Promotion of University-Industry Mobility of Researchers: A New Role of Thai Universities

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Presentation Outline

- Background and Research Problem
- Emerging Trends in Industrial Sector’s R&D
- Demand and Supply of High-Level R&D Personnel
- Promoting the Role of University Engaging in Private Sector R&D through Mobility of Researchers
- Conclusion
Background and Research Problem
Thailand Economic Growth

Real GDP Growth (annual per cent)

Source: World Development Indicators
Note: The figure for 2010 is a World Bank projection

2011: An Upper-Middle-Income Economy*

*Gross national income per capital between US$3,976 to US$12,275 (using the Atlas method)

Source: The World Bank (2011)
Overcoming the “Middle Income Trap”

Source:
1. Main Science and Technology Indicators, June 2008
3. M Plus
Policy and Target

- Thai Government recently adopted science and technology (S&T) policy with targets to improve the state of science, technology and innovation competitiveness in the country.

- Three main related indicators are expected to more than double by 2016.
  
  - GERD/GDP: from 0.25% to 1.0%
  - R&D personnel (FTE)/10,000 citizens: from 6.7 to 15.0
  - Private sector share in GERD: from 45% to 70%
These targets pose a huge policy challenge for Thailand, in terms of the effort required to stimulate private sector inputs.

Shortage of high-level researchers available to work in the industry will be a major constraint on industry R&D effort.
Promoting New Role of Universities

- University sector in Thailand houses a large pool of researchers.

- This paper looks into ways that could be adopted to promote a new role that Thai universities can play in boosting the R&D and innovation capabilities of industry through mobility their large pool of researchers.
Emerging Trends in Industrial Sector’s R&D
1. Increasing Offshore R&D of Large TNCs
FDI, Net Flows (US$ Billion)

Thailand’s Position in the Global Value Chain
(Stan Shih’s & Smiling Curve)

Thailand has been manufacturing base of TNCs for more than two decades.

Source: Economic Restructuring: Industrial Sector, NESDB proposing to Economic Restructuring Committee
Examples of TNCs Establishing R&D Centre in Thailand
2. Expansion of R&D investment of Local Large Firms
Examples of local large firms significantly expanding R&D investment.
## 3. Increasing Number of SMEs Performing R&D

### Level of Technological Assistance Provided to SMEs

<table>
<thead>
<tr>
<th></th>
<th>Basic Manufacturing standards e.g. GMP/HACCP/TFQS</th>
<th>Medium Improvement product and production process</th>
<th>High R&amp;D and innovation</th>
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<tbody>
<tr>
<td>2006 – 2011</td>
<td>19.4%</td>
<td>63.2%</td>
<td>17.4%</td>
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<tr>
<td>(Mar. 2006)</td>
<td>(2,306 projects)</td>
<td></td>
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<tr>
<td>1992 – 2005</td>
<td>21.5%</td>
<td>70.5%</td>
<td>7.9%</td>
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<td>(716 projects)</td>
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Source: Industrial Technology Assistance Program, NSTDA
4. Transition of Industrial Estates towards S&T-Based Industrial Parks

Phuket Software Park
Demand and Supply of High-Level R&D Personnel
S&T Manpower: Current Situation

- **Skill-Intensive**
- **Technology-Intensive**
- **R&D-Intensive**

**Highly-skilled workers**
- Designers, engineers, scientists, researchers

**Labour-Intensive**

**Skilled Workers**

**High-Level Knowledge Personnel**
Future: Knowledge-Based Competitiveness
(require high-level S&T personnel)

Skilled Workers

High-Level Knowledge Personnel

Designers, engineers, scientists, researchers

Highly-skilled workers

Skilled workers

Labor-intensive

Skill-intensive

Technology-intensive

R&D and innovation intensive
## Projected Demand of S&T Manpower in Thailand

<table>
<thead>
<tr>
<th>Level</th>
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<tr>
<td>Vocational</td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td></td>
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<tr>
<td>Master</td>
<td></td>
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<tr>
<td>Ph.D.</td>
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Local Capacity of High-Level S&T Manpower Production (person/year)

- **Master Level**
  - 2007: Demand 10,200, Supply 730
  - 2011: Demand 21,400
  - 2016: Demand 24,200

- **Ph.D. Level**
  - 2007: Supply 3,500
  - 2016: Demand 4,000
Firms’ Demand for Collaboration with Universities
Share of firms seeking technical assistance or research support from universities and research institutes

Share of firms that indicated an increase in collaboration with universities and research institutes in the past 5 years

Firms receiving technical assistance from universities or research institutes

From survey samples of 45, 55 and 52 firms in food, auto and electronics industry respectively

Percentage of firms having intense cooperation in their innovation activities with academic institutions

<table>
<thead>
<tr>
<th>Collaboration</th>
<th>2001 (n=261)</th>
<th>Collaboration</th>
<th>2003 (n=185)</th>
<th>2006-2008 (n=325)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D Institutes/Universities</td>
<td>13.6%</td>
<td>Universities</td>
<td>18.9%</td>
<td>19.5%</td>
</tr>
<tr>
<td>Other Government Agencies</td>
<td>13.7%</td>
<td>R&amp;D Institutes</td>
<td>21.1%</td>
<td>22.5%</td>
</tr>
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</table>

Note: Only innovative firms were observed.

Promoting the Role of University Engaging in Private Sector R&D through Mobility of Researchers
## University R&D Capacity

<table>
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<tr>
<th>Item</th>
<th>Value</th>
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<tbody>
<tr>
<td>R&amp;D Expenditure (million baht)</td>
<td>5,926</td>
</tr>
<tr>
<td>(33% of GERD)</td>
<td></td>
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<tr>
<td>R&amp;D Personnel (2007) (person)</td>
<td>36,639</td>
</tr>
<tr>
<td>(50% of total R&amp;D personnel)</td>
<td></td>
</tr>
<tr>
<td>S&amp;T Lecturer (2009) (person)</td>
<td>27,881</td>
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<tr>
<td>(55% of total lecturers)</td>
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Barriers to university-industry collaboration (1)

- **Lack of policy support** as reflected in, for example:
  - inflexible rules and regulations concerning permission of a researcher to work in industry e.g. regulation on sabbatical leave does not encourage academic staff to work with the industry
  - requirement of high teaching workload
  - evaluation of faculties’ performance remaining giving priority on academic KPI e.g. publication rather than industrial innovation
  - lack of mechanism to support mobility e.g. financial support to universities as well as researchers
Barriers to university-industry collaboration (2)

- **Rigidity of university’s internal process and organisation culture**, for example:
  - teaching staff substitution
  - issues related to IP
  - academic VS business timeline/deadline
  - language and communication with business sector
  - secrecy agreement
Barriers to university-industry collaboration (3)

- Faculties’s attitude and incentives, for example:
  - university is comfort zone
  - afraid of business deadline
  - obstacles related to logistics problems
  - lack of financial incentives
  - concern about academic career path and promotion
Conclusion
Industry’s demand for collaboration and social pressure for the 3rd mission of university sector.

University executives and a considerable number of faculties, indeed, want to change in order to respond to this direction.

But they feel difficult to dig up deep root of the old paradigm and management system.

who can help, how?

• national policy?
• champions – institution, individual, change agent?
Thank You
for Your Attention