Policy Perspectives from the Bottom Up: What Do Firm-level Data Tell Us China Needs to Do?

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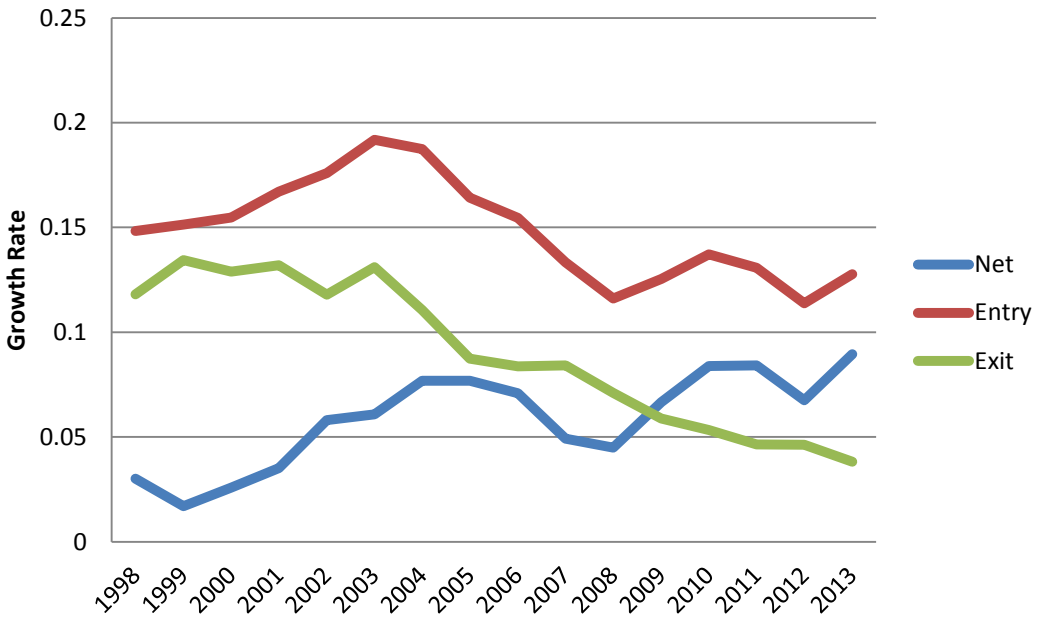
Argument in Brief

- Value in taking bottom-up perspective to complement usual top-down view that sees the Chinese economy only through the lens of macro aggregates (and imbalances)
- Key insight: Dynamism plus huge inefficiencies, with new firms especially important
- Sources of distortions and inefficiencies
  - Strategic (economic and military) objectives of the state
    - Import substitution
    - Domestic capabilities in *all* key and leading sectors
  - Important role of rents and patronage in the system
  - Incentive system facing local cadres and officials
- Major role of distortions: redistribution
- Most dynamic sectors: Those that have been most open, and free from the visible and distorting hand of the state
- Concern: Under current leadership, the economy and key sectors becoming less not more open and competitive, which has implications for growth moving forward

Critical Role of Manufacturing Sector

- Productivity growth on par with other Asian economies
- Source of much of the dynamism has been a highly competitive domestic market--courtesy of entry into WTO--which absorbs more than 85% of output (and even higher % of value added)
- New firms especially important
- But huge heterogeneity between sectors

New Firm Dynamics, Industry

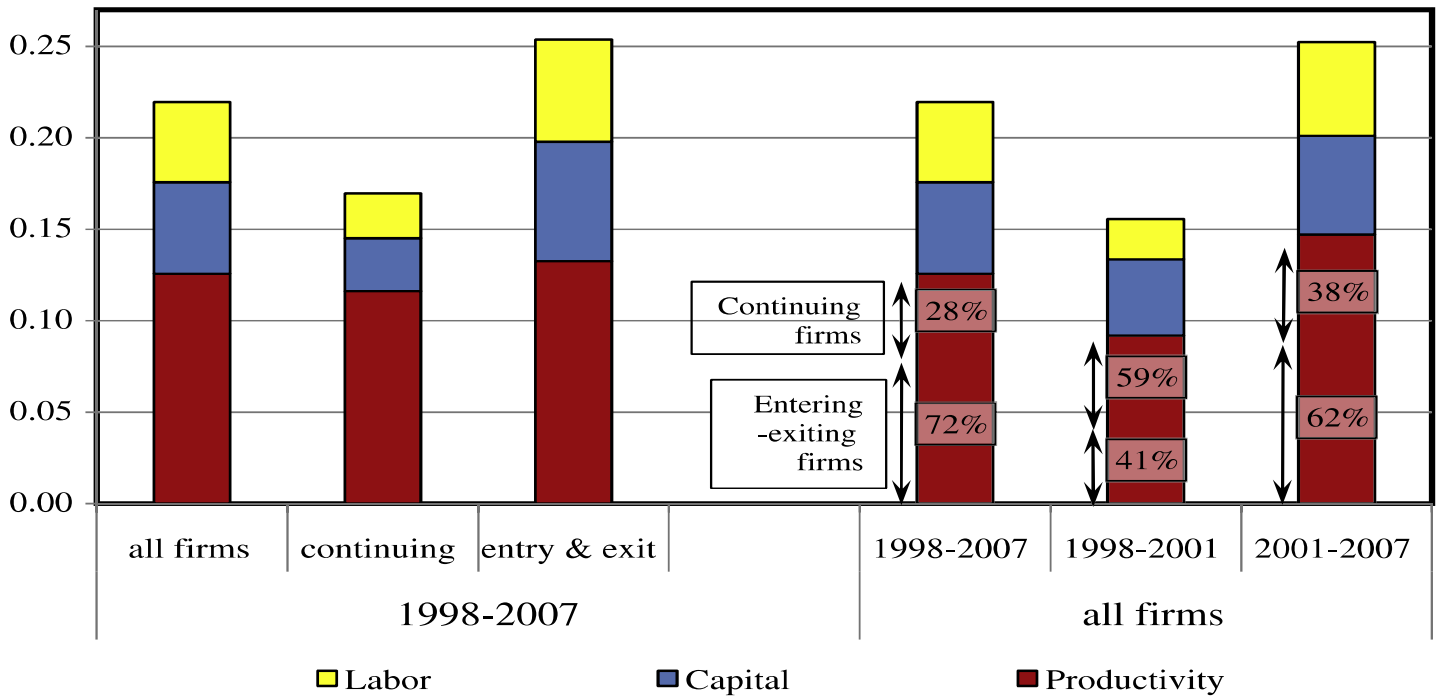


Source: Business Registry of Ministry of Industry and Commerce

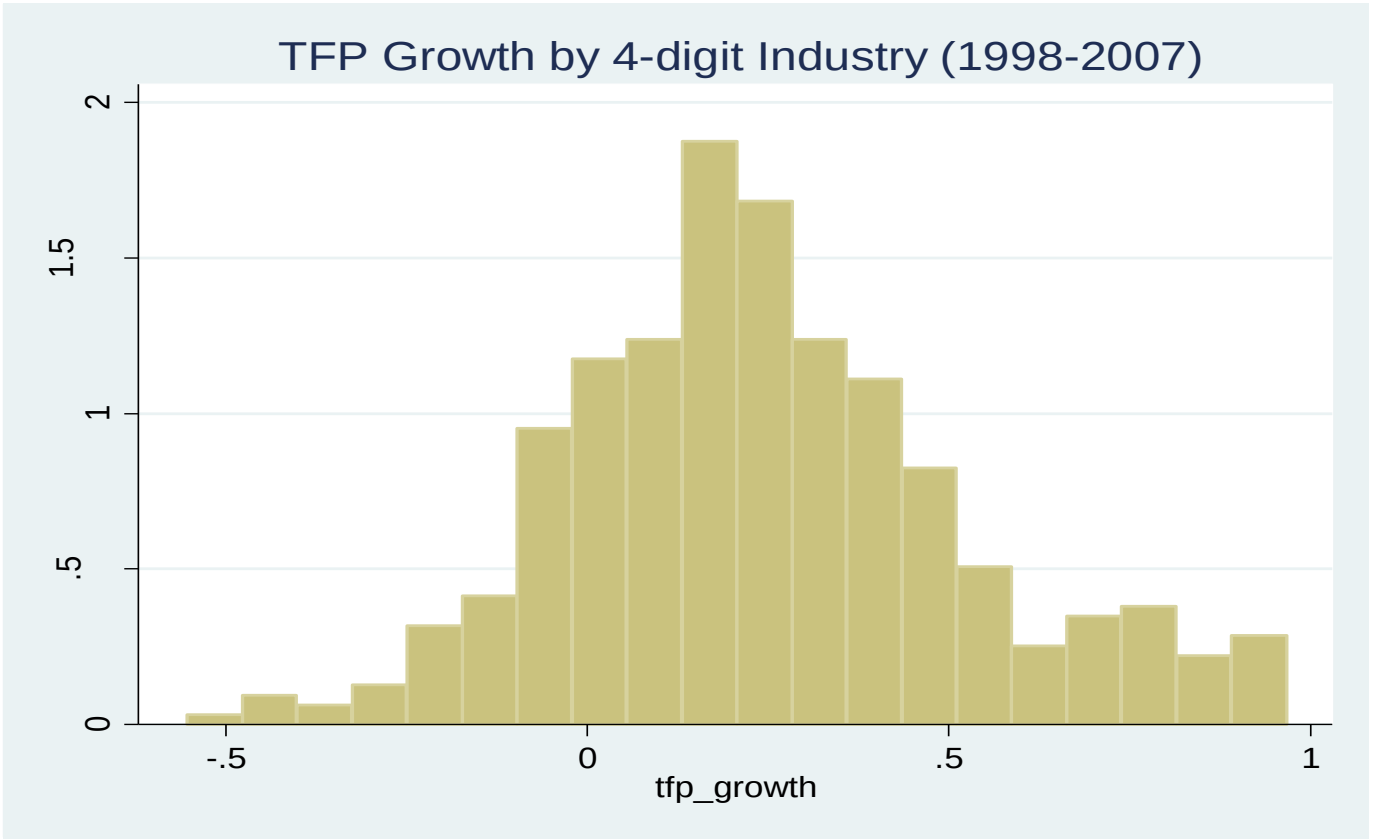
How Do New Firms Matter?

- Source of growth on both the extensive and intensive margin
  - Extensive: Draw more labor and capital into the economy
  - Intensive: Contribute to higher levels of TFP (total factor productivity) in the economy if better than incumbents
- Also put competitive pressure on "incumbent" firms

Output and Productivity Decompositions



Source: Brandt et. al. (2012).


TFP Growth by 4-digit Industry (1998-2007)
0
.5
1
1.5
2
-.5
0
.5
1
tfp_growth

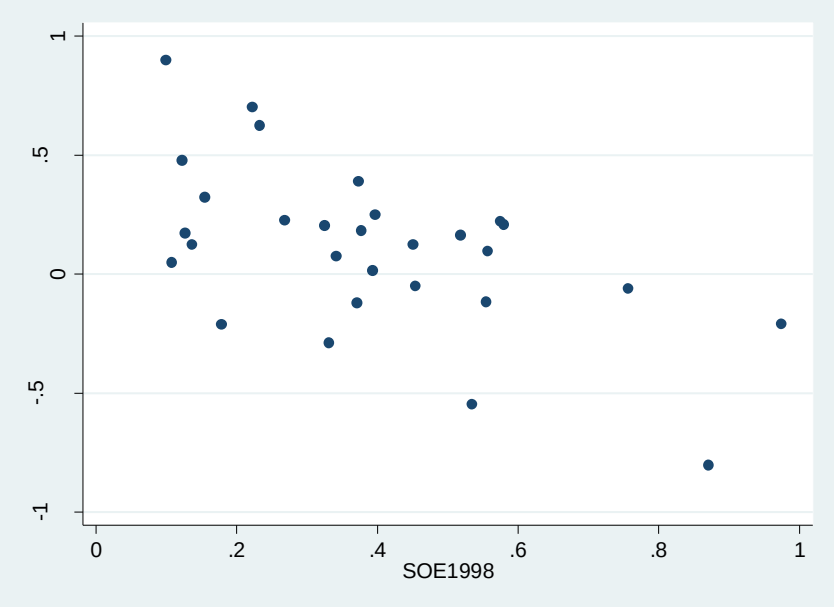
SOEs and TFP Growth

		Sources of Change in TFP			
Sectors	Total Change in ln TFP	Within	Between	Entry	Exit
SOE Share > 0.50	-0.117	-0.048	0.007	-0.080	0.004
Soe Share < 0.50	0.208	0.050	-0.024	0.175	0.007
All Sectors	0.107	0.019	-0.014	0.096	0.006

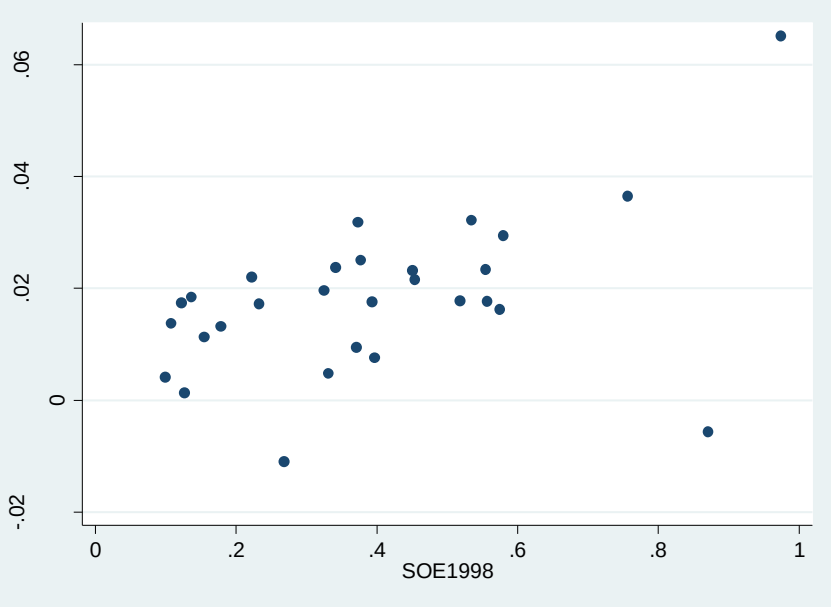
Based on TFP estimates from Brandt, Van Biesebroeck, Wang and Zhang (2015).

Impact of SOEs

TFP Growth and SOE Share



Profitability and SOE Share



Differences Among SOE-Dominated Sectors

	SOE Share		Change in TFP	Contribution to TFP			
Sector	1998	2007		Within	Between	Entry	Exit
"Better Perfoming" SOE-dominated Sectors							
Special Purpose Machinery	0.58	0.43	0.21	0.07	-0.01	0.15	0.00
Transport Equipment	0.52	0.39	0.16	0.07	-0.02	0.11	0.00
"Average" SOE-dominated Sector							
Smelting of Ferrous Metals	0.76	0.60	-0.06	-0.01	0.00	-0.04	-0.01
Chemical Products	0.55	0.41	-0.12	-0.06	0.00	-0.06	0.00
"Poorly Performing" SOE-dominated Sectors							
Smelting of Non-ferrous Met	0.53	0.52	-0.55	-0.21	0.06	-0.39	-0.01
Processing of Petroleum	0.87	0.75	-0.80	-0.31	0.08	-0.57	0.00

Common Elements of Most Dynamic Sectors

- Lower entry barriers for new firms
- Reduced market power of the SOEs
- Less discriminatory state procurement policy
- Liberal environment for FDI, including fewer restrictions on forms of technology transfer and M&A
- Falling tariff and non-tariff barriers

Effect of Tariffs on Domestic Price Level, 1998-2007

	Dependent variable: index of the Chinese domestic price level at the sector (2-digit) or industry (4-digit) level				
	All goods	Materials	Intermediate inputs	Capital goods	Consumer goods
	(1)	(2)	(3)	(4)	(5)
IV, 2-digit with IV					
Import tariff	0.255***	0.298	0.442***	0.182	-0.085
	(0.092)	(0.244)	(0.169)	(0.158)	(0.089)
Obs.	4,240	70	1,950	1,180	980
IV, 4-digit where available and 2-digit elsewhere					
Import tariff	0.296***	0.321	0.493***	0.174**	0.011
	(0.090)	(0.212)	(0.191)	(0.088)	(0.106)
Obs.	4,240	70	1,950	1,180	980

Source: Brandt, Van Biesebroeck, Wang and Zhang, 2016

Effect of protectionism at the firm level, 1998-2007

	Productivity			Markups		
	levels	levels	levels	levels	levels	levels
	OLS	IV	IV	OLS	IV	IV
	(1)	(2)	(3)	(1)	(2)	(3)
Output tariff (lagged)	-0.346***	-0.367**	-0.368**	0.109***	0.124***	0.124***
	(0.122)	(0.147)	(0.147)	(0.039)	(0.045)	(0.045)
Input tariff (lagged)	-0.534	-0.457	-0.467	-0.148	-0.330***	-0.334***
	(0.326)	(0.396)	(0.395)	(0.103)	(0.124)	(0.125)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Control variables			Yes			Yes
Observations	1,017,463	1,017,463	1,015,814	1,025,653	1,025,653	1,024,038

Decomposing the industry-level effect of tariff reductions

	Total effect	Within	Between	Entry	-Exit
IV estimates pooling 2 sub-periods (1998-2001 and 2001-2007)					
	(1a)	(2a)	(3a)	(4a)	(5a)
Change in Output tariff	-0.536***	-0.159*	0.035	-0.447***	0.035**
	(0.164)	(0.088)	(0.028)	(0.111)	(0.015)
Change in Input tariff	-0.713***	-0.304	0.279***	-0.620***	-0.067*
	(0.391)	(0.211)	(0.067)	(0.265)	(0.037)
IV estimates with sector FE pooling 2 sub-periods					
	(1b)	(2b)	(3b)	(4b)	(5b)
Change in Output tariff	-0.557***	-0.198**	0.017	-0.406***	0.029
	(0.146)	(0.085)	(0.031)	(0.105)	(0.018)
Change in Input tariff	-0.535	-0.070	0.356***	-0.754***	-0.067
	(0.332)	(0.193)	(0.071)	(0.238)	(0.041)
Number of observations	844	844	844	844	844

A Tale of Two Sectors
Autos versus Heavy Construction Equipment

- Similar in numerous respects
  - Mature industries, with relatively well-defined technological paradigms
  - Success in both sectors in other leading Asian economies
    - Japan
    - Korea
  - Length of quality ladders similar (Khandewal)
  - China also benefitted from a potentially larger domestic market, with huge lower end in both sectors that provided "natural protection" to help foster development
- But major differences in outcomes and current strength of local (Chinese) firms

Heavy Construction Equipment

- **Wheel-loaders**: Market consolidation, with four-firm concentration ratio rising from 43.5% in 1997 to 62.2% in 2010; by 2014, nearly 70%**. Of the top four, three are Chinese.**
- **Mid-size Excavators**: CLSA test of 13 leading excavator brands in China, performed over 185 working hours during a two week period in 2013.

Test	Champion	No. 2	No. 3	No. 4	No. 5
Work-cycle	Caterpillar	Sany	Komatsu	Doosan	Hitachi
Productivity	Caterpillar	Sany	Komatsu	Doosan	Hitachi
Fuel-saving	Sany	Caterpillar	Hitachi	Komatsu	Doosan
Durability Assessment	Caterpillar	Sany	Doosan	Komatsu	Hitachi
Ease of Operation	Komatsu	Caterpillar	Sany	Hitachi	Doosan
Overall Rating	**Caterpillar**	**Sany**	**Komatsu**	**Doosan**	**Hitachi**

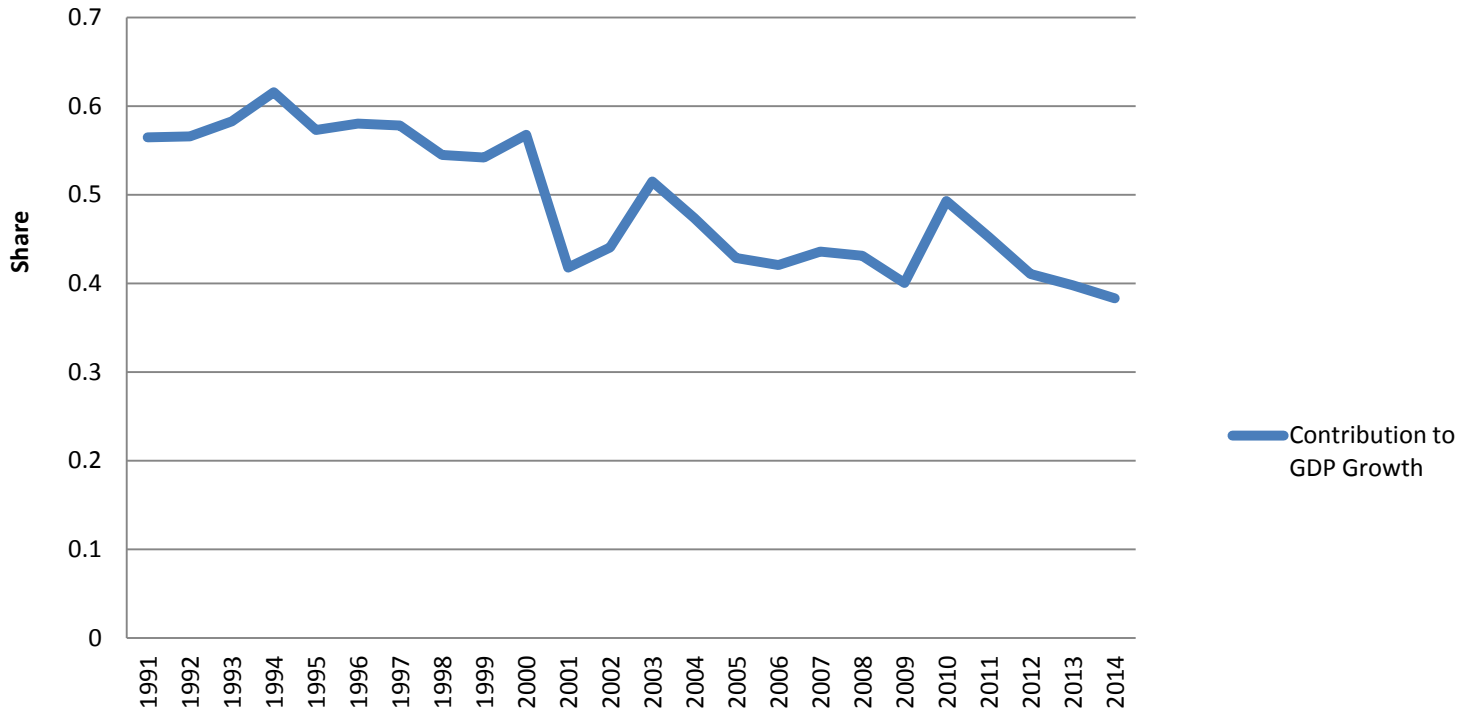
Overall, CLSA found that "**technology gaps are non-existent** between top-tier Chinese and international companies…" (CLSA 2013)

Autos
Top 5 Models by Segment, 2012

	A-segment	B-Segment	C-Segment	D-Segment
Sales Rank				
1	Chery QQ3	Chevrolet Sail	Ford Focus	VW Passat
2	Changan Benben	VW Polo	Buick Excelle	VW Santana
3	Suzuki Alto	Kia K2	VW Lavida	VW Magotan
4	BYD F0	Honda City	VW Jetta	Toyota Camry
5	Lifan 320	FAW Xiali N5	Chevrolet Cruze	Nissan Teana

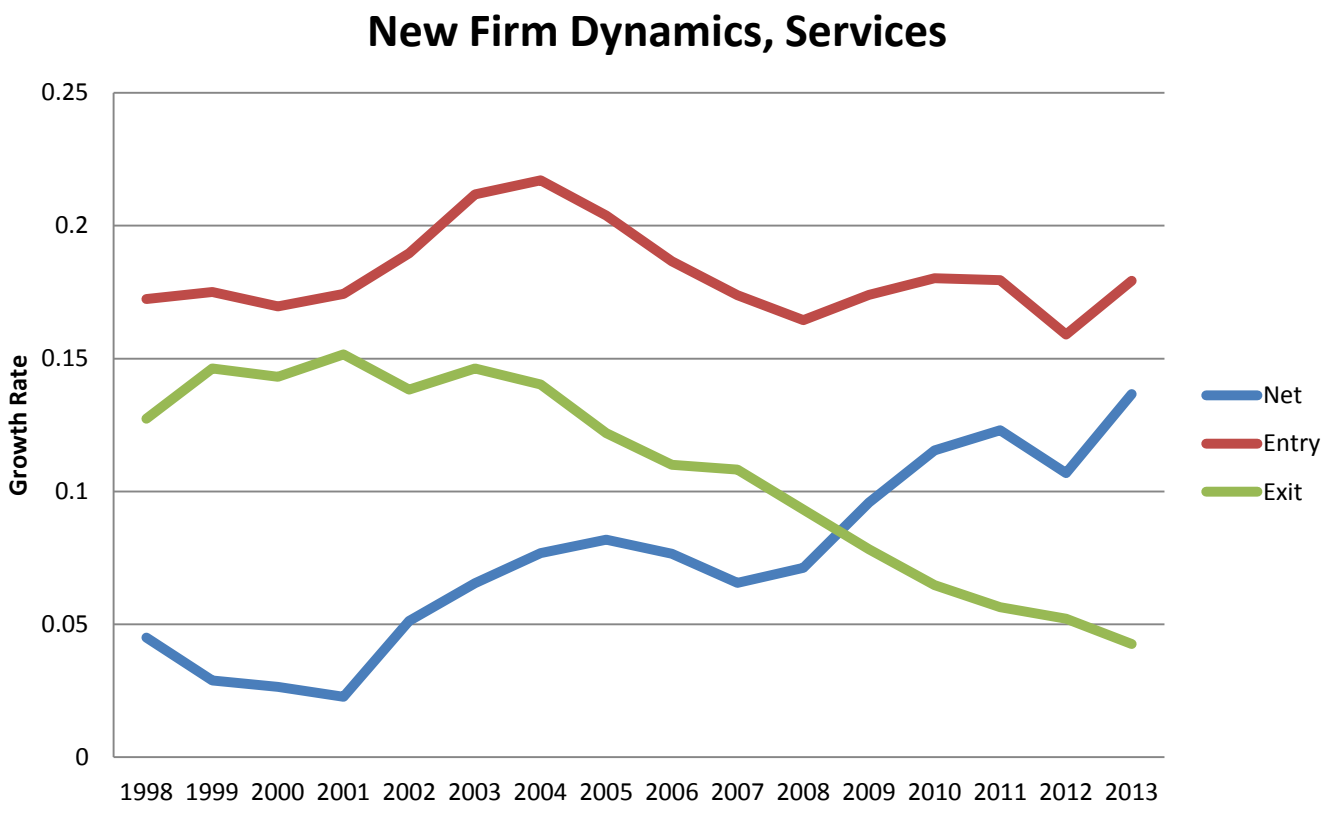
"The leading Chinese products now have bodies, safety and suspension hardware that are largely competitive. But they are behind on engine technology and are also let down by assembly standards, material choices, systems integration, refinement, and a lack of final development and testing. **They are still a long way from being genuinely 'world class.**" Bernstein 2012

Declining Contribution of Industry to Annual Real GDP Growth



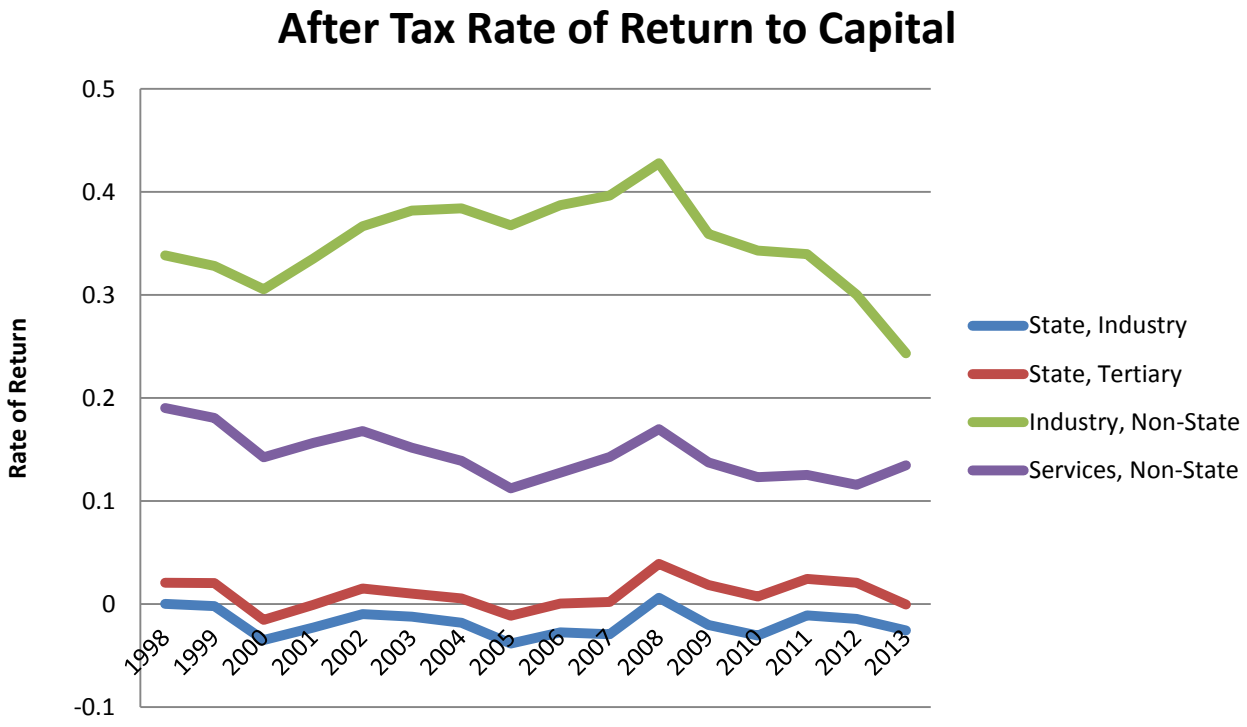
Incorporating the Tertiary Sector

- Contribution rising since early 1990s; today, even larger than industry in terms of GDP and employment
- Highly segmented
  - SOEs: Often dominate most capital and skill-labor intensive sectors
  - NSOEs: Largely the residual; left to absorb much of the increase in the labor force that can't find jobs elsewhere, including those laid off from the SOEs
  - Limited role for MNCs


New Firm Dynamics, Services
Growth Rate
0.25
0.2
0.15
0.1
0.05
0
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Net
Entry
Exit

Case of Telecom

- Sector monopolized by three state-owned carriers, each of which has a listed arm
- Broadband
  - CM, CT, CU are the backbone of system; retail internet providers are largely private but depend on operators for connectivity
  - High retail rates due to high interconnection rates
  - Monopoly tied to efforts to regulate internet content
- Mobile Services
  - Lower rates but low rates of capacity utilization of network (35% or less in 2014), implying low productivity
  - Regulators required operators late in 2014 to open up network to MVNO
  - MNVO having hard time offering competitive rates b/c of high interconnection terms
- Recent reforms
  - Opened up sector to private sector but
  - Huge subsidies to Chinese-owned firms
  - Foreign firms required to localize R&D and IP
  - Development of Chinese-technical standards
  - Discriminatory procurement policy



Based on updated calculations from Brandt and Zhu (2010).

Final Thoughts

- Dealing with key price distortions (interest rates, electricity and exchange rate) may help deal with the imbalances and improve productivity
- Distortions extend much further however and are deeply embedded in the system
- Near term:
  - Indications of declining productivity
  - Selection mechanism in and out of industry possibly weaker
  - Enormous amounts of policy uncertainty