The Great Gamble:
Global Ambitions and Domestic Challenges, China in the 21st Century

Barry Naughton

UC San Diego

UNAM February 23, 2018

Outline: Three Lectures

Monday: China has been the most successful economy ever, but the period of very high speed growth is now over. Chinese leaders have decided to push hard for continued "medium high speed growth."

Wednesday: The Chinese economic system is evolving rapidly, but ot to a familiar mixed market economy. Rather it is a market based system with (sometimes clumsy) top down control through money and through the Communist Party.

Today: Numerous large-scale and expensive initiatives are underway, which we will describe. These are growing very rapidly and present many new challenges. These are much larger in scope than traditional government initiatives and different in type. There will be successes, but there are many associated risks: this is a huge gamble.

Pushing For Growth

- In the early Xi Jinping administration, it was possible that economic reform and “the market as the decisive influence” would be the dominant goal of policy; that has not happened.
- Many ambitious initiatives have been gradually incorporated into plans. Gradually, Xi Jinping has endorsed them and identified personally with their success.
- These look like “traditional” state-directed programs but they are actually unprecedented, and a large change from the China of a decade ago.

1. Three Main “Baskets” of Programs

A. Techno-industrial Policies: Massive programs of infant industry support, far bigger than any known previously, focused on emerging and future industries.

B. Infrastructure construction linking China with its Asian neighbors—the Belt and Road Initiative. Moving directly from domestic infrastructure to cross-border infrastructure.

C. Rebuilding urban structures on a massive scale: three major metropolitan areas to be reconstructed.

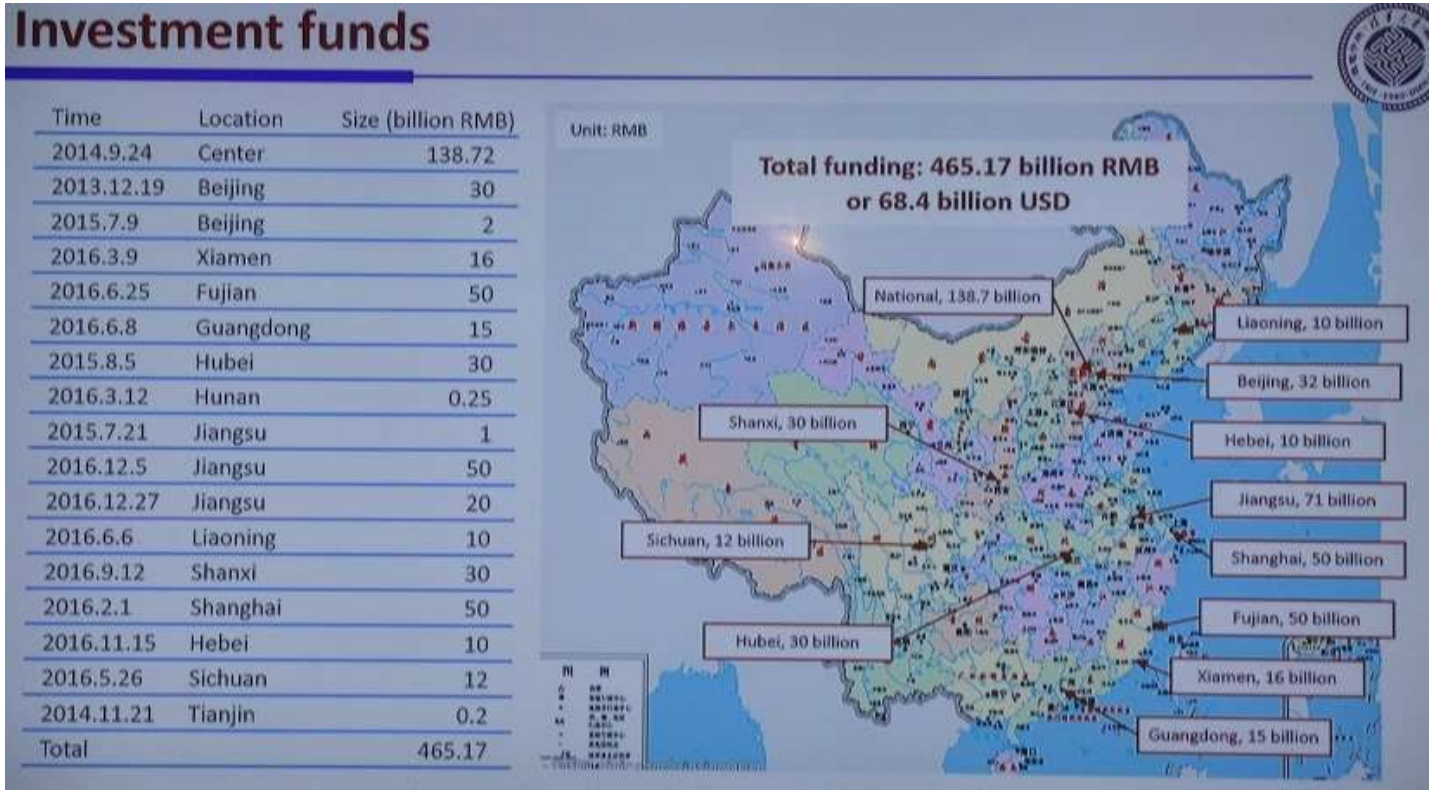
These policies are huge and risky, but they also have a foundation in China’s broader investment and development.

A. Extremely rapid growth in outlays for "Techno-Industrial Policy"

- Fifteen years ago, China spent almost nothing on industrial policy. In the immediate wake of the global financial crisis (2009), a new "Mega-projects," program received $5 billion annually.
- By 2010-2011, the Strategic Emerging Industries (SEI) program was approaching $100 billion annual support for all new industries.
- Today, industrial policy commitments are in the hundreds of billion US dollars.
  - Semiconductor Funds: $69 billion verified, heading to $120 billion.
  - Electric vehicles: $50-100 billion guesstimate.
  - Many Individual sectors: Advanced manufacturing ($3 billion); Merics identified $6-7 billion in support for industrial robotics.
- The old funding commitments haven'tdisappeared: this is largely cumulative. For comparison: the US government annual supports for about $50 billion for research and development, mostly medical.

By end 2016, announced semiconductor investment funds totaled US $69 billion.

- Semiconductor investment funds have been established in at least 14 provinces, in addition to the large national fund.
- Some of these provinces don’t have semiconductor industries.
- Semiconductor industry is probably the most extreme case.



Time	Location	Size (billion RMB)
2014.9.24	Center	138.72
2013.12.19	Beijing	30
2015.7.9	Beijing	2
2016.3.9	Xiamen	16
2016.6.25	Fujian	50
2016.6.8	Guangdong	15
2015.8.5	Hubei	30
2016.3.12	Hunan	0.25
2015.7.21	Jiangsu	1
2016.12.5	Jiangsu	50
2016.12.27	Jiangsu	20
2016.6.6	Liaoning	10
2016.9.12	Shanxi	30
2016.2.1	Shanghai	50
2016.11.15	Hebei	10
2016.5.26	Sichuan	12
2014.11.21	Tianjin	0.2
Total		465.17

Policy Instruments: Multiple, Overlapping, Cumulative

- After 2006, Chinese industrial policy-makers rapidly developed a basked of overlapping ***targeted*** polices:
  - Subsidies and tax breaks to producers;
  - Demand-side subsidization (e.g., electric vehicles);
  - Technical standard-setting that privileges domestic firms;
  - Procurement preferences;
  - Strategic targets that serve a coordination function
- Since 2014, rapid roll-out of
  - Programs such as Innovation-Driven Development; Made in China 2025; and Internet Plus. These are in principle better, because they are less targeted and envisage raising capabilities throughout the economy.
  - Establish funding mechanisms that have some role for competitive project selection and rates of return analysis.
- However, none of these instruments are “sunset,” they all persist and overlap.

Result:

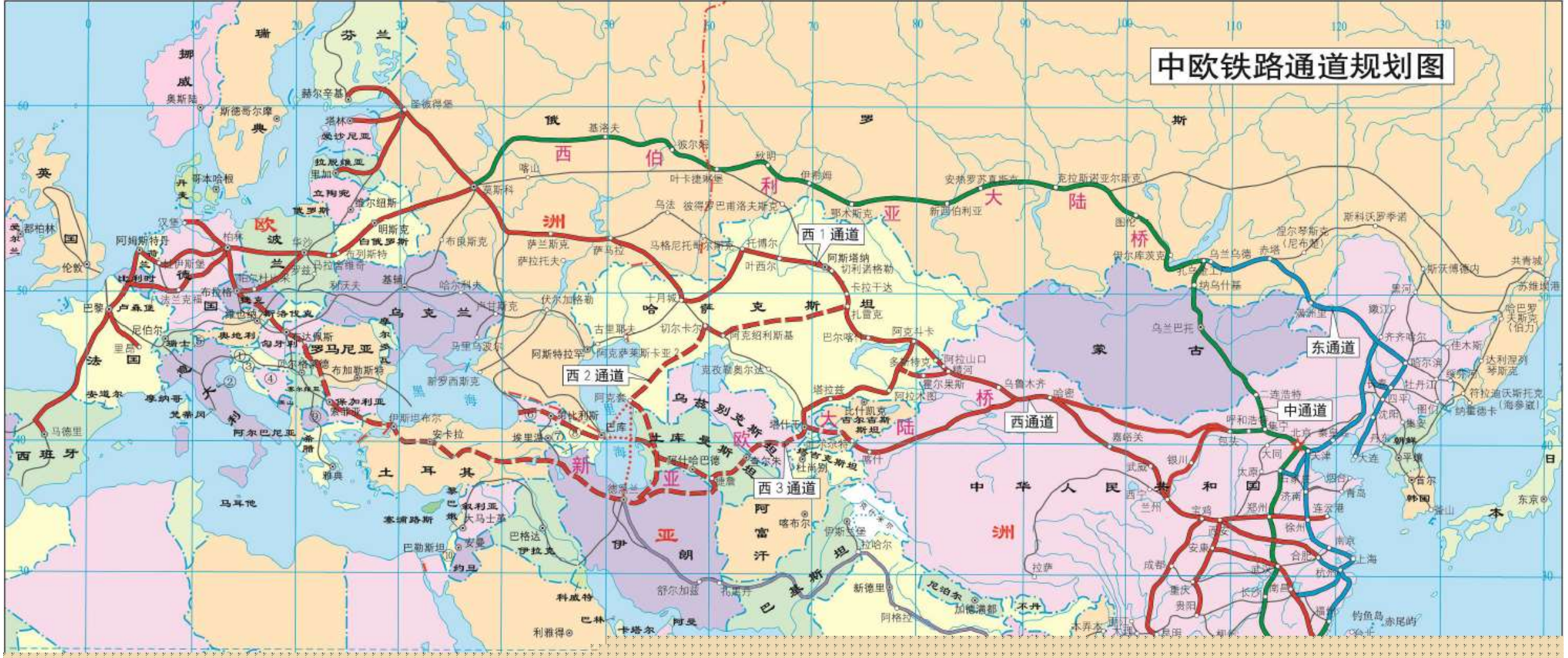
- Nobody really knows how much money is being spent;
- There are evaluations of the effectiveness of programs, but they are never public and we don’t know the criteria or the outcomes. Nobody knows how effectively the money is being spent.
- How do the incentives and protectionist measures affect upstream and downstream industries?
- Do these policies actually end up fostering high tech industrial development?
- Semiconductor industry fund: equivalent to $50 from every man, woman and child in China.

A new technological frontier:

- Artificial intelligence is enabled by Big Data
- Artificial intelligence: Don’t think of IBM’s Watson, a stand-alone genius computer.
- Artificial intelligence: Think of cheap, on-demand processing services, like a utility, that makes many products work (or work better).
- The operator with the biggest data set has an intrinsic advantage: Google is the leader.
- China has the largest data sets because:
  - 1.32 billion mobile phone users, who conduct, on average more business on their phones than Europeans or Americans do.
  - Government that actively cooperates with internet businesses to collect and analyze data (Cf. MERICs “Social Credit” Report).
  - Absence of privacy protections.

B. Massive Transport Infrastructure Construction: Belt and Road Initiative.

1. Completion of China's high-speed transport infrastructure—both rail and highway—has been important and is well known. It is also nearing completion.
2. As a successor, the "Belt and Road Initiative" has gotten the most attention. Although so far outlays have been modest, the ambitious objectives should be taken seriously.
3. Be very careful with the definition of the "Belt and Road initiative." In fact, "one belt and one road" directs attention away from the reality, which is a single Chinese hub with multiple spokes, and Southeast Asia is by far the economically most significantly spoke(s).


中欧铁路通道规划图
西伯利亚大陆桥
欧亚大陆桥
西1通道
西2通道
西3通道
西通道
中通道
东通道
俄罗斯
哈萨克斯坦
乌兰巴托
蒙古
中华人民共和国
乌克兰
罗马尼亚
土耳其
伊朗
阿富汗
巴基斯坦
乌兹别克斯坦
吉尔吉斯斯坦
塔吉克斯坦
白俄罗斯
波兰
德国
法国
英国
瑞士
意大利
西班牙
葡萄牙
挪威
瑞典
芬兰
丹麦
荷兰
比利时
奥地利
匈牙利
捷克
斯洛伐克
希腊
马耳他
日本
朝鲜
韩国
东京
首尔
平壤
大连
天津
北京
上海
南京
杭州
武汉
重庆
成都
西安
郑州
济南
连云港
乌鲁木齐
阿拉山口
霍尔果斯
阿克苏
喀什
伊斯坦堡
莫斯科
圣彼得堡
基洛夫
彼尔姆
秋明
伊尔姆
鄂木斯克
新西伯利亚
克拉斯诺亚尔斯克
安热罗苏丹斯克
伊尔库茨克
乌兰乌德
赤塔
哈尔滨
长春
沈阳
大同
太原
呼和浩特
银川
兰州
西宁
拉萨
昆明
贵阳
长沙
南昌
合肥
福州
广州
海口
台北
钓鱼岛
赤尾屿
冲绳
伦敦
巴黎
柏林
罗马
雅典
马德里
里斯本
都柏林
奥斯陆
斯德哥尔摩
赫尔辛基
哥本哈根
华沙
布拉格
维也纳
布达佩斯
布加勒斯特
索菲亚
贝尔格莱德
萨拉热窝
萨格勒布
斯科普里
地拉那
雅典
安卡拉
伊斯坦布尔
开罗
阿尔及尔
突尼斯
的黎波里
开罗
耶路撒冷
贝鲁特
大马士革
安曼
巴格达
德黑兰
喀布尔
伊斯兰堡
拉哈尔
新德里
阿格拉
加德满都
达卡
仰光
曼谷
河内
万象
金边
吉隆坡
雅加达
马尼拉
科威特
巴林
卡塔尔
阿曼
利雅得
巴勒斯坦
约旦
塞浦路斯
马耳他
摩纳哥
安道尔
梵蒂冈
圣马力诺
卢森堡
阿姆斯特丹
布鲁塞尔
日内瓦
苏黎世
慕尼黑
法兰克福
汉堡
柏林
华沙
明斯克
基辅
哈尔科夫
顿涅茨克
莫斯科
喀山
萨马拉
萨拉托夫
伏尔加格勒
十月城
切尔卡尔
阿克纠利斯基
阿克萨莱斯卡亚
阿斯特拉罕
古里耶夫
马里乌波尔
新罗西斯克
克孜勒奥尔达
塔拉兹
塔什干
阿拉木图
比什凯克
乌鲁木齐
哈密
嘉峪关
兰州
西宁
银川
呼和浩特
包头
大同
太原
石家庄
济南
郑州
西安
宝鸡
安康
成都
重庆
贵阳
昆明
长沙
南昌
合肥
武汉
南京
上海
杭州
福州
广州
海口
台北
钓鱼岛
赤尾屿
冲绳
东京
首尔
平壤
大连
天津
北京
满洲里
二连浩特
乌兰巴托
图们
延吉
佳木斯
哈尔滨
齐齐哈尔
黑河
海参崴
符拉迪沃斯托克
纳霍德卡
哈巴罗夫斯克
共青城
苏维埃港
斯科沃罗季诺
乌兰乌德
赤塔
伊尔库茨克
克拉斯诺亚尔斯克
安热罗苏丹斯克
新西伯利亚
鄂木斯克
伊尔姆
秋明
彼尔姆
基洛夫
圣彼得堡
莫斯科
喀山
萨马拉
萨拉托夫
伏尔加格勒
十月城
切尔卡尔
阿克纠利斯基
阿克萨莱斯卡亚
阿斯特拉罕
古里耶夫
马里乌波尔
新罗西斯克
克孜勒奥尔达
塔拉兹
塔什干
阿拉木图
比什凯克
乌鲁木齐
阿拉山口
霍尔果斯
阿克苏
喀什
伊斯坦堡
莫斯科
圣彼得堡
基洛夫
彼尔姆
秋明
伊尔姆
鄂木斯克
新西伯利亚
克拉斯诺亚尔斯克
安热罗苏丹斯克
伊尔库茨克
乌兰乌德
赤塔
哈尔滨
长春
沈阳
大同
太原
呼和浩特
银川
兰州
西宁
拉萨
昆明
贵阳
长沙
南昌
合肥

2. A Huge Gamble

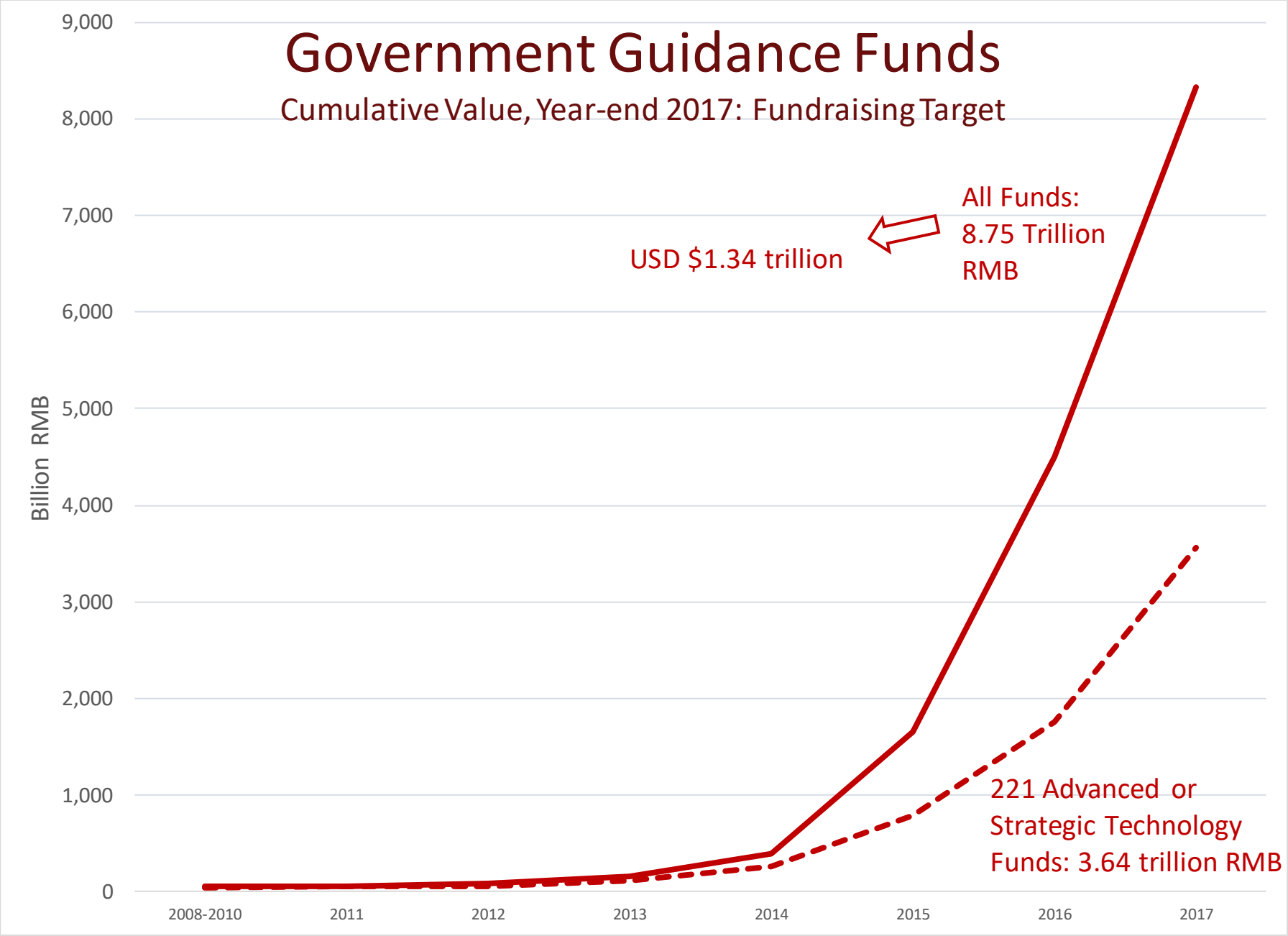
- These programs are all reasonably well conceived. They envision changes that are likely to take place under market conditions and create polices to accelerate them.
- Some will certainly succeed: it is unquestionable that China will emerge as the world's largest economy (at market exchange rates) and a primary technology power over the next twenty years.
- However, the scale, direction, and acceleration of these policies creates substantial sources of risk.
- Each of these is a potential source of problems.

2a. Strengthened State Enterprises as Instruments of Ambitious National Goals

- Aggregate importance of SOEs has declined, but the largest SOEs are being groomed and strengthened to be strong international actors.
- China Development Bank has been recapitalized by $48 billion in funds In July 2015, “repurposed” as a government-directed development bank.
- Inclusion of Communist Party in strategic decision-making of SOEs is in part designed insure alignment between national goals and enterprise decisions.
- Establishment of “state capital investment and operation funds” designed to provide strategic goals to SOEs and include them in their reward functions.

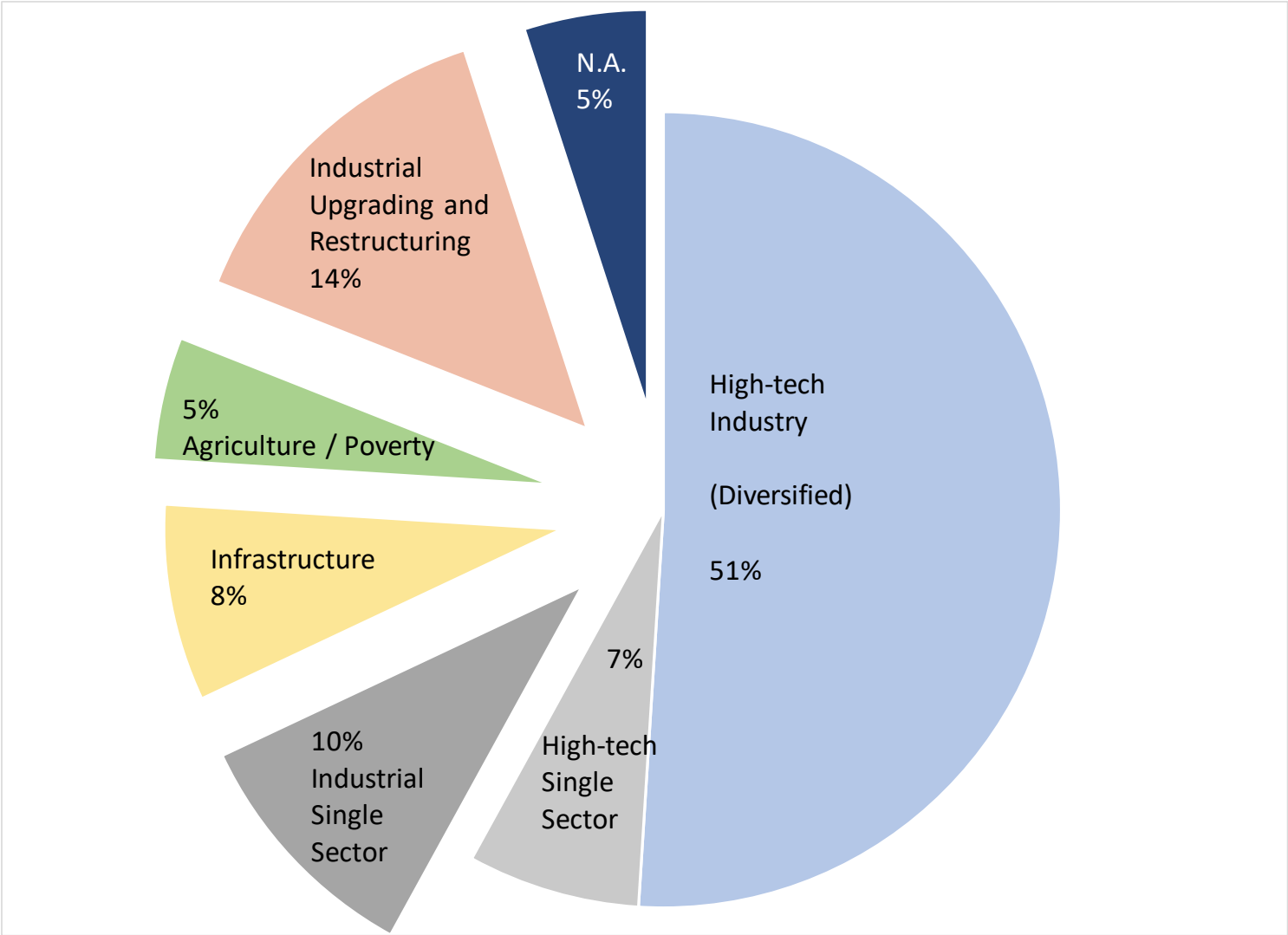
Financialization and “Reform” of State Enterprise System

- Last time, we described the new corporate governance system and rapid “financialization” that are transforming the Chinese state-owned enterprise (SOE) sector.
  - Events in 2017-2018 have accelerated substantially, following years of vacillation.
  - The 2013 Third Plenum made a few cryptic comments about managing “capital” rather than “assets,” but the best ideas were rejected.
- Objective: less intrusive management and more arms-length, finance-based control but also more effective Communist Party control.
- These changes are designed to give state-owned entities more resources and more flexibility in using them. “Mixed ownership” in particular is a complex concept. Much more money will be running through the state sector, especially as government-run “industrial guidance” funds.



Source: Zero2IPO and company websites; $1=6.53 RMB (year-end 2017)

Sectoral Composition of Government Guidance Funds



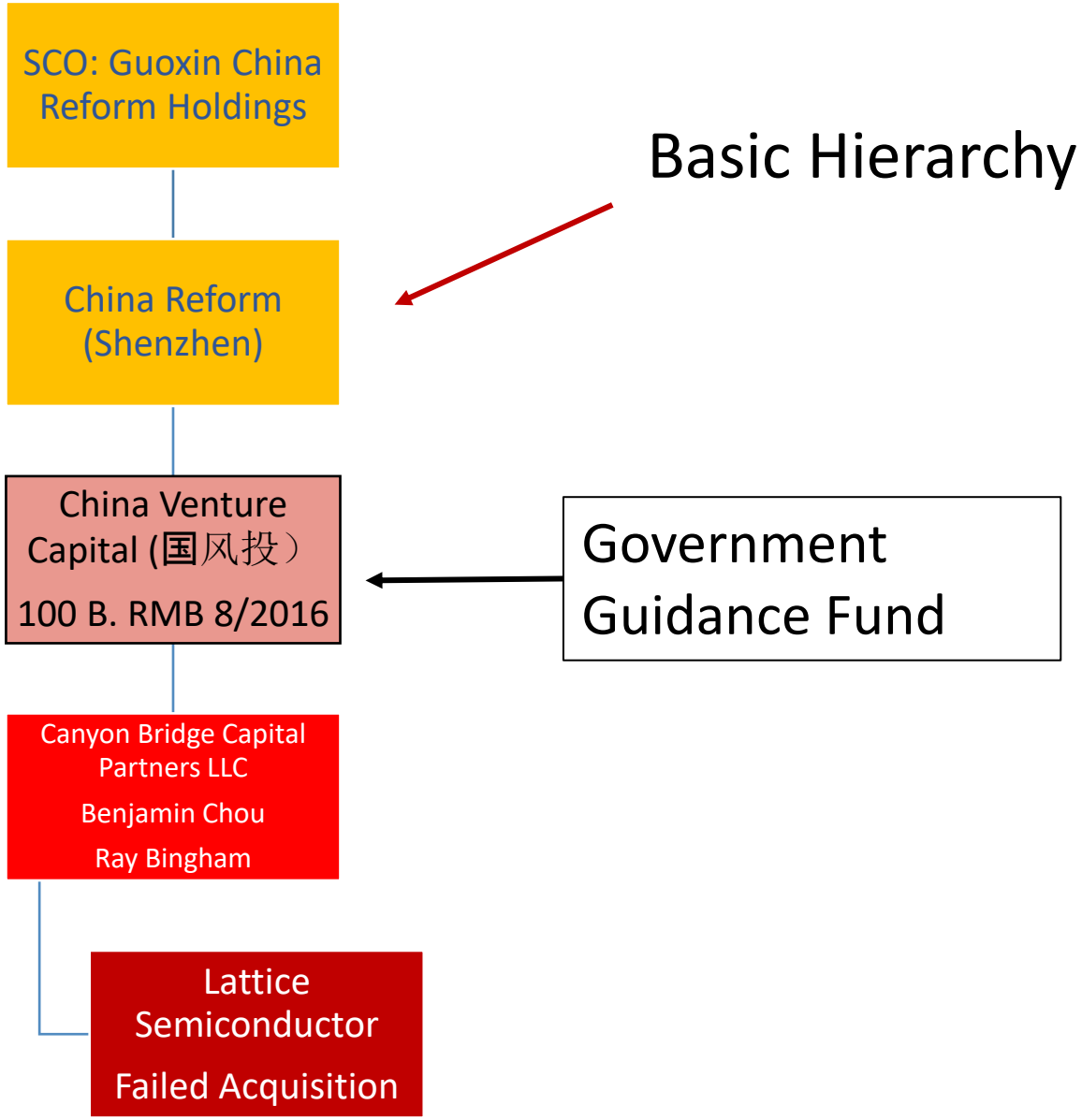
Source: Zero2IPO;
Number of Funds

SCO: China Reform Holdings (Guoxin 国新）

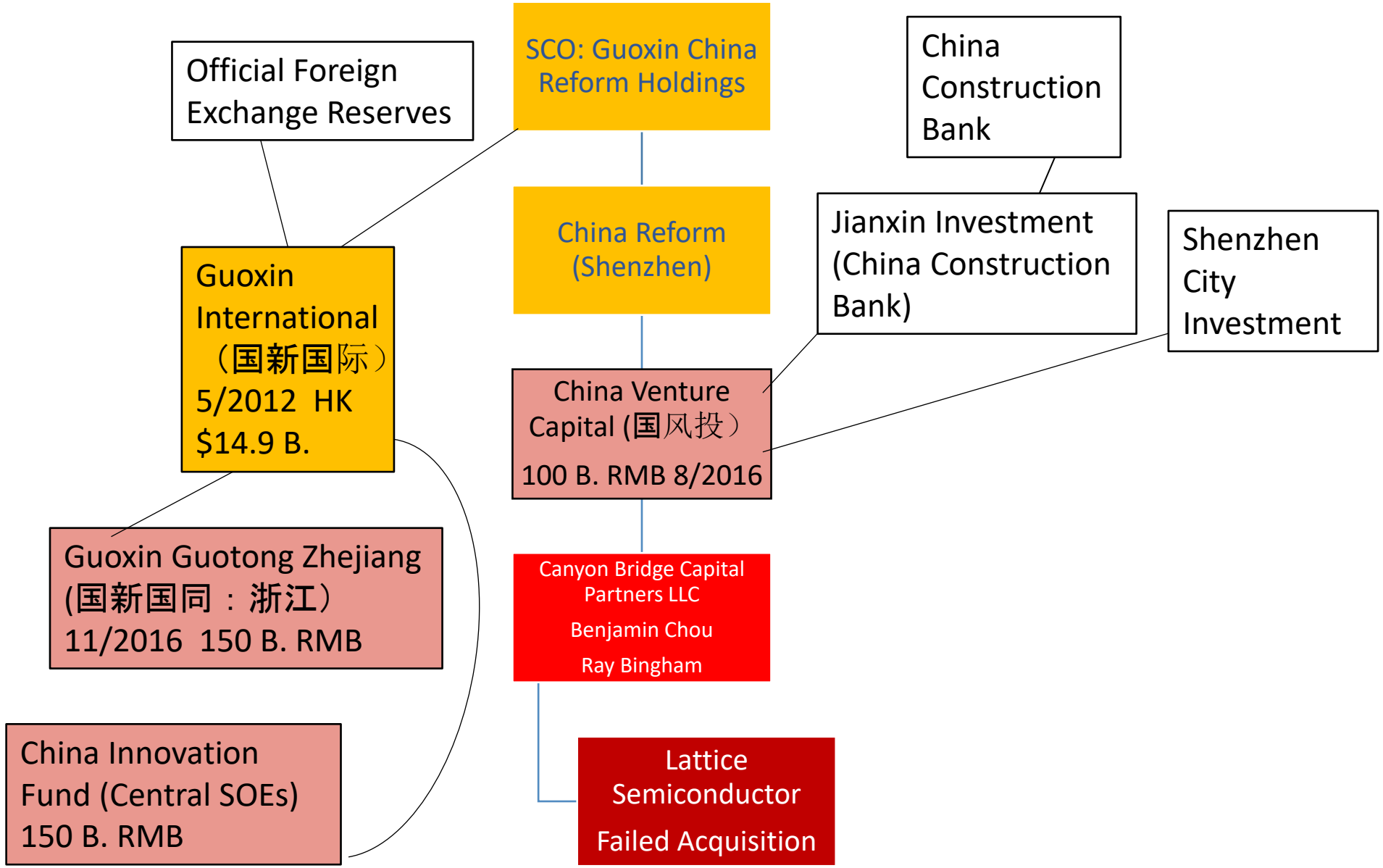
EXAMPLE:

Attempted Acquisition of Lattice Semiconductor by Canyon Bridge Capital.

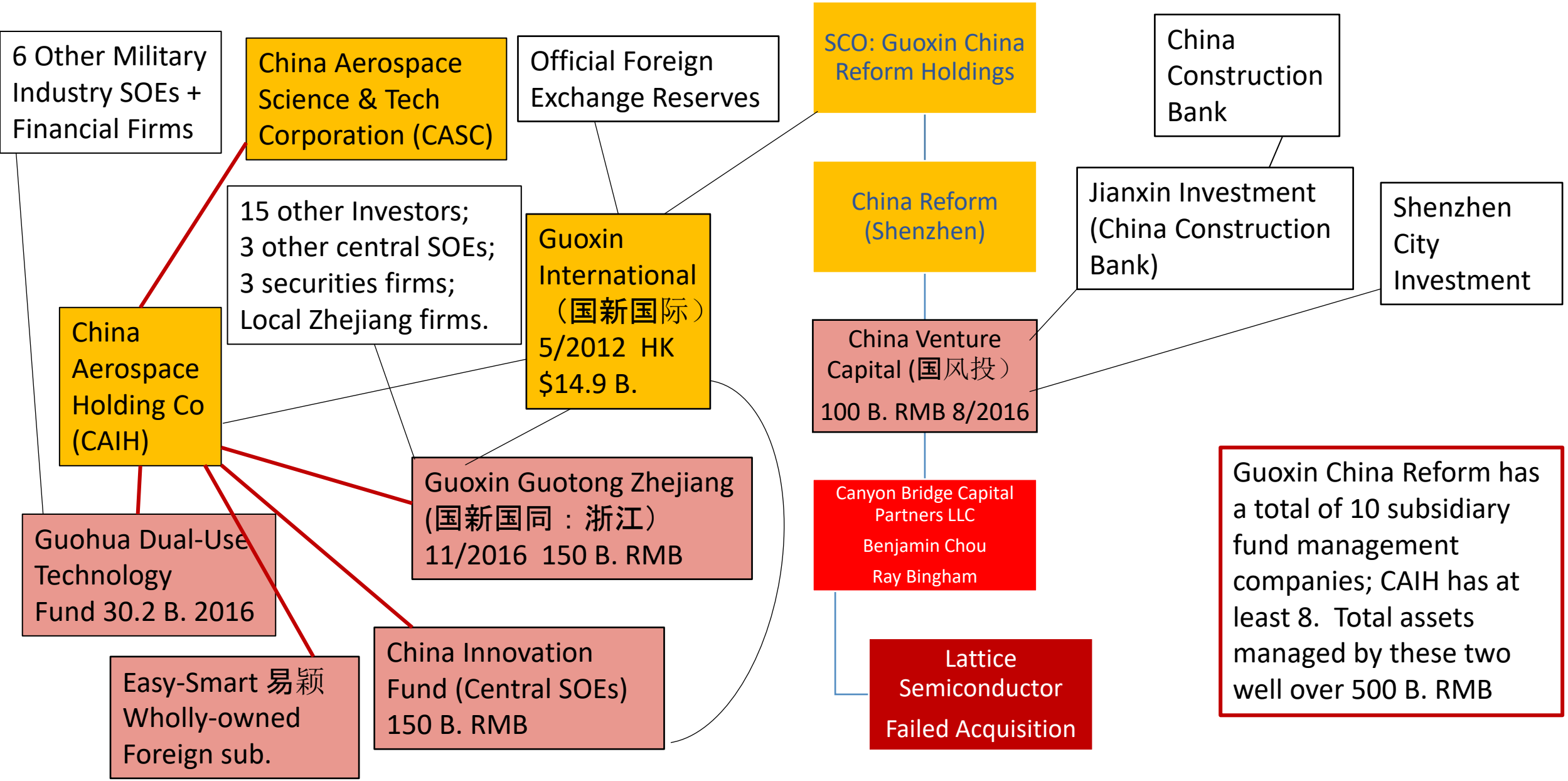
Owned by SCO (State Capital Operations Company), China Reform Holdings (Guoxin 国新), which is one of the 98 apex-level SASAC Companies



SCO: China Reform Holdings (Guoxin 国新）



SCO: China Reform Holdings (Guoxin 国新) + CASC



2b. Emerging Competition for Resources

- So far, increased investment has been justified as a means to keep the growth decline within manageable limits. That is, it is justifiable from a demand-side perspective.
- These initiatives represent a so-far modest step back from market-guidance.
- However, **momentum** for these projects is building steadily. They are new and we have barely begun to see the impact. Within five years, if the current trajectory holds, we will see major changes in the balance between government and market.
- Potential conflicts are evident in fiscal deficit and capital account. In the short run, priority to OBOR is an obstacle in resuming capital account liberalization.

Are these policies “top-down” or “bottom-up”?

- The form of China’s industrial policies are increasingly bottom-up.
- However, this may be an illusion. By pumping an enormous volume of resources into the system, the center actually imposes certain choices on grass roots actors.
- Indeed, top-down policies induce excess entry into promising fields, making the subsequent “shake out” more painful and costly. This is what we saw in the solar panel industry.

2c. Incentive Structure: Absence of an end game.

- The Chinese government is essentially playing the role of a venture capitalist.
- The venture capitalist accepts that 19 of his investments will fail, but that the 1 successful one will generate sufficient profit to offset his losses on the 19. But venture capitalists are rather good at pulling the plug on unsuccessful investments.
- Chinese government takes a long time to recognize setbacks, and keeps investing in failed start-ups for too long a period. We already start to see this in electric vehicles.
- The danger is that many sectors will in the future look like the solar panel industry today.
- Without debt restructuring these issues are especially worrisome.

2d. Technology Risk and Decline of Global Production Networks

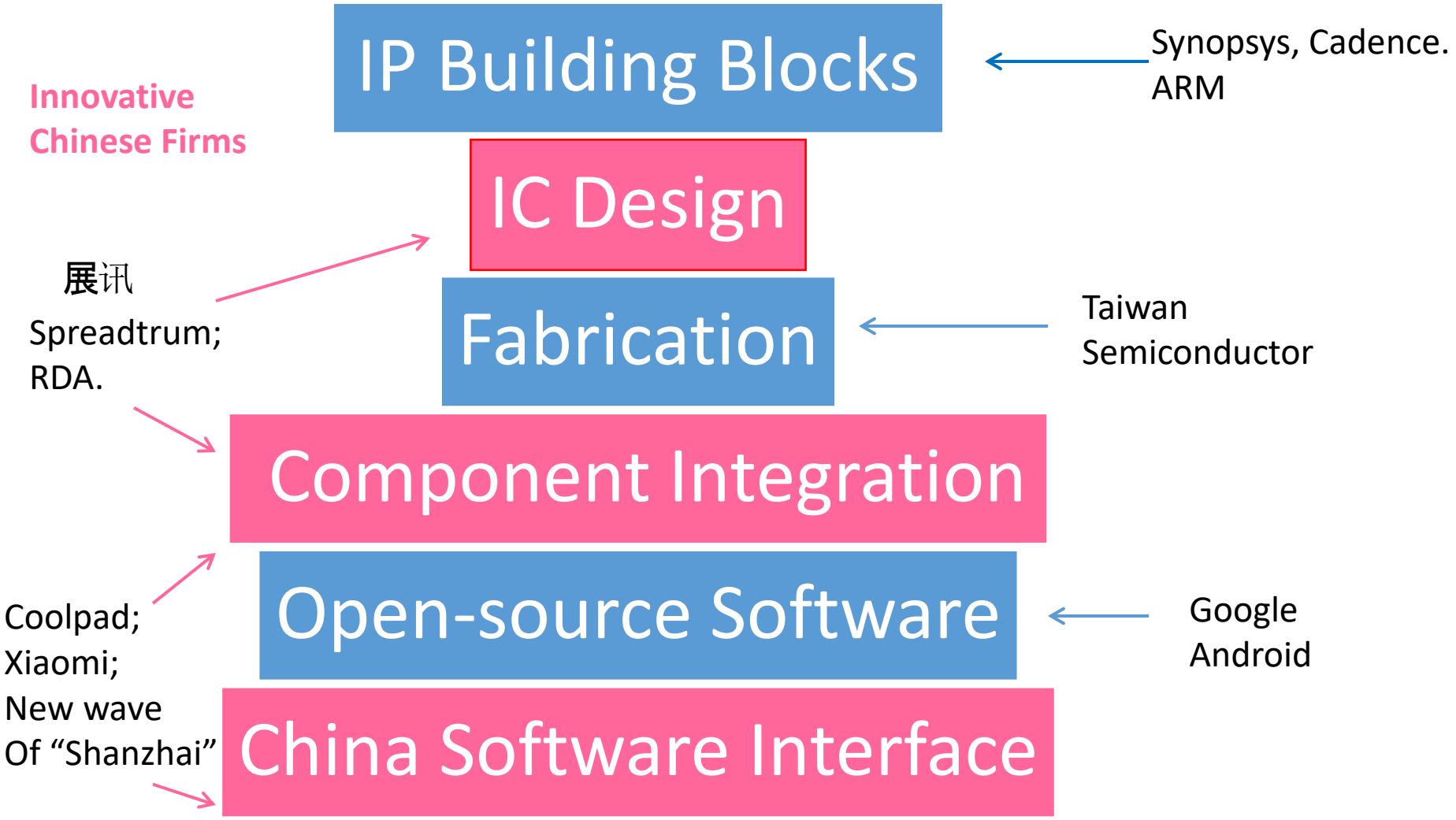
- As China moves closer to the technology frontier, there are fewer opportunities to copy existing technologies, and more risk associated with competing technological paths.
- Especially risky is the Chinese insistence on mastering “core technologies” which are the most difficult and research intensive links in the production chain.
- Past Chinese success has been fundamentally based on close cooperation with multi-national corporations in production chains. Sometimes Chinese participation is “low value-added” but this is due to fast integration and can be gradually changed.

Example: Cell Phones, Global Dis-integration Lowers Entry Barriers for Chinese IC Firms

"The availability of IC design tools, semiconductor fab services, and open-source smartphone software [Android] allows Chinese firms to circumvent their weak spots and develop their strengths in hardware, IC design, and integration."

-Interview, June 2012, with Leo Li, CEO of Spreadtrum (important Chinese telephone handset IC design company, acquired by Tsinghua Unigroup).

Newly Dis-Integrated Value Chain:



Example 2: Electric Vehicles

- China is making a big push into electric vehicles, but this push emphatically includes making the batteries. Chinese industrial policy excludes hybrids; excludes hydrogen fuel cells; doubles down on batteries.
- Technological change in batteries has been disappointment. Tesla is important because it gambled you could succeed with the “old” technology of NiCad batteries, like in your cell phone.
- Now China is going to flood it’s own industry with NiCad batteries. It might work (lowering prices) but if a better technological solution emerges, China will pay a huge cost.

2e. Macroeconomic Problems

- The fundamental context of China's economy today is that profitability in traditional, private-dominated manufacturing is declining.
- By keeping investment high, China essentially insures that productivity will continue to inch lower. With growth of factor inputs reduced, in the long-term growth can only come from productivity improvements. Now all of China's eggs are in one basket: productivity improvement through technology, and not so much from system reform.

Macroeconomic problems emerge gradually:

1. We saw on Monday that productivity growth has slowed. Measured as ICOR (incremental capital-output ratio) or TFP (province-level or enterprise-level specifications) productivity growth has slowed.
2. At the same time, the flow of resources into emerging sectors creates optimism and some remarkable success stories.
3. However, as resources are pumped into lower yielding investments (perhaps because they are premature), the return to investment almost inevitably declines.
4. This contributes to China's debt problems unless handled extremely well. Wrong bets on new technologies could be very costly. China has not yet found an effective way to "de-leverage," reducing debt loads that are already very high.

2f. Increased Possibility of International Conflict

- China's industrial subsidies will compel a response from other developed market economies. This is inevitable and is not dependent on the Trump administration.
- Rules of conduct for international economic affairs are facing an unprecedented challenge.
- Individual high-tech industries will be destabilized in the way that solar panels have been. [Consider the outcomes in solar panels. Who got the benefits? Who paid the costs?]
- U.S. action imminent in: (1) import restrictions on steel and aluminum; (2) increased scrutiny of Chinese investment.

Is “Belt and Road” a beneficial program of infrastructure investment, or a program to dominate neighboring countries?

- It is both.
- Huge potential economic benefits from completing the Asian infrastructure network, which, in a historical accident was interrupted by the collapse of imperialism.
- Neighboring countries have economies that are 1-3% the size of China. They are afraid of being overwhelmed by China economically and politically. (Pakistan is the exception, which is why Belt and Road is moving faster there).
- An alternative Chinese model of global order?

3. Conclusion

- China is the world's most competitive economy, and it is moving upwards fast in a range of sectors.
- Xi Jinping appears highly committed to policies that try to accelerate these processes. The policies may not work, and they are very expensive. They compete with many other priorities for the Chinese people, in particular health care and provision for an aging society.
- They may also lead to increased international friction.
- Xi Jinping's future policy regime will thus depend on the trade-off between these different approaches and objectives.