-called survival bias because we appoint statistics on indexed corporations. However, as an exceptionally small number of corporations have been delisted throughout the sample duration, the effect of the prejudice on our analysis might be very small.

In chapter four, we use because the TFP boom for every firm. We exclude firms with extremely high or low TFP increase, that is, people with TFP growth inside the pinnacle and backside one percentiles. Moreover, we exclude corporations who lack at least one of the information items to calculate TFP level as below.

Further to my approach to calculate value delivered (the additive technique), another method could be the usage of sales aside from income administrative prices (the subtractive method). The correlation among the pooled pattern of value introduced derived from the former method and that derived from the latter technique is 0.95. This paper employs the additive approach because we are able to have a bigger sample. in the meantime, given that region precise GDP deflators are not to be had in China, we alternatively calculate the increase with the aid of subtracting actual GDP growth from nominal GDP growth for each zone.

In calculating the average proportion of labor fee for each area, we exclude corporations with a proportion higher than one as outliers.

Instances better than that of the entire sample as shown in determine 2(2). It suggests that, supposing that the TFP stage of frontier corporations is constant on the cutting-edge level and that the TFP of a preferred firm with the entire sample's median TFP level grows at an annual rate of five percent, the gap is so large that it takes greater than two decades for the same old company to attain the frontier. as a consequence, due to the fact there's a big gap within the TFP degree between widespread chinese language companies and frontier corporations, potentially the mixture TFP can develop thru trendy companies' catching as much as the frontier.

3. TFP INCREASE THROUGH COMPOSITION IMPACT

This chapter indicates the characteristics of corporations with a excessive TFP stage and those with a low TFP level and examines how the compositional trade influences the aggregate TFP stage (Composition effect). In China, since the 2000s, inside the course of the transition from a planned economic system to a market economic system, the presence of SOEs, whose TFP degree generally seems to be low, has declined even as new non-public companies have started business one after every other, some of whom have global competitiveness. We consciousness at the impact of this kind of acceleration inside the firms' turnovers at the mixture TFP stage thru the composition impact and compare it using the company degree TFP facts, which we derived within the previous chapter.

3.1 Declining Presence of Low-productivity SOEs

Because the 2000s, a number of structural modifications have took place inside the chinese language economy, and one of the symbolic adjustments is the declining presence of SOEs. parent 3 indicates the asset share of SOEs within the industrial area. The proportion turned into higher than 50% in the early 2000s, however it has declined to simply over 10% recently.

Several research have talked about the inefficiency of SOEs in diverse elements. First, SOEs have a strong courting with the chinese government and play an vital function in attaining the government's objectives together with economic boom and employment stability. accordingly, if required via the authorities, they make investments and rent plenty without regard to business issues, and, as a result, their control has a tendency to be inefficient. 2d, to aid SOEs who play these

critical roles, the authorities and financial institutions offer them with a variety of preferential remedy. some research point out that the government supports SOEs by using the exemption of dividends, and that financial institutions offer them with a good financing environment due to the fact they've implicit government guarantees.⁹ because of such preferential treatment, the SOEs can live in the marketplace even if their profitability is so low that they should be required to exit. As a end result, the TFP stage of the SOEs is commonly considered to be low. desk 1(1) indicates the regression end result of the character TFP degree, which we derived inside the preceding chapter, on SOE dummy, which takes 1 if a company is a SOE and 0 in any other case, and says that the TFP level of SOEs is lower than that of personal corporations by 17 percentage factors on average.

It is often pointed out in literature that the lifestyles of low-TFP SOEs has worsened the economy-wide aid allocation in China.^{eleven} on this admire, the continuous decline inside the relative scale of SOEs has contributed to elevating the combination TFP degree via the composition effect. To be specific, based totally on the above estimation result, we can calculate that the decline in the share of SOEs, who've a decrease TFP degree than that of private firms via 17 percentage, from 72.7 percentage in 2001 to twelve.8 percent in 2017, has contributed to financial system-extensive TFP boom through 0.7 percent points yearly.¹²

3.2 Boom in high-productiveness New firms

At the same time as the presence of SOEs has declined, a number of private corporations have actively commenced enterprise in China, and the turnover has expanded. determine four shows the distribution of the firm age of listed companies in China, the U.S., and Japan. the share of firms more youthful than two decades old in China is better than that of the U.S. and Japan, and the share of firms younger than 10 years old is smaller than that of the U.S., however far larger than that of Japan.

Similarly, another feature of China is that there are many internationally competitive corporations among newly hooked up ones. table 2 shows the common firm age by u . s ./region of listed firms who ranked inside the international's top 1,000 for marketplace capitalization. In 2016, 91 Chinese companies ranked in the global's pinnacle 1,000, and their average firm age, 22 years vintage, is more youthful than that of some other USA. furthermore, the competitiveness of newly established chinese firms is likewise obvious of their TFP degree. desk 1(2) indicates the regression end result of the person TFP degree of our statistics on firm age, and it suggests that, if a firm is 10 years younger, it tends to have a 10 percentage better TFP degree. in addition, thinking about the fact that many newly mounted corporations are personal corporations, we show any other regression bring about table 1(3) via adding an SOE dummy in explanatory variables and get similar consequences.

Accordingly, I argue that the non-stop influx of excessive-TFP newly hooked up firms has contributed to the growth within the mixture TFP level through composition effect.

One of the reasons why the TFP stage of newly mounted companies is fairly high may be that the entry conditions for rising corporations are tightening due to the lifestyles of SOEs with a TFP degree that is so low they need to go out from the marketplace.¹³ normally, if access conditions tighten, the influx of begin-United states of America will lower even in those circumstances, the reality that high-TFP newly set up corporations are continuously entering the market is a large gain for the Chinese economy. this may occur because the Chinese authorities have actively engaged in incubation.

4. TFP INCREASE OF PERSON FIRMS

This chapter assesses elements that affect the TFP increase of incumbent organizations in China. existing literature has emphasized mainly channels: boom by catching up, where low TFP corporations get technology spillover through imitating excessive TFP companies, and increase by way of their personal innovations. We start via summarizing the discussions in existing literature on firm degree TFP boom and then quantitatively evaluate which channels are important for the TFP growth of chinese language corporations the usage of our panel records set.

4.1 Increase via Catching Up

A low TFP company catches up to excessive-TFP frontier companies thru technology spillover by means of imitation. Coe and Helpman (1995) and Coe et al. (1997) empirically display that overseas generation transfers to home corporations with the aid of their imitation of the advanced generation of foreign companies thru trading activities. furthermore, Branstetter (2001) compares the spillover effect from home companies and that from overseas firms and

points out that the former effect is extra vital. also, Fukao et al. (2011) show that low TFP firms generally tend to capture as much as domestic frontier corporations, who have a excessive TFP degree, but the tempo of catching up to world frontier companies, who have a fair higher TFP level, is slower than that to the home frontier. as a consequence, a few of the literature on growth with the aid of catching up, some claim that domestic frontier firms are greater important than overseas frontier companies as targets to trap up to.

4.2 Growth through improvements

whilst low TFP corporations can develop via catching up, high TFP firms have much less room to seize up, and they may be required to grow via their own improvements (Acemoglu et al. 2006). Aoki et al. (2017) argue that one of the causes of low productiveness boom in Japan is that japanese corporations couldn't transition smoothly from boom via catching up via imitating the era of U.S. corporations to boom by using their very own improvements. these research above have implications for the sustainability of future economic boom in China. that is, if China keeps to grow to a higher improvement level, its personal innovations becomes more essential. certainly, it's far mentioned that R&D investment in China has been energetic for the reason that 2000s (Fan 2018). discern 5 indicates a positive correlation between R&D expenditure and nominal GDP consistent with capita by means of usa. China's R&D expenditure is incredibly lively as compared with its mediocrity in per capita GDP. similarly, a few chinese language firms behavior R&D sports to acquire technology that has but to be mounted even by way of firms in advanced economies. as an example, here, the term spillover impact refers to, in specific terms, the externality to collect the effects of R&D sports with the aid of other corporations thru reverse engineering of traded goods and interactions among engineers consultant chinese language corporations inside the statistics era area adopt R&D funding actively for the realistic use of artificial Intelligence and virtual reality.

4.3 Empirical analysis

In this phase, we empirically analyze the determinants of TFP boom for listed firms in China primarily based at the discussions in current literature introduced in the previous segment. We use annual company-degree panel records from 2011 to 2016, and desk 3 indicates the descriptive statistics.

To start with, we estimate the subsequent equation.

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The subscripts, i , j , and t , constitute company, region, and time, respectively. Indicates export sales and is a proxy for trade sports. a few point out the importance of opposite engineering of imported items in generation spillover from foreign firms to chinese ones. To capture this form of effect, it's miles possible that we ought to use import related data as an explanatory variable rather than export sales.¹⁶ however, we use export sales because of information quandary. If there exists an effect of catching as much as overseas companies through exporting sports, can be high-quality. is the average TFP stage of home frontier companies in China, and represents the space of the TFP degree of each firm to the frontier. If corporations trap as much as the home frontier, will be wonderful suggests R&D expenditure by using every company. If R&D expenditure for its personal improvements outcomes in TFP boom, may be high-quality. in addition, to govern firm & length, sectoral characteristics, and time unique aggregate shocks, we upload sales, sectoral dummies $_$, and time dummies $_$ as explanatory variables.

Desk 4(1) suggests the estimation result of the equation. The effect of catching as much as the domestic frontier and that of R&D sports on TFP growth are statically large. In contrast, corporations with large export income do no longer always boom TFP growth, and based totally in this estimation end result, we can't verify the lifestyles of the effect of catching as much as overseas corporations through buying and selling sports.

Keller (2004) surveys the channels of global era spillover and argues that the channel thru uploading is vital while the channel via exporting is distinctly minor.

We are able to summarize the results as follows.

(i) Low TFP corporations have a tendency to seize up to domestic frontier firms.

(ii) R&D activities increase TFP increase.

(iii) We haven't any widespread end result for the impact of generation spillover from overseas companies in the experience that firms with large export sales have a tendency to have higher TFP increase.

4.4 Robustness test

This segment assesses the robustness of our baseline estimation effects within the previous segment.

First, we compare the robustness of our specification. desk 4(2) shows the estimation end result of the constant impact version, including firm particular dummies to the baseline specification, whilst desk four(3) suggests the estimation end result for the random effect version.

They display that the sign and significance of all primary elasticity, , and , do no longer change loads. in the meantime, the result of a Hausman check suggests that we have to appoint the constant impact model as opposed to the random impact model.

2d, we compare the robustness of our dataset. within the previous phase, we excluded companies with TFP boom in the pinnacle and backside one percentiles for each yr. in this segment, we use the complete sample and take a look at whether we've any meaningful distinction in our estimation consequences. furthermore, we exclude export income, whose coefficient isn't always great in our baseline estimation, and take a look at our results with a far larger pattern. desk 4(four) and 4(5) show the outcomes. we are able to locate that there may be no significant distinction in the signal and the significance for most important elasticity.

In light of these points, our estimation consequences are strong.

5. CONCLUSION

This paper discusses the resources of TFP growth in China using records on listed firms to gauge the sustainability of chinese economic growth. Particularly, we examine composition effect, in which high TFP companies replace low TFP ones, at the aggregate TFP and the elements that have an effect on the TFP increase of person firms.

I confirmed that as a regular example of the composition impact, since the 2000s the percentage of low-productiveness SOEs has constantly declined, whilst excessive-productiveness corporations have actively entered the marketplace. The Chinese language authorities shows a policy to push ahead the shakeout of unprofitable SOEs, although the authorities previously changed into now not so proactive on this regard.¹⁷ furthermore, the Chinese authorities has applied and accelerated a massive tax discount for task groups. These guidelines will contribute to improving the combination TFP thru accelerating the exit and access of corporations in the Chinese economic system.

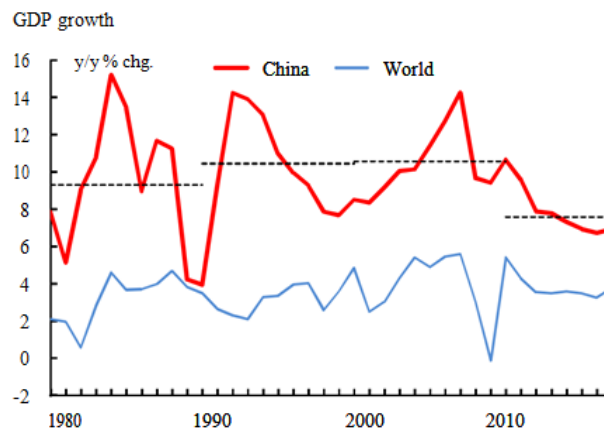
Similarly, despite the fact that we couldn't verify that technology spillover from foreign companies is a element that influences the TFP growth of individual firms, in part due to information issue, we confirmed that each the impact of catching as much as home frontier companies and the impact of R&D activities are vital in terms of TFP growth. As we confirmed in bankruptcy 2, there nevertheless exists a huge productivity hole between frontier corporations and different indexed companies. for this reason, the impact of catching up to the frontier will remain powerful. moreover, some corporations interact in active R&D sports to accumulate new era that has yet to be hooked up even by using companies in advanced economies because the Chinese government is presenting preferential treatment to aid the R&D activities of such companies, the impact of innovations through R&D activities will likely stay functioning.

The Chinese language financial system has been developing by means of around 7 percent annually. The trend of TFP boom is an important issue to recollect the sustainability thereof. the focal point of this take a look at is restricted to listed corporations in China, however at the least based on the evaluation, the chinese mixture TFP has extended through the following 4 channels: (i) declining share of low-productiveness state-owned establishments, (ii) continuous influx of exceedingly capable new start-ups, (iii) extensive catching up fashion some of the laggards within the firm distribution, and (iv) innovation spawning R&D activities. Assuming that these channels stay effective, the chinese financial system is likely to maintain its contemporary growth momentum.

The authorities' pastime report at countrywide people's Congress in 2016 indicates a policy to sell SOE reforms as one of the authorities' deliver aspect reforms. In response to this, at the executive assembly of the country Council in may additionally 2016, they proposed a few concrete measures which includes the disposal of 345 unprofitable SOEs. ¹⁸ In China, one form of preferential treatment is that the government reduce the corporate earnings tax charge from 25% to fifteen% for firms who are identified as "high tech firms intensively supported with the aid of the kingdom" in the event that they meet sure conditions, together with with appreciate to the R&D expenditure to revenue ratio.

One of the dangers that get worse the turnover of chinese language corporations is the decline in the financial intermediary function due to the escalation of the debt-overhang trouble specially within the company

Figure 1: Macroeconomic signals in China



The latest data are as of 2017. The lines indicate the average growing rate during 1980s, 1990s, 2000s and 2010-2017

Sources: IMF

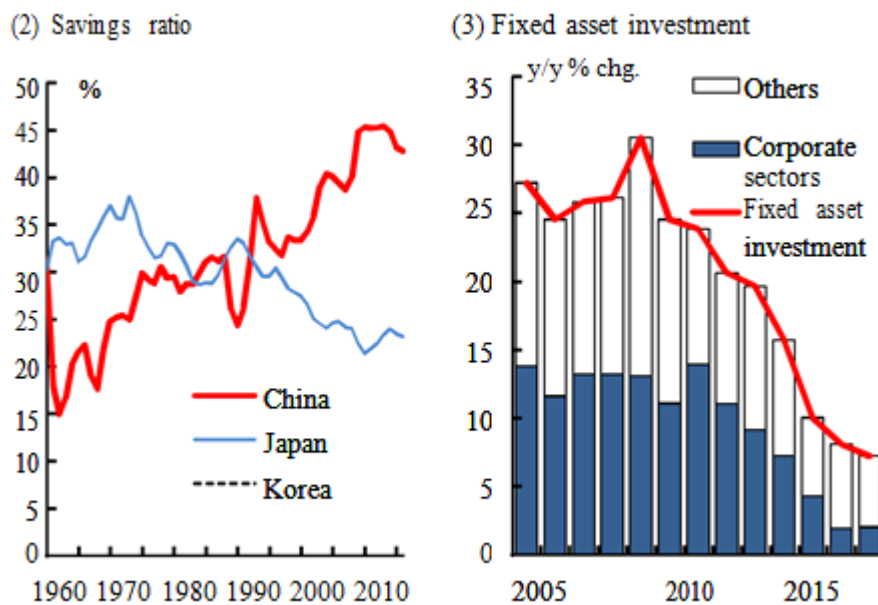
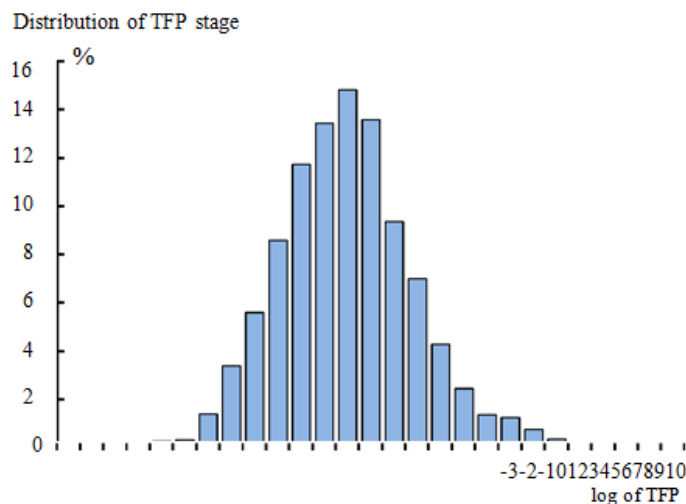
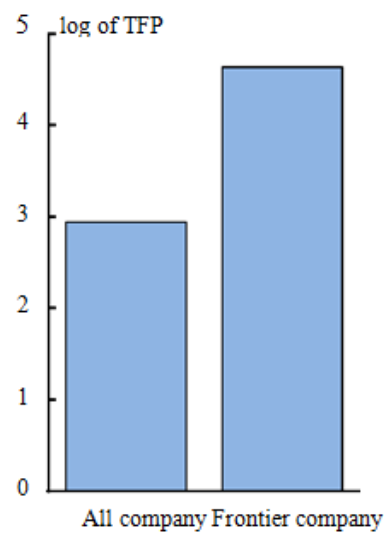


Figure 2: TFP level of listed companies

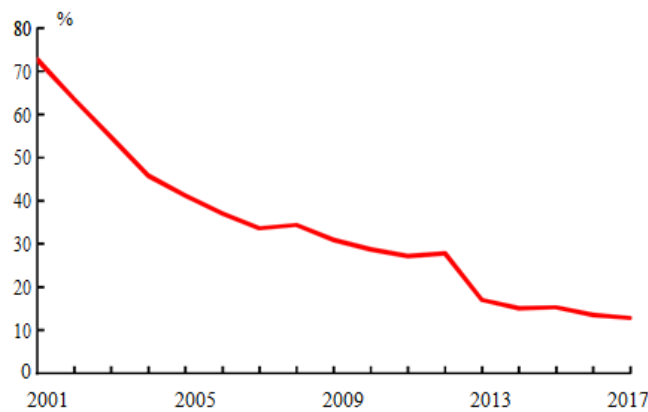


TFP level of all listed firms and frontier companies



Note. The data are as of 2016. The median of each class.

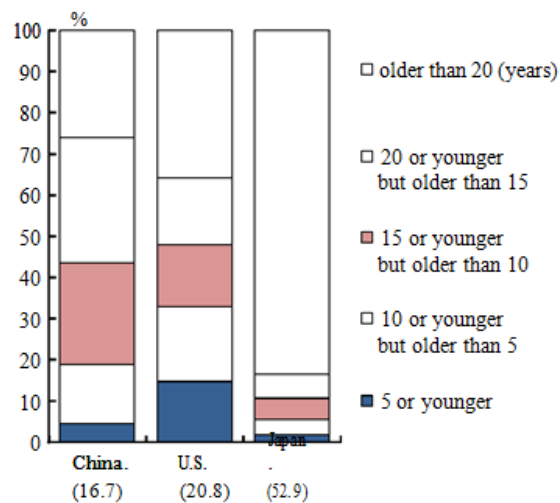
Figure 3: Section of S.O.Es in industry sector



Note: The proportion is in terms of total asset.

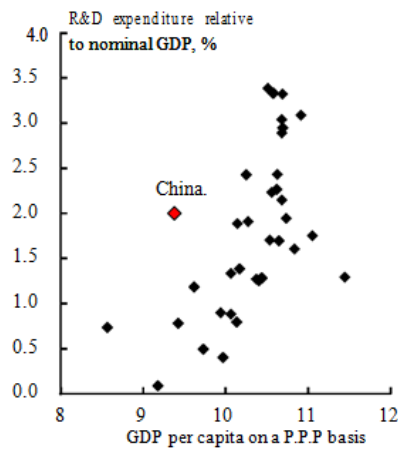
Source: CEIC

Figure 4: Age of listed companies



Source: Bloomberg

Figure 5: R and D expenditure by country



The data are the average of 2011, 2013, and 2015.

Sources: IMF

Table 1: TFP level and firms attributes

	Dependent variable: TFP level		
	(1) b/se	(2) b/se	(3) b/se
SOE dud	-0.17*** [0.03]		-0.13*** [0.03]
Firm level		-0.01*** [0.00]	-0.01*** [0.00]
Time dud	Yes	Yes	Yes
Industry dud	Yes	Yes	Yes
N	19,209	18,520	18,520
r ²	0.600	0.610	0.610

Table 2: Global top one thousand firms according to country

	Country/Region	Number of firms	Average firm age
1	U.S.	363	34
2	China.	91	22
3	Japan.	84	59
4	U.K.	48	36
5	France.	41	41
6	Germany.	34	29
7	Switzerland.	25	41
8	Canada.	34	37
9	Hong Kong.	28	31
10	Australia.	20	29

Notes: The above diagram shows companies whose market capitalization was in the world's top 1,000 in 2016.

The country is in order of the total concept of market capitalization.

Source: Bloomberg

Table 3: Summary statistics

	N	Mean.	sd.	Min.	Max.
TFP growth rate	14,790	-0.04	0.47	-2.31	2.29
Export sales	8,158	18.71	2.37	4.62	25.10
Distance to frontier	19,209	1.69	1.02	-5.34	9.24
R&D expenditure	18,372	17.10	1.68	6.04	23.59
Sales	27,117	20.97	1.66	7.60	28.67

Table 4: Estimation results

Single variables	Coe.	Dependent variable: TFP growth				
		(1)	(2)	(3)	(4)	(5)
		O.L.S b/se	Fixed effects b/se	Random effects b/se	O.L.S b/se	O.L.S b/se
Constant		-0.496*** [0.264]	-2.645*** [0.680]	-0.725*** [0.290]	-0.494*** [0.282]	-0.481*** [0.097]
Export	α	-0.002*** [0.004]	-0.005*** [0.009]	-0.004*** [0.004]	-0.004*** [0.004]	
Distance to frontier	α	0.158*** [0.008]	0.698*** [0.021]	0.203*** [0.009]	0.217*** [0.010]	0.138*** [0.005]
R and D Expense	α	0.017*** [0.007]	0.026*** [0.014]	0.018*** [0.007]	0.016*** [0.008]	0.008*** [0.004]
Sales	α	-0.019*** [0.007]	0.053*** [0.033]	-0.022*** [0.008]	-0.021*** [0.009]	-0.004*** [0.004]
Time dud		Yes	Yes	Yes	Yes	Yes
Industry dud		Yes	—	Yes	Yes	Yes
N		4,162	4,162	4,162	4,244	10,260
r ²		0.116	0.362	—	0.124	0.108

REFERENCES

- [1] Aoki, K., Hara, N., and Koga, M. (2017). Structural reforms, innovation and economic growth. Bank of Japan Working Paper Series, No. 17-E-2.
- [2] Aw, B. Y., Chen, X., and Roberts, M. J. (2001). Firm-level evidence on productivity differentials and turnover in Taiwanese manufacturing. *Journal of Development Economics*, 66(1), 51-86.
- [3] Branstetter, L. G. (2001). Are knowledge spillovers international or intranational in scope?: Microeconomic evidence from the US and Japan. *Journal of International Economics*, 53(1), 53-79.
- [4] Caballero, R. J., Hoshi, T., and Kashyap, A. K. (2008). Zombie lending and depressed restructuring in Japan. *American Economic Review*, 98(5), 1943-77.
- [5] Coe, D. T., and Helpman, E. (1995). International R&D spillovers. *European Economic Review*, 39(5), 859-887.
- [6] Coe, D. T., Helpman, E., and Hoffmaister, A. (1997). North-south R&D spillovers *The Economic Journal*, 107(440), 134-149.
- [7] Dollar, D., and Wei, S. J. (2007). Das (wasted) kapital: firm ownership and investment efficiency in China. NBER Working Papers 13103, National Bureau of Economic Research.
- [8] European Union Chamber of Commerce in China. (2016). Overcapacity in China: An Impediment to the party's reform agenda.