

Measuring Innovation in Catching-up Economies: A Thai Experience

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Rationale



- ⌘ To illustrate the state of innovation of firms in developing countries using Thailand, a less successful country in catching up, as a case study.
- ⌘ To draw some implications on innovation surveys in developing countries.

Outline of Presentation



- ⌘ **Initiatives in Applying Community Innovation Surveys to Catching-up Economies.**
- ⌘ **Innovative Capabilities and Competitiveness of Firms in Thailand: An Analysis from Innovation Surveys**
- ⌘ **Conclusion**



**⌘ Initiatives in Applying
Community Innovation Surveys to
Catching-up Economies.**

Past and Existing Initiatives (1)

- ⌘ Several initiatives to improve the surveys to be more suitable for catching up economies
- ⌘ RICYT (Latin America): Bogotá Manual and Annex of Oslo Manual (2005) emphasis 4 characters of innovation process in developing countries
 - ☒ *Acquisition of embodied technology* (equipment) is a major component of innovation.
 - ☒ *Minor or incremental changes* can be the most frequent type of innovation
 - ☒ *Organizational change* is extremely significant in the innovation process to absorb new embodied technologies
 - ☒ Innovations in the *agricultural sector* have high economic impact due to its overall significance

Past and Existing Initiatives (2)

- ⌘ **ECLAC (Latin America): an effort to articulate some institutions responsible for the design, data collection and treatment of innovation surveys**
- ⌘ **UNU-MERIT (Africa): innovation surveys for African countries**
- ⌘ **No major initiatives in Asia**



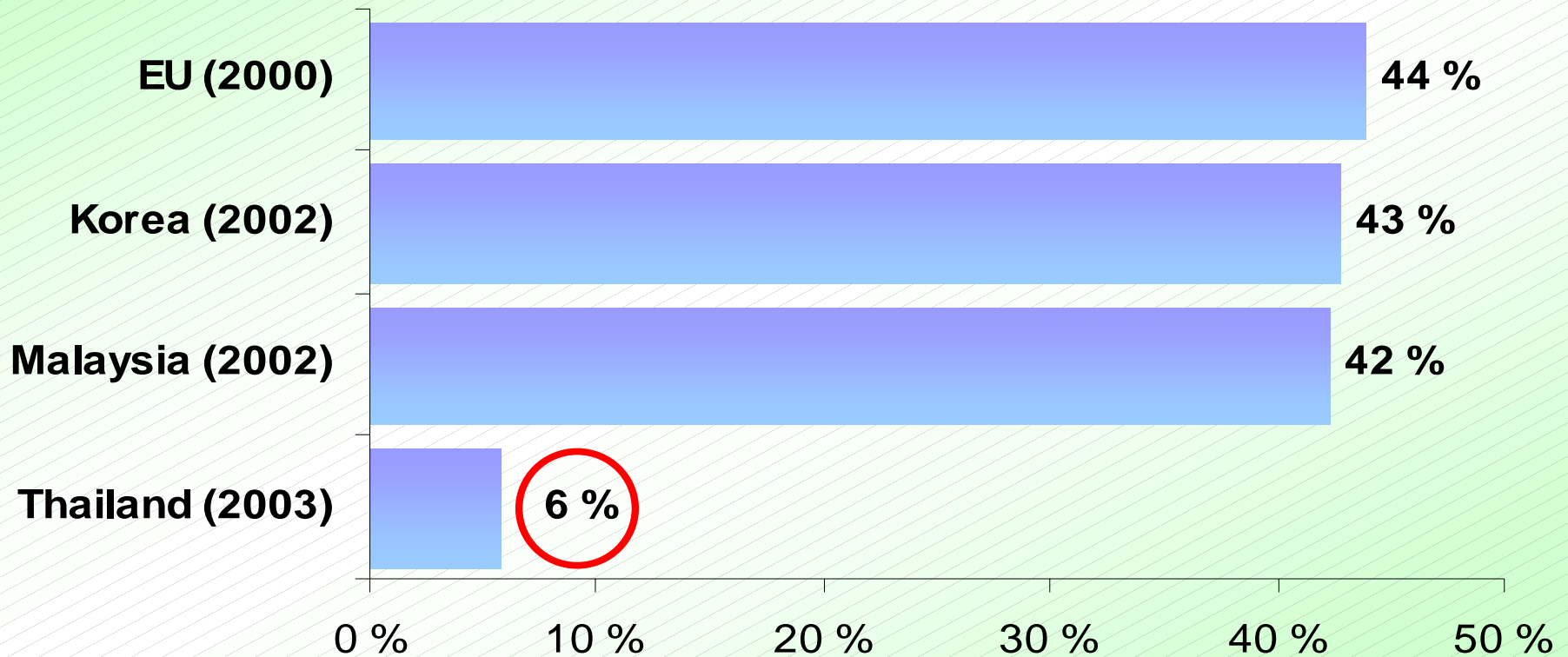
**⌘ Innovative Capabilities and
Competitiveness of Firms in
Thailand: An Analysis from National
and Regional Innovation Surveys**

Thailand's National Innovation Surveys

	1999	2001	2003
Size of population	13,450	41,032	21,653
Size of sample	2,166	6,082	6,031
Response rate (%)	47.0%	36.9%	42.8%
R&D performing firms (%)	12.7%	1.7%	6.0%
Innovating firms (%)	12.9%	2.6%	5.8%

Thailand in International Perspective

% of technological innovating firms



Most Large TNC Subsidiaries

Many Large Local Firms

Some SMEs

RESEARCH AND TECHNOLOGY DEVELOPMENT

Occasionally Present, but scale usually limited. Depleted by crisis in some cases. Strengthened by pressures in many

DESIGN AND ENGINEERING

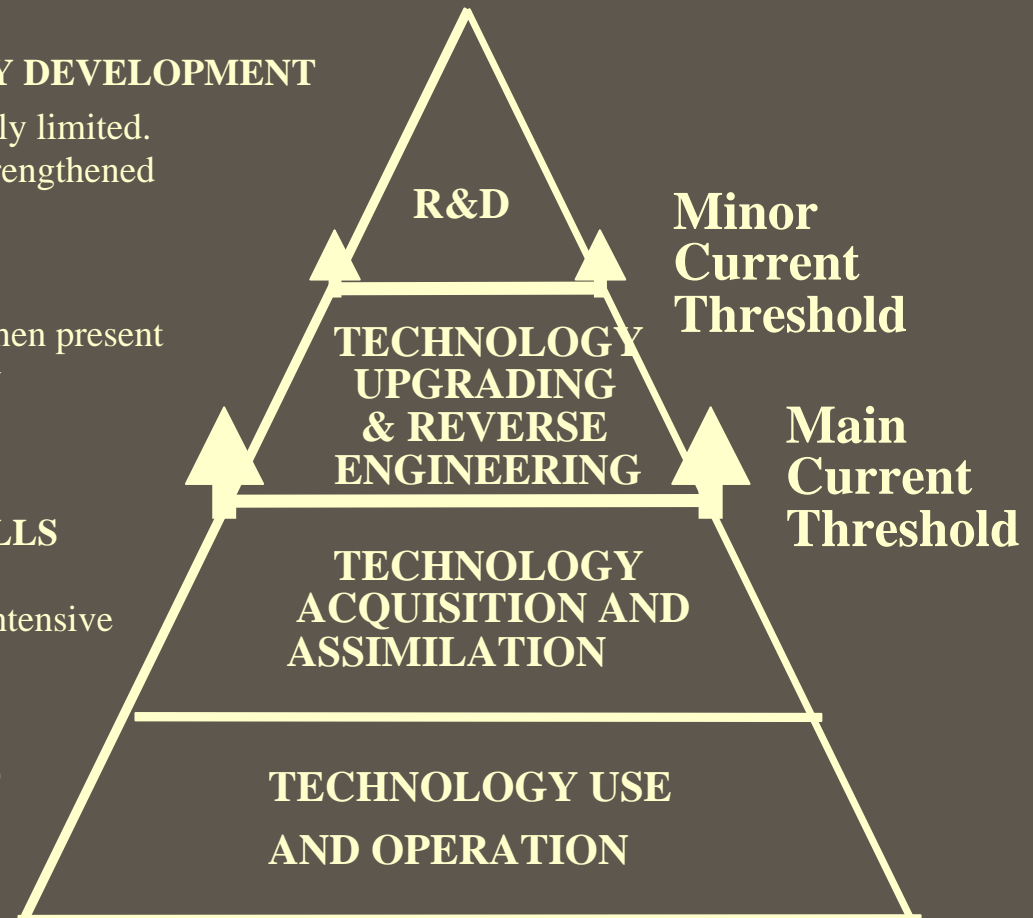
Capabilities limited, but growing. When present they often play a limited technology development role, but that probably changing

TECHNICIAN AND CRAFT SKILLS AND CAPABILITIES

Usually present, often the focus for intensive training efforts. Selected key skills sometimes weak

BASIC OPERATING SKILLS AND CAPABILITIES

Present, often strong and regularly upgraded



×××××
Most SMEs
×××××

RESEARCH AND TECHNOLOGY DEVELOPMENT

Very Rarely Present

DESIGN AND ENGINEERING

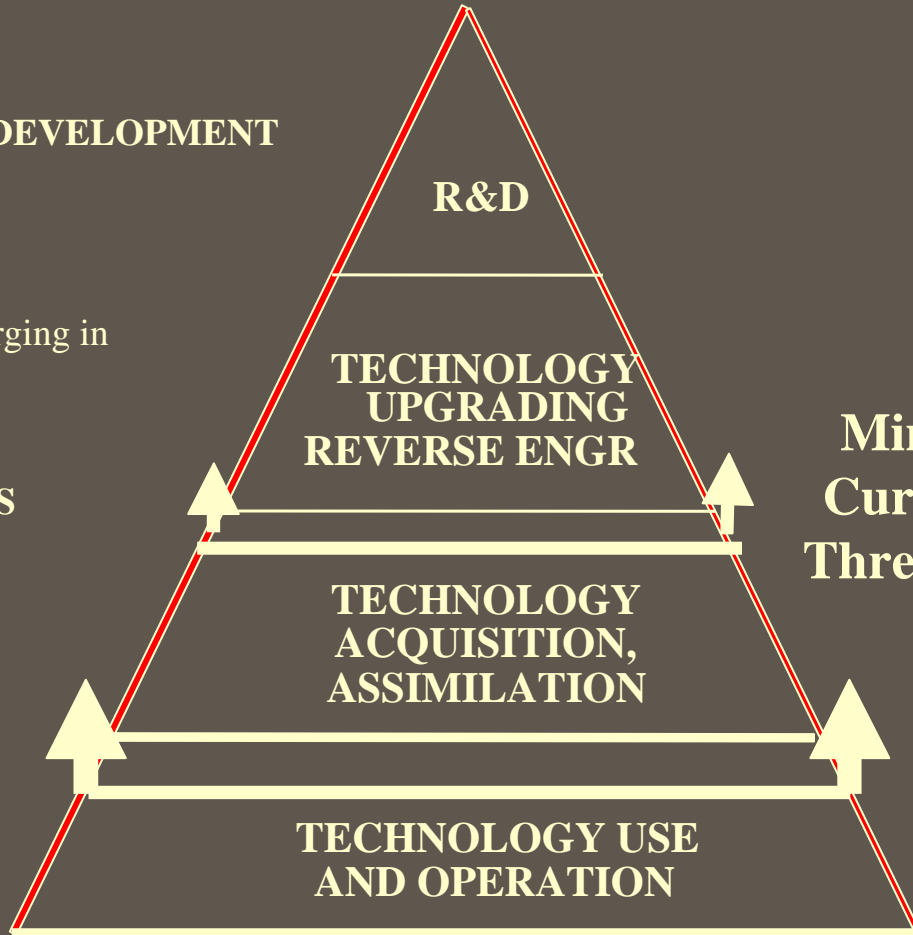
Capabilities rarely present, though emerging in some firms

TECHNICIAN AND CRAFT SKILLS AND CAPABILITIES

Strong skills sometimes present, though key skills often absent or weak

BASIC OPERATING SKILLS AND CAPABILITIES

Often weak, with limited and Irregular upgrading



**Minor
Current
Threshold**

**Main
Current
Threshold**

Lower Proportion of Innovating Companies and Focus in Process Innovation

Share of innovating companies

	Thailand	Korea
Innovating	6%	42.8%
Product and process innovation	2.9%	21.0%
Only product innovation	4.1%	17.0%
Only process innovation	4.3%	4.0%

Lower Proportion of Innovating Firms both for SMEs and Large Firms

Share of innovating companies in respect to firm size

	Thailand	Korea
SME *	7.3%	41.0%
Large Company	14.4%	78.0%

* The definition of SMEs is different in Korea and Thailand.

In Korea companies with less than 300 employees are defined as SMEs,
while in Thailand companies with less than 200 employees are defined as SMEs.

Because these categories relate to the general structure of the economy, no levelling has been applied.

Lower Proportions of Innovating Firms Regardless of Ownership

Share of innovating companies in respect to ownership

Thailand

Partly owned by TNC 12.2%

100% Thai ownership 10.2%

Korea

Affiliates of foreign firm 52.0%

Affiliates of Korean firm 59.0%

Independent firm 42.0%

Difference is particular large in Science-based Sectors

Share of innovating companies in respect to sectors

Thailand

Korea

Textiles 7%

Textiles 20%

Food 18%

Food 40%

Chemicals 11%

Chemicals 54%

Objectives of Innovation suggest different stage in industry life cycle

: New Product Development VS Mature

	Thailand	Korea
Reduce production cost	77.4	75.8
Improve production flexibility	69.0	64.3
Increase market share	69.2	83.4
Replace products being phased out	56.9	80.5

Percentage of Expenditure on Innovation Activities: Thai Surveys

- ⌘ the percentage of R&D-performing firms that have innovation (71%) is much higher than that of non-R&D-performing firms (29%). An econometric study shows positive correlation between R&D and innovation.
- ⌘ R&D is less important for service firms. What is most important is design and preparations for (service) deliveries
- ⌘ Acquisition of machinery & equipment is important, especially for manufacturing firms
- ⌘ majority of innovating firms conducted non-R&D activities necessary for catching-up, namely reverse engineering (50%) and detailed design (60%)

Firms' Linkages with Other Actors in National Innovation System



Source of Information for Innovation: Korean Firms are More Capable and Active Learners

Thailand

Clients 77.4

Parent /associate company 61.2

Patents 32.0

Universities 35.8

Competitors 42.1

Korea

Clients 77.7

Enterprise within the group 52.9

Patents 59.8

Universities 53.6

Competitors 69.3

Limited Use of Specific Government's Incentives

Government Tax Incentive	Year 1999			Year 2001		
	Inno Firms (n=223)	Non-Inno Firms (n=796)	Total (n=1019)	Inno Firms (n=261)	Non-Inno Firms (n=1985)	Total (n=2246)
Tax deduction for R&D Activity (200% under the Department of Revenue)	4.5%	0.8%	1.6%	5.0%	2.4%	2.7%
Tax deduction for Training (150% under Ministry of Labor & Social Welfare)	7.6%	2.9%	3.9%	7.7%	6.9%	7.0%
Ministry of Industry's Loans and Grants	5.4%	2.4%	3.1%	3.8%	3.2%	3.3%
NSTDA's Loans and Grants	3.1%	1.8%	2.1%	3.2%	1.7%	2.0%

Regional Innovation Survey: Chiang Mai Province 2005

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Chiang Mai in a Nutshell

- ⌘ Chiang Mai is the centre of culture, majority of industrial activity originates from a local craftsmanship.
- ⌘ Tourism and handicraft in Chiang Mai are important and most influential sectors
- ⌘ Business of culture is based on the utilisation of soft and delicate local life style called “Lanna”, which has been there for 7 centuries.



Chiang Mai Innovation Survey



- ⌘ This survey, a joint effort by a research institute and Chiangmai's Chapter of Federal of Thai Industries, aims to indicate potential opportunities in selected clusters that are strategic to the future development of the city, not for international comparison.
- ⌘ Definition of innovation, therefore, has been relaxed to include non-technological innovation.
- ⌘ **Innovation** is the conversion of knowledge and ideas into a **benefit**, which may be for commercial use or for the public good (not necessary being successful)
- ⌘ Questionnaires have been sent to 470 firms (out of 2,459 firm population) and 159 firms responded (33.83%).

Eight Clusters in Chiang Mai

(1)

⌘ These clusters cover majority of industries and services in Chiang Mai.

- ☑ Food and agro-industry cluster: local food (Northern food), preserved food, processed food and beverages.
- ☑ Handicraft cluster: skilled-intensive production of handmade products (e.g. liquor ware, wood-crafting, silverware etc.)
- ☑ Construction and decorative materials cluster: scale-intensive production of construction materials (e.g. roof and tiles, bricks, window frames and pre-cast concrete products), decorative materials (e.g. furniture and house ware)
- ☑ Fashion cluster: textile, garment, leather products, and jewellery.
- ☑ Tourism cluster: tourist attractions, restaurants and hotels, and tour operators and ticketing.

Eight Clusters in Chiang Mai (2)

- ☒ Software cluster: software services and information technology services.
- ☒ Knowledge-intensive service (KIS) cluster: education, consultancy, technical testing, product design, and research & development services.
- ☒ Health cluster: health services (e.g. spa and massage, relaxation and rehabilitation, hospitals) and health products (e.g. functional food and nutraceuticals (FFN) and cosmetochemicals).

Results



- ⌘ Higher rate of innovation (34%) than the national surveys
- ⌘ Many innovations are based on distinctive Lanna Culture, especially in tourism and fashion
- ⌘ Examples are Lanna-style wedding package for tourists, applying local knowledge into new artistic styles of fabric and garment, new treatment in spa business.

Conclusion (1)



- ⌘ To a certain extent, the standard CIS is helpful to differentiate characteristics of two types of catching-up economies: learning intensive (Korea) vs. less successful (Thailand)
- ⌘ To make it more relevant to developing countries, definition of innovation broaden to include more **non-technological innovation** especially new products/services/business methods/ways of doing things based on **local wisdom**, which many ordinary people live on.

Conclusion (2)



- ⌘ Implications from the Thai surveys on conducting surveys in catching-up economies. Questionnaire should include:
 - ☑ usage and effectiveness of ‘specific’ government programmes aiming at enhancing innovative capabilities of firms, such as tax incentive, grant, technical supports
 - ☑ significant capabilities/learning mechanisms for catching-up, besides R&D, namely, reverse engineering, detailed design, testing and quality management