

INNOVATION WITHOUT NOVELTY: THE STRUCTURAL AND INSTITUTIONAL ROOTS OF CHINA'S INNOVATION PATTERNS IN MOBILE PHONE HANDSET INDUSTRY'S

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RESEARCH BACKGROUND

A pilot study of a five-year project of US NSF

The project: construct innovation theories for emerging economies

This research:

- understand innovation behavior of Chinese firms
- limit inquiry to institutional and structural perspective
- focus on non-state handset firms

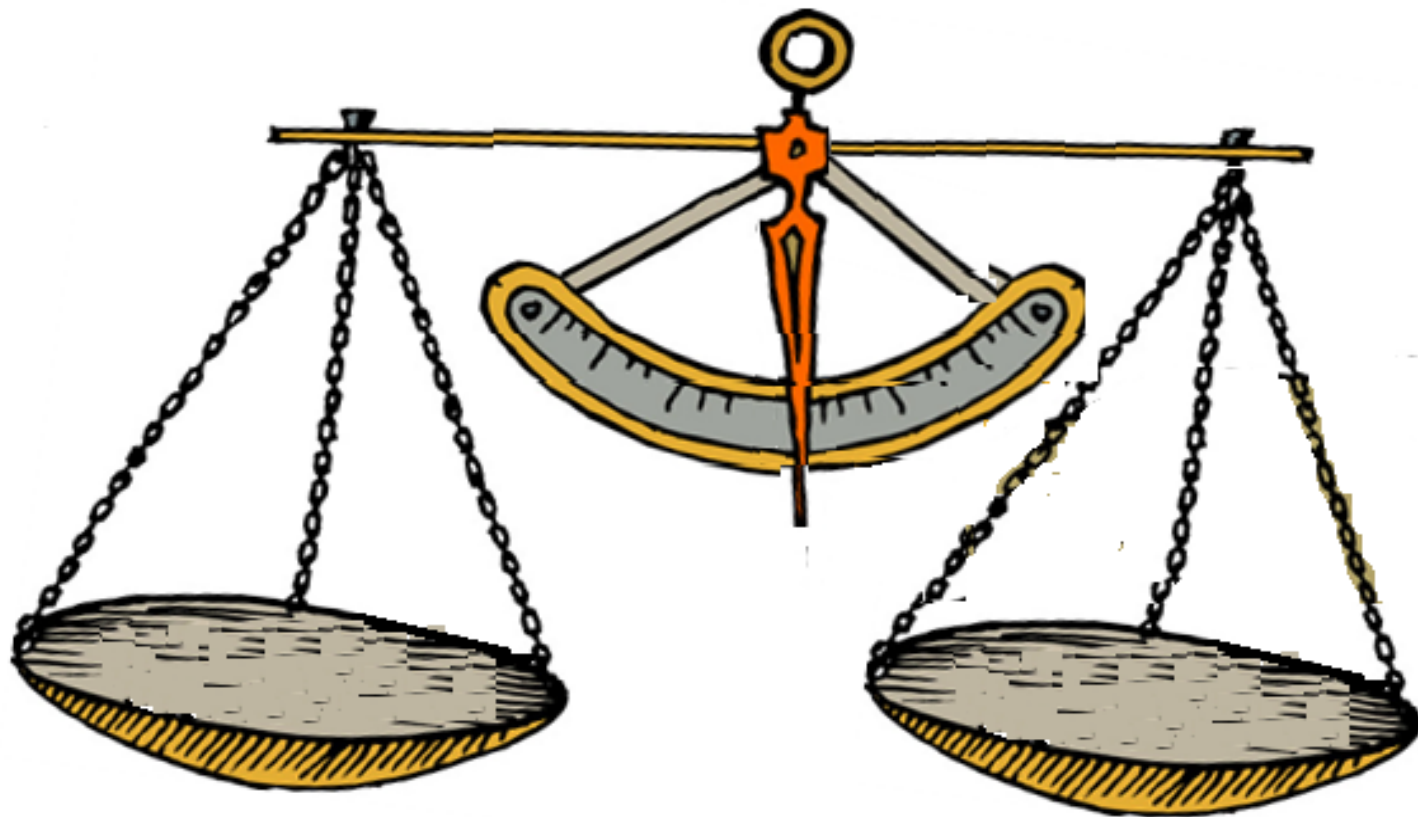
CENTRAL PLANNING

National strategy of indigenous innovation

- Rooted desire of self-sufficiency
- Failure of trading market for advanced technologies
- Perception of national security and economic threat

MLP: Innovative society by 2020

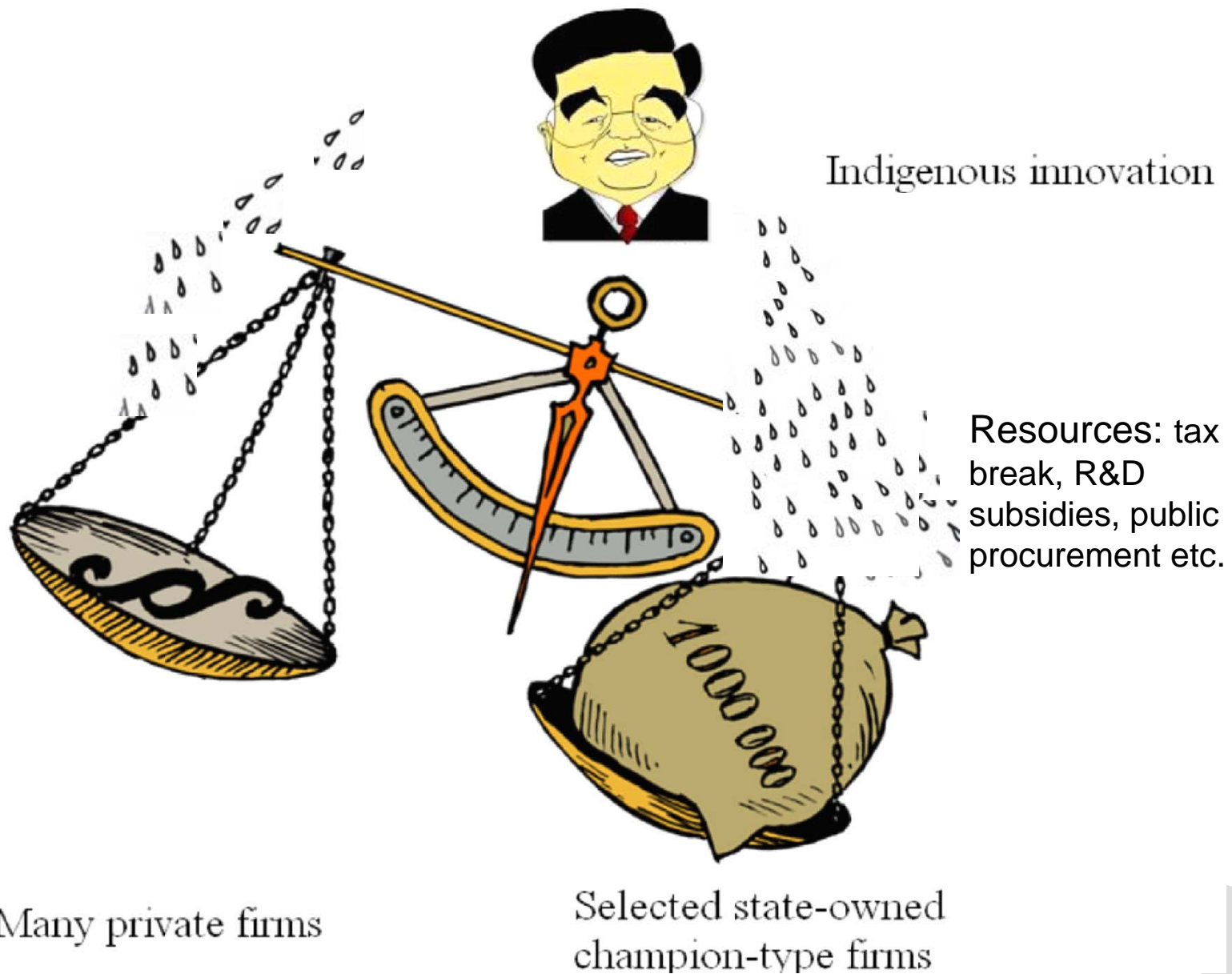
- R&D investment $> 2.5\%$ of the GDP
- S&T contributing to $\geq 60\%$ of total EG
- Dependence on foreign technologies $< 30\%$ (41% in 2008)



Many private firms

Selected state-owned champion-type firms

Source: Pictures were adapted from those at www.nipic.com/bc20



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PUZZLE

Expectation

- Novel product innovation by state selected firms (LMEs)

Reality

- A profusion of private firms pursuing incremental or a hybrid of imitation and innovation practice

A SYSTEM ARRAY AGAINST CHINA SMEs

- Fierce competition against domestic brands and international brands
- Constraints associated with small size
 - Innovation certainty ↑
- Negligible support from the State
- Uncertain environment

RESEARCH QUESTIONS

- **How** do they survive and thrive under a system array against them?
- **Why** do Chinese private firms pursue incremental innovation or copy-innovation practices?
- **What** are the characteristics, if any, of innovation behavior among them?

RESEARCH SETTING

-CHINA'S HANDSET INDUSTRY

- Important
 - The **largest production center** for handsets
 - 1130 m cell phones; 70.6% global share (2011)
 - 62.8 b USD worth export
 - The **fastest growing markets** for mobile phones
 - 1,085 m subscribers by Sept. 2012
 - penetration rate of 81/100 habitants
 - A **strategic industry** selected by the state
- Phenomenal
 - **Swarms of non-state firms pursue** incremental innovation

Data source: MIIT Bulletin

LITERATURE GAP: EMPIRICAL STUDIES

Surging of studies on China mobile handset industry

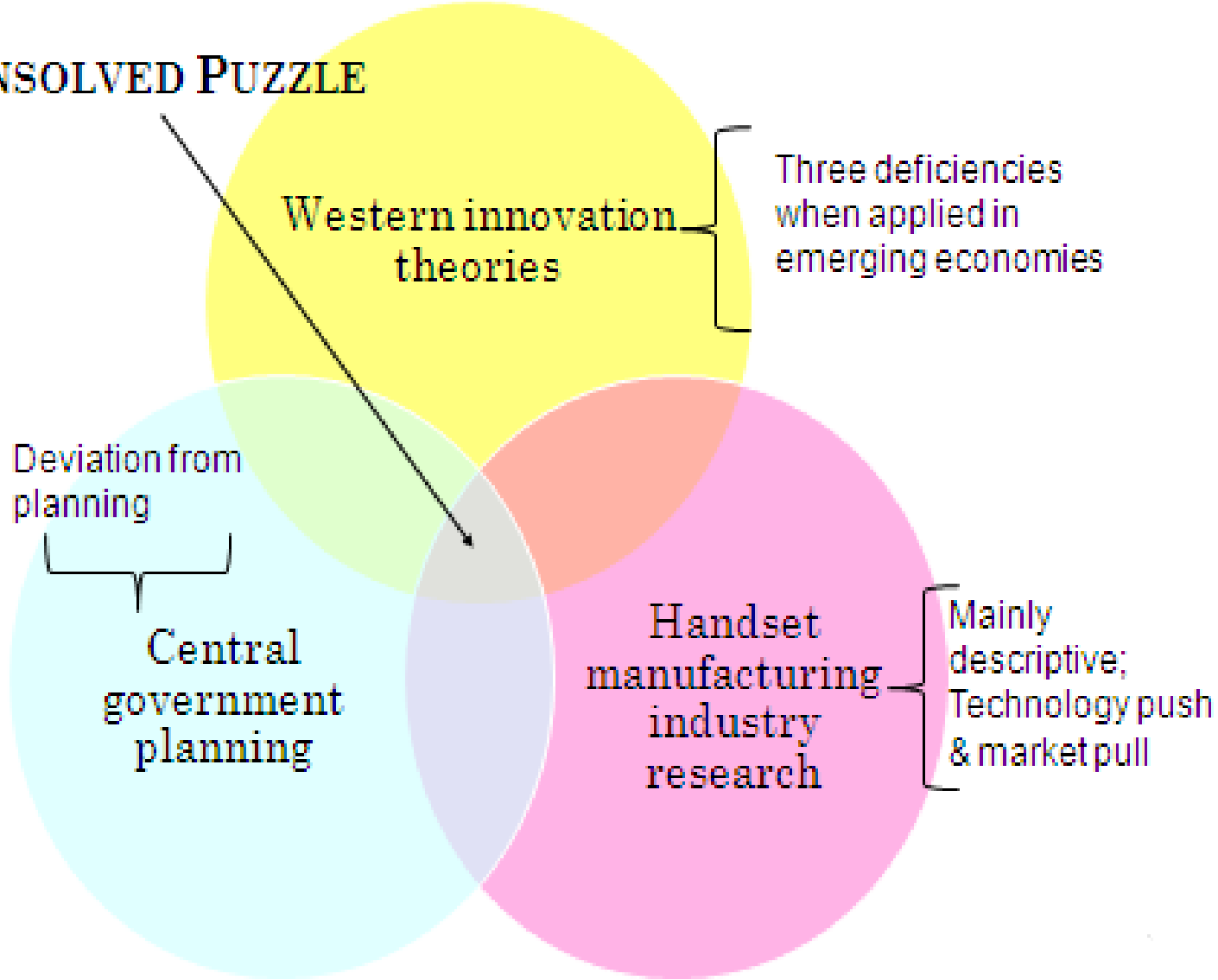
But,

- Mainly descriptive
- Technology push and market pull (Kao and Lee, 2010; Sun et al. 2010; Yu 2005; Zhu et al. 2009; An et al., 1006)

LITERATURE GAP: THEORIES

- Much take institutions and incentives in western economies as givens
 - rule of law
 - effective IPR
 - financing infrastructure,
 - credible stable commitment of government
- Some emphasize the role of state in national innovation development (eg. Amsden 1989; Gerschenkron 1962)
- Failed to consider the increasing fragmentation of global production & the rise of EE

UNSOLVED PUZZLE



RESEARCH METHOD

- **Case Study**

- Based on field work and interviews
- Convenient sample and snowball method
 - fierce competition
 - quasi-grey zone

- **Data**

- Primary and secondary documentary data
 - in-depth interviews
 - direct observations

KEY NOTIONS & PROPOSITIONS

Fragmentation of global production

- Spatial dispersion of component production and integration across national borders
 - Modularization production in IT sector
 - firms can focus their resources on core capabilities
 - Eg. MediaTek chipset (one-stop turn-key solution)
 - low technology threshold for firm entry

PROPOSITIONS 1

- *With the fragmentation of global production, China's non-state firms in the mobile phone handset industry confine their innovation to a specific stage of production.*
- ✓ Mobile handset manufacturers are granted opportunities to develop unique and strong competitive capacities
- ✓ Have to innovate around the core in their own ways

KEY NOTIONS & PROPOSITIONS (CONT')

Structured Uncertainty

- Definition: An institutional condition that cements multiplicity of action without legitimizing a specific course or form of behavior as the proper one.
- Chinese firms face:
 - Innovation uncertainties
 - Structured uncertainty

Eg.

- Different or conflicting of views state elites on goals (3G)
- Locality deviation (under the flag of autonomy)
- Industrial regulations (production license & testing)

PROPOSITION 2

*Constrained by structured uncertainty,
China's non-state firms opt to seek
competitive position by excelling in
incremental innovation.*

Multi-layer space-time-varying ambiguity
=>unable and unwilling to bear the risks of
radical innovation
=> Rational behavior: incremental innovation

PROPOSITION 3

The tacit alliance between firms and local officials buffers structured uncertainty, while encouraging incremental innovation.

- Firms' willingness
 - business partners (with suppliers and buyers)
 - government allies (for resources and support)
 - eg. obtaining permits, avoiding fines, getting R&D subsidies, mitigating risks
- Local bureaucrats' inclination
 - increased fiscal incentives
 - expanded local autonomy
 - unitary personnel evaluation and promotion systems

TABLE 1: SUMMARY OF INTERVIEWS

Type	Interviewed time	Location
7+(5) Handset firms	2011 summer; continuing	7+(3) in Shenzhen, (1) in Zhuhai, (1) in Beijing
5 Innovation scholars	2011 summer	2 Beijing, 1 Shenzhen, 2 Shanghai
5 Government officials	2011 summer	1Beijing, 4 Shenzhen Longgang Districts
3 Mobile Phone Markets in Shenzhen	2011 summer	Mingtong, Gaokede, & Longsheng
3~7 Mobile software design firms	Scheduling	Shanghai

PRELIMINARY FINDINGS

Proposition 1 is supported (fragmentation of global production)

- Every component of making a handset can be purchased within 5km radius of Huaqiang Bei.
- “Traditional Chinese medicine” (quote)

Proposition 2 is supported (excelling in incremental innovation)

- fast dump incrementally innovative products to market
(capital paucity; technology forecasting uncertainty)
- tailor incremental innovation to customer needs
(long tail market)

PRELIMINARY FINDINGS (CONT.)

Proposition 3 is supported (certainty of local protection)

- **Explicit support** from local government
 - Various resources and tax breaks on R&D activities
- **Tacit alliance**
 - Cooperative attitude of firms introduced by officials
 - Sympathy toward private handset firms (even Shanzhai)
 - Be instrumental for firms' international market expansion at the cost of declining tax revenues
 - Aggregation of mobile handset firms contributes hugely to local development (~200,000 employment; ~40 billion RMB in annual sales in 1009)

DISCUSSION

Limitations

- Convenience sample

Implications

- Indigenous innovation is not a panacea
- Double –edged sword

Next steps

- Future visits
- Expanded research scope