From “Made in China” to ”Design in China”

Innovative Capability Development in the Chinese Auto Industry

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Agenda

- Overview of innovative capability in the Chinese auto industry
- Approaches of innovative capability development
- Looking forward

Overview

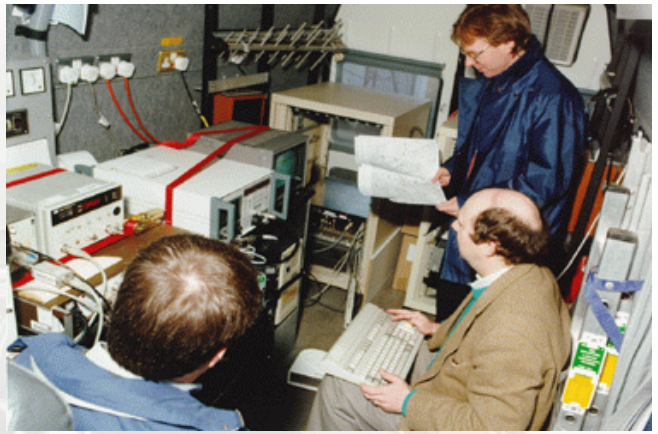
	MNE car makers	Number of auto firms
1. Shanghai Vicinity	VW, GM, Kia, Ford, Fiat	1634
2. Northeast (Changchun)	VW, GM, BMW	291
3. Beijing Vicinity	Daimler-Chrysler, Hyundai, Toyota	333
4. South (Guangzhou)	Honda, Toyota, Nissan	259
5. Central (Wuhan)	PSA, Nissan, Honda	496
6. Southwest (Chongqing)	Suzuki, Ford	487

	Number	Sales	Profit
MNEs	1020	69 B$	6.3 B$
Locals	4837	76 B$	3.3 B$

2004 data

Overview

Multinational brands



- All major global car makers have presence in China
- Take 70% of Chinese car market share
- Most JVs and WOFEs only conduct component innovation in China and keep the architectural innovation at home
  - Architectural innovation changes the overall layout of the vehicle and is the core competencies of auto makers.
  - A natural way to protect multinational firm's core competencies from spillover is keeping architectural innovation at home and only outsource engineering jobs related to component innovation.

Shanghai-VW Santana

Shanghai-GM Sail

Overview

Indigenous bands

- **Passenger cars**
  - Fast emergence and growth in the domestic market. Market share has grow from 18.3% in 2001to 28.6% in 2006, exceeding Japanese brands (25%) and German brands (20%).
  - However, indigenous brands are mainly in the low-end car segment, and have not emerged as direct competitors to the multinational brands, which are mostly in the mid- to high-end car segments.
    - Indigenous brands take 60% domestic market share in the below $13k price range, 5% domestic market share in the $13k ~ $26k price range; and only one brand (Rowe 750) is trying to break into the above $26k price range.
  - Learns to conduct full-scope R&Dbased reverse engineering, including concept design, styl design, and platform layout, which are most important part of innovative capabilities (yet hard to acquired from foreign partners)

- **Trucks and Buses**
  - Have been dominating domestic market (Trucks: 90% market share; Buses: 76% market share)
  - Significant low cost advantage
    - indigenous light duty truck: average $8.3k, multinational brands: average $ 36k
  - Fast increasing of export to the third world countries

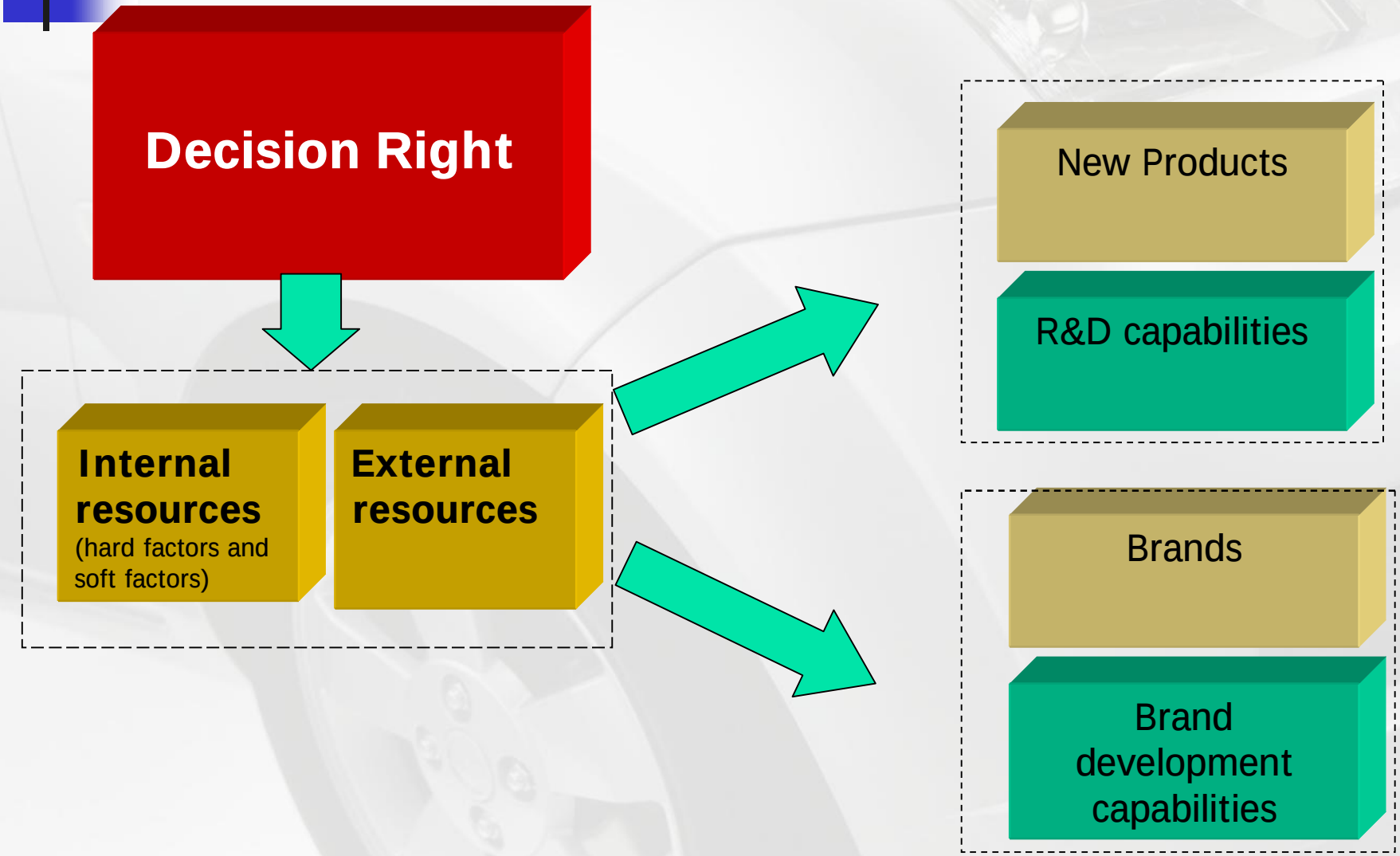
- **Suppliers**
  - Far behind in R&D capabilities.

Overview

Summary

- **Multinational brands are still dominating the most value-adding segments in the Chinese auto industry**
  - Mid- and high-end passenger cars
- **Multinational firms effectively protect their core competencies, i.e. architectural innovative capability, from spillover by keeping the architectural innovation activities at home.**
- **Chinese indigenous car makers have gained initial experiences in full-scope R&D in the low-end car segment, but are still behind in overall innovative capability.**
  - R&D intensity: indigenous car makers: average at 2.3%, whereas multinational car makers average at 5%
  - Patents in China: Honda: 2,807; Toyota: 1124; VW: 223; Chery: 196; Geely: 146; Futon: 85; Hafei: 74 (2005 data)
- **Chinese suppliers have not developed R&D capability in high value-adding components involving electronic controls such as ABS, cruise control, EMS, auto transmission.**

How do Chinese auto firms develop innovative capabilities?



Approach No.1
Learning by Alliance

- **Alliance is the most dominant approach.**
  - The majority of Chinese auto firms have established joint venture with foreign firms as they seek a quick way to acquire technology and make profit.
  - However, since 2004 the alliance approach has been under growing criticism for surrendering the future of the Chinese auto industry to foreign multinational firms.
    - “Market-for-technology joint venture strategy has rob away Chinese firms opportunity to develop full-scope R&D capabilities” (Department of Science and Technology Report, 2004).

- **Benefits**
  - Quick and big profits
  - Low short-term risk
  - Gain important mindset and knowledge such as technical rigor and project management procedures from the foreign

- **Problems**
  - Gave up control right in production planning, supplier selection and design validation.
  - Lost full-scope R&D team and capability
  - Lost indigenous identity and brands

Approach No.2
Learning by Acquisition

- **Examples:**
  - SAIC acquired controlling shares of Ssang Yong Motor (4th car maker in Korea) and acquired shares of Daewoo Motor.
  - SAIC and NAC acquired intellectual property rights of one of Rover's car platform and engine technology. SAIC acquired MG-Rover's R&D team and formed a overseas R&D center based on that.
- **Benefits**
  - Retain rights over the knowledge acquired and new product development decisions.
  - Quick way to gain platform technology (not architectural innovative capability), R&D personnel and brand
- **Problems**
  - Difficulty of integrating the acquired resources and capabilities due to cultural clash and the lack of absorptive capacity
  - Lack of opportunity to assimilate the architectural innovative capability embedded in the vehicle platforms inherited from the target firm.

Approach No.3
Learning by Outsourcing R&D

- **Examples**
  - Hafei's Lobo: exterior was designed by the Italian design firm Pininfarina. Lobo's power train was designed by the British design firm Lotus. Its testing was outsourced to the British engineering firm MIRA. Hafei sent many engineers to these firms to learn by working with the foreign engineers.

- **Benefits**
  - Keep the decision right and property right.
  - Have better opportunity to learn and assimilate architectural innovative capabilities.
  - Develop indigenous brand.
  - Enjoy "brand spillover" from the related firms.

- **Problems**
  - Very costly and risky in the short term.
  - Have to send engineers to work on the site of the R&D service providers. This may be hard to impose.

Looking forward
Opportunities

- **Global and local pressure for "Design in China"**
  - Need for design localization – low cost, better fit to the market, road condition and regulatio
  - Need for launching new models
  - Advantage of using low-cost and well-educated Chinese engineers
  - E.g. Delphi, Bosch, and Valeo are investing 50+m$ each set up R&D centers in China.
- **Chinese government priority**
  - Developing indigenous R&D capability has become the number one national economic priorit
  - Chinese government has loosen up its control over new product development.
- **Market demand**
  - Domestic market has reached an important critical mass for scale economy of indigenous ca makers to justify their R&D spending.
  - Chinese consumers like new car models.
- **Supplier base and clusters have emerged.**
- **Late-comer advantage**
  - Acquire time-tested knowledge without initial investment.
  - Alternative fuel and electronic control technologies may reset the technological clock
- **Growth Potential**
  - There may be 15 years of substantial growth to come

Looking forward
Challenges

- **Lack of scale**
  - Most car makers are not producing at economic scale. 121 out of 128 car brands produce less than 0.1 million per year.
  - Too many players in each segment and yet new entrants are still entering.
- **Shrinking profit space**
  - Price war caused by over capacity
  - Rising cost of materials and labor
- **Fast changing and unpredictable market**
- **Extremely hard to establish indigenous brands in high-end segments**

Looking forward
Projections

- **Consolidation**
  - Industry policy advocates consolidation. SAIC and NAC are talking of merger.
  - MNEs are the potential force to unify the fragmented competitive landscape. E.g., VW has been consolidating production planning and purchasing process between its two JVs in China. VW also plans to build up a green field supplier base in China.
- **Further growth of the indigenous brands**
  - Extending the low-cost advantage
  - Breaking into the higher-end segment ?
  - Leapfrogging in alternative fuel and electric cars ?
- **New strategies of multinational brands**
  - Learn to achieve lower cost from the Chinese firms
  - Compete with indigenous firms on the lower end segments
  - Transfer architectural capability to China for better and faster market adaptation. (e.g. Guangzhou Honda and Shanghai GM)