

# Driving Innovation in China: A Venture Capital Perspective

Gary Rieschel

Qiming Venture Partners

# Context for Today's Discussion

---

## **Economic Drivers: Public Vs Private Enterprise**

- **80% of all employment in Private Enterprises, 107% of all Growth**
- **Direct capital investment was 107% of Growth in 2009; Human Capital grew 16%; Productivity has declined 30%**
- **75% of Industrial Value Add – Private; 75% of which in the last 20 years came from new companies**

**Structural Reform vs Innovation – only choices for China; Painful tradeoffs in Structural Reform (SOE – NPLs)**

**IN/OUT/UP/DOWN – Choices for Chinese Govt/Enterprises**

**Explosion of Venture Capital**

# Definitions

---

**Invention: Unique Product or Technology**

**Innovation: Can be Unique (10% in China) or Adaptive (90%) in China  
Inspiration, Technology Constraints, Brilliant Few**





**Commercialization: Mass Market Adoption  
Scale, Financial/Operating Constraints, Competent Many**

**Clearly Inter-linked: U.S. and China are the only two markets in the  
world with potential to be equally adept at all three  
Capital, Market Need, Talented People**



# Four Sources of Innovation for China

Strong Needs attention Weak

National innovation system					
Innovation patterns	1 Human capital	2 Financial capital	3 Infrastructure	4 Policy & Business environment	5 Local demand
 <b>Science-based</b>	Large pool of R&D personnel but quality can improve; better incentives needed to promote high quality research	Inefficiencies exist in process to allocate public funding for R&D	Quality of life in top Chinese innovation hubs lag global peers (e.g., pollution, education, healthcare)	IP regulations are in place but lack enforcement Limited collaboration among R&D institutions	Moderate domestic demand for high-priced science-based products (e.g. pharma, biotech)
 <b>Engineering-based</b>	Engineering curriculums underemphasize learning-by-doing and "art" of engineering	Inefficiencies exist in process to allocate public funding for R&D	Quality of life in top Chinese innovation hubs lag global peers (e.g., pollution, education, healthcare)	Government intervention in "strategic" industries limits competition and incentives to innovate	Government procurement supports scaling of selected products (e.g., telecom equipment)
 <b>Customer-driven</b>	Gaps in "soft enablers" for entrepreneurship (e.g., creativity, risk-taking, perceived capabilities)	Under-developed capital markets  Debt financing oriented to SOEs	Strong investment in connectivity infrastructure; level of top innovation hubs similar to developed markets	Lack of effective start-up incubators Regulatory whitespace drives commercialization	Large domestic market across product/service categories  Chinese consumers with less brand loyalty
 <b>Efficiency-based</b>	Large population of skilled workers	Significant debt financing available for capex investments for large companies	Strong transportation logistics and utilities in manufacturing hubs	Robust value chain clusters of geographic proximity (e.g., wind, solar)	Government procurement provides "demand" pull for products

SOURCE: Team analysis

McKinsey & Company | 1

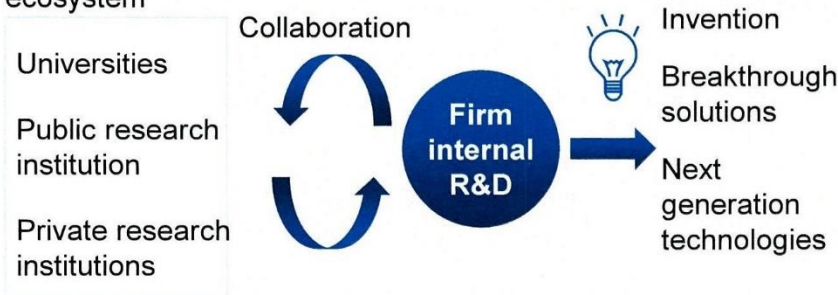


# Four Sources of Innovation for China

## SCIENCE-BASED

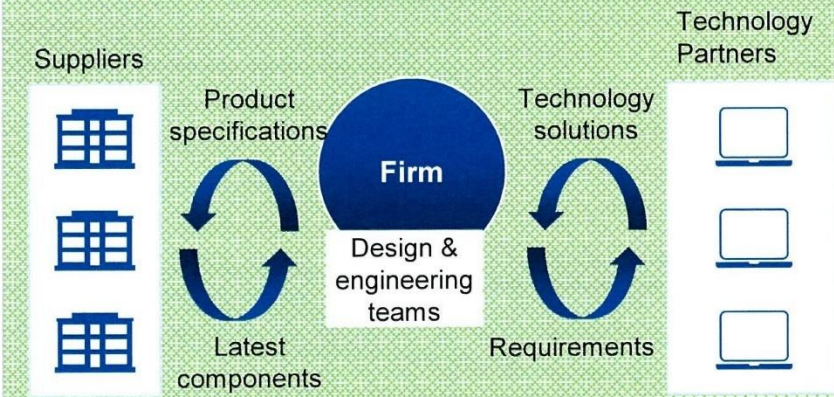
Companies generate solutions and new product/process innovations through basic research

R&D ecosystem



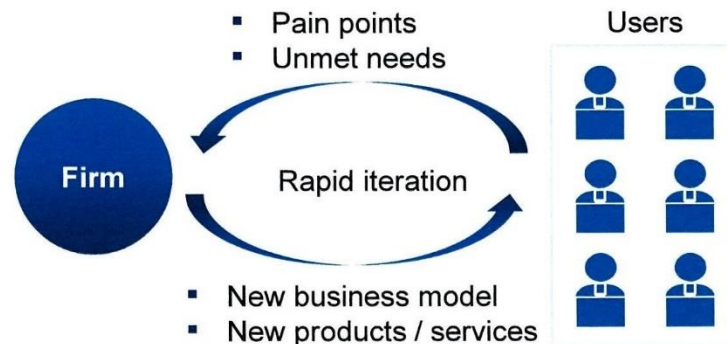
## ENGINEERING-BASED

Innovators develop commercial product by designing platform and integrating technology from network of suppliers



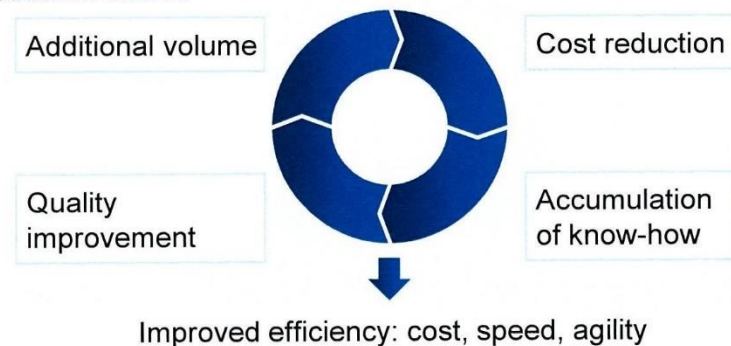
## CUSTOMER-DRIVEN

Innovators develop new products and business models through engaging with users to understand market needs, preferences and underserved segments; crowdsourcing of technology



## EFFICIENCY- FOCUSED

Innovators drive process innovation by maximizing scale economies, lean design approaches, and localization . Technology improvements are sourced from suppliers or internal production teams.



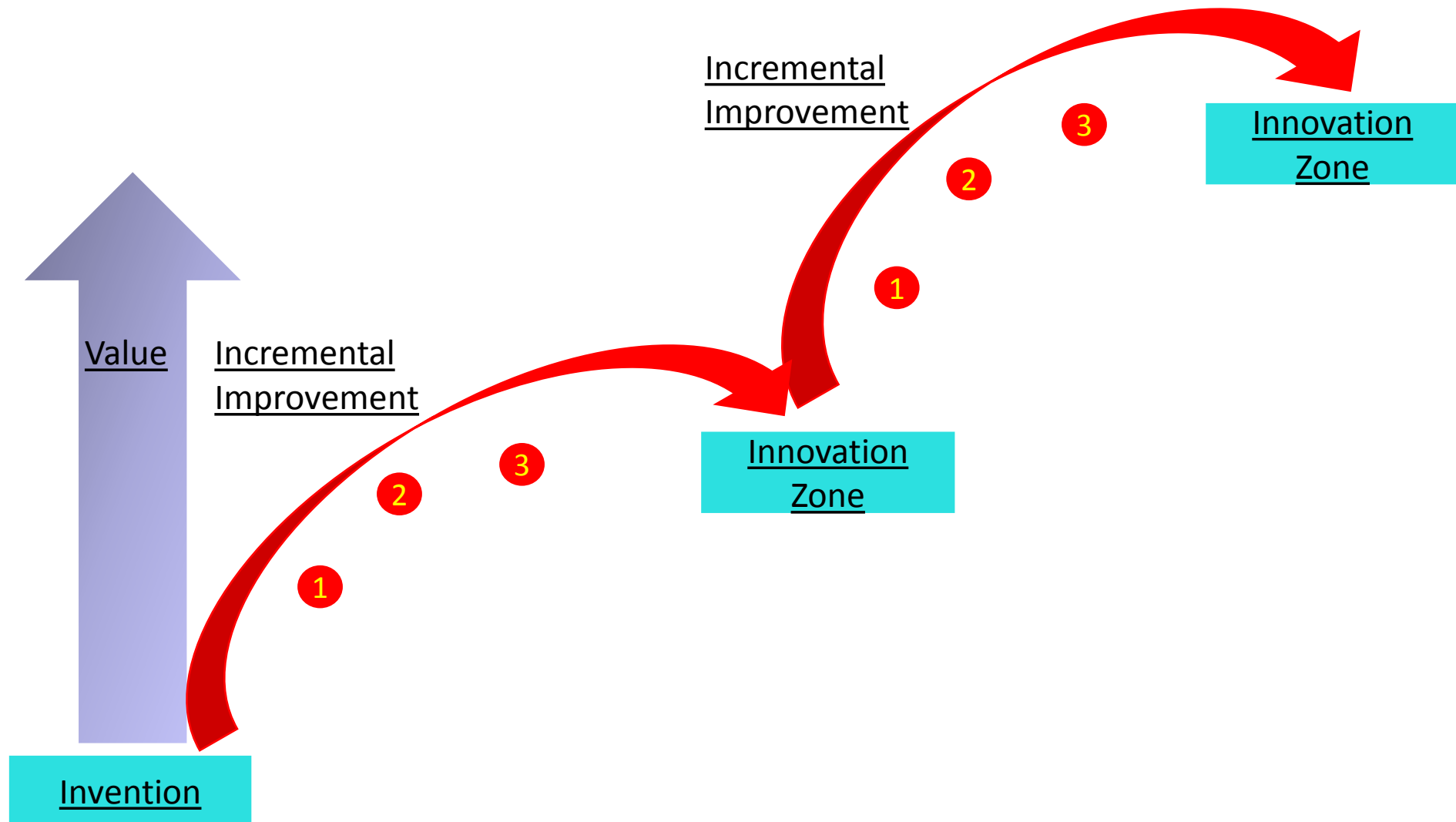
# China's Emerging Innovation Strengths

Potential future innovative areas in China	
Building on existing strength	<ul style="list-style-type: none"><li>▪ Mobile internet (O2O, connectivity-enabled BMs)</li><li>▪ Next Generation Operation (e.g., semi-automated manu, fast supply chain)</li></ul>
Urgency (Must-solve problems for sustainable growth)	<ul style="list-style-type: none"><li>▪ Environmental sustainability (e.g., pollution, water deficit, food scarcity)</li><li>▪ New healthcare delivery models</li><li>▪ Urban complexities management (e.g., space and transportation optimization)</li><li>▪ Education</li></ul>
Areas with "market creation" opportunities (e.g., substantial funding, gov't mandate)	<ul style="list-style-type: none"><li>▪ Biotech/Genomics</li><li>▪ New energy vehicles</li><li>▪ New materials</li><li>▪ Big data/analytics/cloud</li></ul>

SOURCE: McKinsey Global Institute analysis

McKinsey & Company

# China Excels- Speed of Improvement



---

## **Results to Date**

### **Patents by Chinese Firms:**

**US Filings – from 63 (1995) to 8000 in 2015**

**Innovation Patents from 8% to 20%**

**Resource Allocation Issue – SOEs are 1/3 as efficient as Private Companies in Patents/Unit of Investment**

### **Companies Breaking Out in Technical Areas:**

**Huawei – telecom, handsets**

**XiaoMi – consumer electronics**

**Face++, Iflytech – facial, voice recognition**

**NextEV, Faraday Future, Future Mobility, CATL – EV, batteries**

**Royole – now thinnest flexible displays**

**iCarbonX – =genomics**

**Venus MedTech – heart valves**

**UBTech, Pangolin, DJI – robotics, drones**

### **Many examples in Customer-focused Innovation:**

**Mobike, Musical.ly, Apus, MeiTu, Oppo, LePur Yogurt, and so on**



# Invention/Innovation in China Today

---

**5 years at Qiming we have seen increasing number of companies that represent real Invention but still rare; Innovation abundant**

**But does it really matter????**

**What is holding back Invention, Innovation?**

**Too much opportunity in China! Easier to copy or replicate what others are already doing. Proverbial “Low Hanging Fruit”**

**Innovation thus far largely limited to business models and localization, not fundamental technology breakthroughs; Invention emerging**

**But it is a very dangerous game to assume that Innovation won't happen in China**

# Chinese Innovation MegaProjects

---

**Core Electronic Components, CPUs, Software, Large-scale integrated circuit manufacturing, advanced stepper technology**

**Broadband wireless hardware and software, proprietary communication protocols**

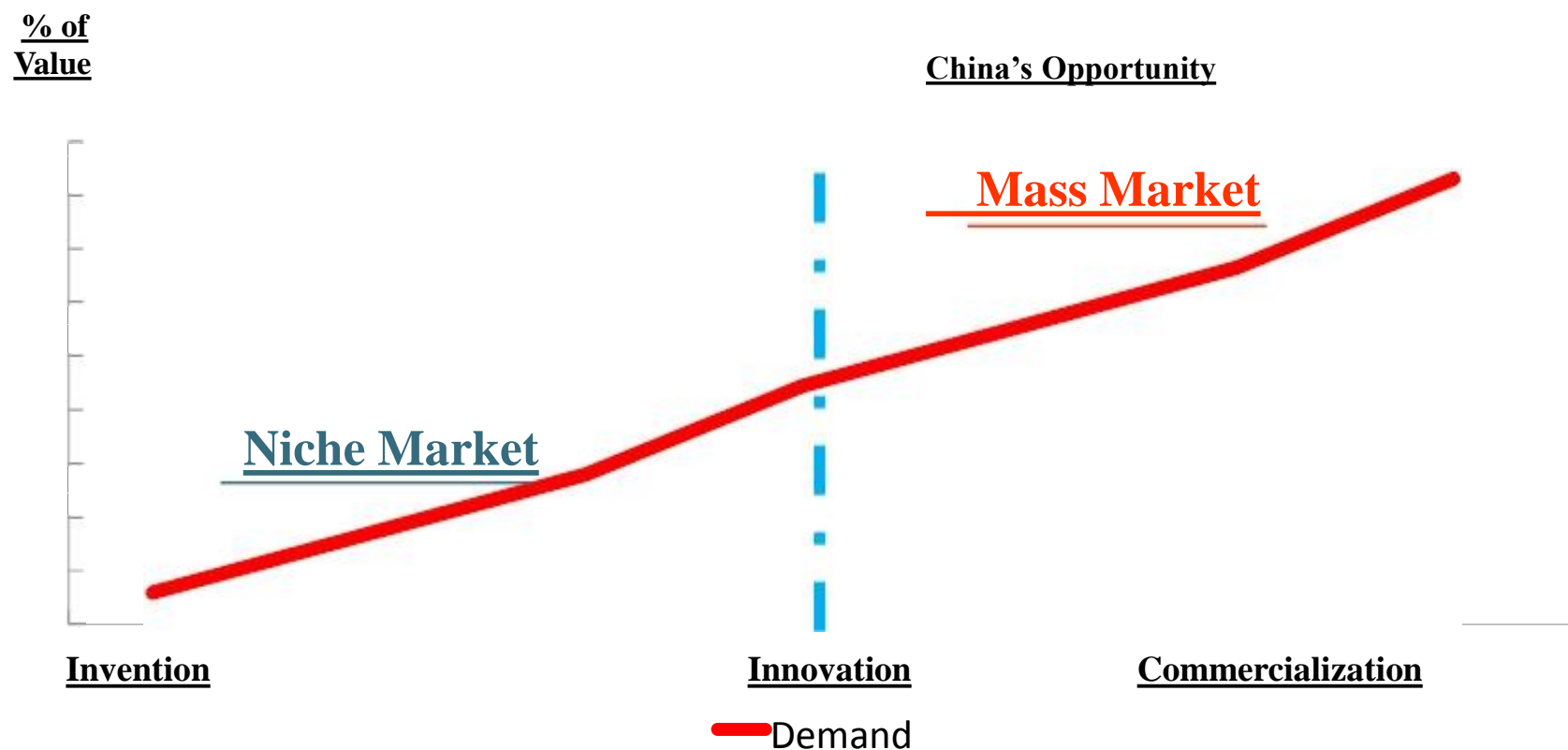
**Robotics, CNC machine tools, Aerospace manufacturing, Advanced nuclear reactor technologies**

**Domestic drug development, Traditional Chinese Medicines, Major chronic diseases (diabetes, AIDS, hepatitis, Genetically Modified Organisms, gene modification technologies**

**Large scale oil and gas exploration, spaceflight, large scale water treatment and desalination**

**Remember – This is not just about competition in US or China – its about competition in the World's Developing Markets**

# China's Innovation Opportunity



# Venture Capital Led Innovation in China



# VC-backed Innovation in China



Venture Capital firms have backed many innovative Chinese companies in the last 15 years

Internet “Localization – the local company wins every time!”

## World Leader

- Ebay
- Yahoo
- Amazon
- Google
  
- Facebook
- EHarmony
- Apple

## Chinese Leader

- Taobao (On line auction)
- Sina (Portal)
- Alibaba (Ecommerce)
- Baidu/Qihoo (Search)
  
- WeChat/Tencent
- Jiayuan (On line matchmaking)
- Huawei, Oppo, XiaoMi (Consumer Electronics)

Unique Chinese Business Model – Unlocking Value in Chinese Market

- Tencent – QQ/SMS, Casual Games
- Focus Media – Outdoor Advertising
- Shanda/Perfect World/NetEase (On Line Gaming)

Internet China now going to ROW – China Leadership to World Leadership? (???)

- Alibaba, Tencent, Baidu, Jingdong, XiaoMi Market caps over \$30B USD; Ali and Tencent over \$150B USD
- 

*The size and growth of China’s domestic market is an extraordinary strategic advantage for China, past and future.*

*VC has grown from \$1B of investment in 2004 in China to \$35B in 2016*

# VC-backed Innovation in China (2)



## Healthcare

### World Leader

- GE/Siemens
- Quintiles
- Medtronic

### Chinese Leader

- Mindray, United Imaging, Alltech (Imaging)
- Tigermed, Crown Bio (Clinical Research)
- Venus, Wego (Medical Devices)

## Telecoms

### World Leader

- Cisco
- Apple
- Qualcomm

### Chinese Leader

- Huawei (Equipment)
- Xiaomi, Oppo (Handsets)
- Spreadtrum (TDSCDMA), Tsinghua

## Cleantech

### World Leader

- Chinese
- Chinese
- Alstom/GE

### Chinese Leader

- Suntech, LDK, JASolar (Solar Equipment)
- Goldwind (Wind Power)
- Shanghai Electric (Large scale turbines)

## Successful Themes Thus Far

- **Localization: Understanding China Better** – Internet companies
- **World Class Product at China Price** – Imaging, Telecoms
- **Truly Unique in China** – On line gaming
- **Critical Mass in China** – SMS, Telecoms

# Ultimate Inhibitor to Invention, Innovation

---

**China is excellent at well defined products and services, but lacks a broad capability for large scale integration of hardware and software**

**It has talented people and state of the art hardware, but has not dealt with key issues in education and research;**

**This is not a “quick fix” – but**

**China Product + Integration + Local Services = Success**

**How to deal with the Trust Deficit**

-

# Q&A

-