OECD Reviews of Innovation Policy

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• Major international developments
• The OECD Review of Innovation in Southeast Asia
• The OECD Country Reviews of Innovation Policy: current state and approach
• Outlook on possible next steps
Some international developments

- Innovation is increasingly acknowledged as key driver of value creation, economic growth and social welfare.
- An increasing number of countries take steps towards underpinning their economic development by more innovation – including Malaysia.
- Some emerging economies are on the way to become key players in global R&D and innovation – China, India, Brazil, Russia and others.
- Business is adopting new strategies in the context of globalisation (“open innovation”).
- The strong interest in innovation and policies to foster innovation policy is related to:
  - The need to tackle global development challenges (including climate change, health and food security) – this requires innovation.
  - The need many countries perceive to diversify their economies and “moving up the value chain” (e.g., resource-based economies, but also many others).
  - Mobilising new sources for a new model of economic growth.
A changing global R&D landscape, 2012

Source: Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA World Factbook, OECD
The relative size and pace of development of China’s innovation system

Source: OECD Review of China’s Innovation Policy.
OECD Reviews of Innovation Policy
What are OECD Reviews of Innovation Policy?

Three main objectives:

- help individual countries to derive more benefits from OECD work and experience
- deepen the understanding of priority issues in the area of science and innovation by analysing them in concrete national contexts
- facilitate the participation of selected partner countries in mainstream OECD work and help disseminate OECD work

Scope:

- Comprehensive analysis of the respective national innovation system, with a focus on the role of public policy

See: www.oecd.org/sti/innovation/reviews
OECD Reviews of Innovation Policy

- Country-specific Policy Reviews
  - Completed: Luxembourg, Switzerland, New Zealand, South Africa, Chile, Norway, China, Greece, Hungary, Korea, Mexico, Russian Federation, Peru, Slovenia, Sweden
  - Ongoing: Croatia, Colombia, France, Netherlands, Vietnam
  - Under launch: Luxembourg
  - Expression of interest / Under discussion for 2013/14: several OECD Members and Non-members

- Regional Reviews / Platforms
  - Innovation in Southeast Asia (SEA) regional mapping
  - Latin America and Caribbean Innovation Initiative (LACII)
  - Other world regions under discussion

Follow-up
- Bilateral: Luxembourg, Chile, New Zealand, South Africa
- Collective: Roundtable in Beijing (2011), following up on the China Review

Process and methodology: in continuous development (learning by doing), but proven core; adaptive to changing demand in terms of scope, focus, intermediary deliveries, etc. An Impact Survey provided encouraging results and guidance for further improvement.

Peer Review process open to active participation by experts / representatives from other countries / regions.

Co-operation with other international organisations is intensifying: EU project SEA-EU-NET (SEA Review), World Bank (joint Review of Vietnam), IDB (Peru), UN-ECLAC (LA), discussions with UNESCO, UNCTAD
What does each Review cover?

- Overall Assessment and Recommendations
- Mandatory / core items
  - Innovation and economic performance
  - Framework conditions for innovation (macroeconomic stability, regulatory framework, competition, etc.)
  - International benchmarking of innovation performance
  - Fostering business R&D and innovation
  - The role of universities and Public Research Organisations – Industry-science linkages
  - Internationalisation of R&D
  - Human resources for science and technology
  - Knowledge infrastructures
  - Governance of the innovation system, policy mix, evaluation
- Special emphasis on specific issues, depending on the country under review
- Impacts: typically high to very high
What do the Innovation Policy Reviews try to achieve?

• The Reviews are designed to contribute to
  . awareness of innovation and contribute to agenda setting
  . improve the integration STI policy in economic policy
  . stimulate dialogue among main stakeholders
  . identify binding constraints for improved innovation performance
  . help better co-ordination of policies across government
  . improve institutional arrangements and governance mechanisms
  . optimise the innovation policy mix and the design and delivery of individual instruments

• Providing specific recommendations

• Aligning scope, timing, presentation etc. to the strategic needs of the country reviewed
The policy domains covered by the reviews

**Framework conditions for innovation**
(Functioning of markets, regulation, corporate governance, education, communication infrastructures, etc.)

**Science, technology and innovation policy**

**Demand-side measures**
- e.g. Procurement policies
- e.g. Promotion of innovation in SMEs

**Policies to support investment in science & R&D**
- e.g. R&D tax incentives

**Policies to enhance innovation competencies of firms**
- Grants
- e.g. Public-private partnerships

**Policies to strengthen linkages within innovation systems**

**Supply-side measures**
Procedure for a standard review

- Agreement on Terms of Reference (ToR) between the OECD and a representative Ministry / Public Agency of the country to be reviewed
- The country to be reviewed provides a Background Report (usually drafted by national experts)
- The OECD Review team carries out a fact-finding mission to interview major stakeholders in the national innovation system
- The OECD Review team prepares a draft report including an overall assessment and recommendations
- Consultations with the country reviewed
- Reporting to / peer-review at the OECD’s Committee for Scientific and Technological Policy (CSTP) / Working Party for Technology and Innovation Policy (TIP)
- The final report is published under the responsibility of the Secretary-General of the OECD
- The Review’s findings and recommendations are presented at one or more special events in the country reviewed

... normally a 12-month exercise in total
The OECD Review of Innovation in Southeast Asia
OECD review of Innovation in Southeast Asia: Context

- first OECD innovation mapping in a transnational region
- It has been welcomed and supported by the ASEAN Committee of Science and Technology (COST), and numerous national policy makers and experts have shared their knowledge and insights
- The review was supported by Germany and Japan, the SEA-EU-NET project (S&T dialogue between Southeast Asia and EU) as well as Korea
- ... but would not have been possible without the interest and support from Southeast Asian countries
OECD Review of Innovation in Southeast Asia: Scope and aims

• The Review of Innovation in Southeast Asia provides:
  . A cross-country regional synthesis highlighting economic trends with special reference to innovation; quantitative and qualitative mapping of current capacity and dynamics in S&T and innovation
  . A set of country profiles drawing on the OECD innovation review approach; they cover the performance and institutional profile of the innovation system and take account of the economic environment and framework conditions for innovation – but they were not planned to be policy reviews

• The Review of Innovation in Southeast Asia is therefore a first step and aims at:
  . Obtaining a more comprehensive overview of key elements, relationships and dynamics of innovation in the SEA region, and the opportunities to enhance them
  . Provide a platform for future in-depth innovation policy reviews in SEA; a first example is the on-going Review of Vietnam’s Innovation Policy (in this specific case joint OECD-World Bank)
# Catch-up with the United States 1970-2010

Level and average annual growth rate of GDP at constant market prices, using 2005 PPPs

<table>
<thead>
<tr>
<th>Initial GDP level to the United States</th>
<th>Annual rate of catch-up to the US</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>(C1) &gt; 3%</td>
</tr>
<tr>
<td></td>
<td>(C2) 1% &lt;= &lt;3%</td>
</tr>
<tr>
<td></td>
<td>(C3) 0% &lt;= &lt;1%</td>
</tr>
<tr>
<td></td>
<td>(C4) &lt; 0%</td>
</tr>
</tbody>
</table>

| (L1) 60% < | | Japan, EU15 |
|------------| | Brunei-Darussalam, Bahrain, Kuwait, Qatar, Saudi Arabia, UAE, Australia |

<table>
<thead>
<tr>
<th>(L2) 20% &lt;= &lt;60%</th>
<th>Singapore</th>
<th>Hong Kong, China; Oman</th>
<th>Iran</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>(L3) 5% &lt;= &lt;20%</th>
<th>Chinese Taipei, Korea</th>
<th>Malaysia, Sri Lanka, Thailand</th>
<th>Mongolia</th>
<th>Fiji, Philippines</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>(L4) &lt;5%</th>
<th>Cambodia, China</th>
<th>India, Indonesia, Laos, (Myanmar, Viet Nam)</th>
<th>Bangladesh, Nepal, Pakistan</th>
</tr>
</thead>
</table>

Source: Asian Productivity Organization (APO) Databook 2012 [APO (2012)]
Labour productivity gap relative to the US, 2010
In percentage points

Note: at constant market prices, using 2005 PPPs.
Sources: APO (2012) based on official national accounts, including adjustments.
Driving forces of economic growth are shifting

- Non-IT capital accumulation was most important over the longer term, especially during early stages of industrialisation and catching up.
- Its contribution is still important but became smaller over time.
- In contrast, the role of IT capital accumulation and TFP growth is increasing in various countries.
- Observe China’s high and sustained TFP growth.
Growth decomposition, 1970-2010

Source: Asian Productivity Organization (APO), APO database.
Global value chains (GVCs)

• Continuing trend towards “unbundling” of production activities
• SEA producers increasingly embedded in GVCs, with numerous consequences
  . Evolving position in GVCs shapes trade structures, e.g. in textiles, electronic / electrical goods, automotive – opportunities for learning, backward / forward integration
  . ... and hence larger economic and innovation opportunities
  . The position in GVCs is linked to the geographical structure of (export-promoting) FDI and trade flows

• A virtuous circle of innovation
  • In contrast, “middle-income trap” highlights the specific exposure on both ends of the spectrum of production
Major Trade partners for Asia's intermediate exports in goods and services

Southeast Asia’s innovation imperative

- Current innovation weaknesses of SEA economies:
  - Framework conditions for innovation
  - Infrastructure and human capital, in varying degrees
  - Mostly very low overall investment in S&T and innovation
  - Indigenous innovation capabilities remain relatively weak overall in the majority of countries (compared to evolution of 1st generation East Asian Tiger economies such as Korea)
  - Lack of regional or global brands

- Dynamic interaction within the larger region including China:
  - Medium-term outcomes for SEA economies will to a significant degree depend on domestic innovation capabilities
  - This conclusion is robust under different possible scenarios of competition and co-operation
Framework conditions for innovation: Infrastructure

- Various infrastructures are carriers and enablers of innovation
- Even the basic infrastructure is still lacking in some of the SEA countries
- High and middle-income countries have made impressive strides in developing their infrastructure over the last 30 years but new challenges and needs emerge as they move forward towards a knowledge-based economy

Percentage of population without electricity, 2009 (World Bank)

Internet users as a percentage of the population (2011) (ITU)
Framework conditions for innovation: Regulation
World Bank “Doing Business” indicators for start-ups

<table>
<thead>
<tr>
<th>Country</th>
<th>2013 Rank</th>
<th>Procedures (number)</th>
<th>Time (days)</th>
<th>Cost (% of income per capita)</th>
<th>Paid-in Min. Capital (% of income per capita)</th>
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<tr>
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<td>10</td>
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<td>8</td>
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<tr>
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<tr>
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<td>9</td>
<td>94</td>
<td>534.8</td>
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Human capital for innovation

- Many skills sets important for innovation
- At the basic level, adult literacy rates are comparatively high in most SEA countries
- Secondary enrolment rates are more mixed; engineering skills are particularly important in catching-up, but remain under-developed
- TIMSS and PISA 2009 Plus results indicate performance in mathematics and science – Malaysia has some way to go to catch up with leaders
Tertiary education

- Tertiary education – both in academic and vocational skills – is essential for technological upgrading and innovation more broadly

- Enrolment rates in tertiary education vary significantly within the region with the level of development, with Malaysia in the leading group

- Reflecting the state of development, the proportion of public expenditure on tertiary education from education budgets tends to be rather low in many countries. Singapore and Malaysia are leading in the region on these terms
R&D intensity

GERD as a percentage of GDP in selected countries

Sources: UNESCO, OECD, MASTIC.

Note: A significant increase to slightly above 1 percent of GDP was reported for Malaysia for 2009.
R&D performers

- There is a strong intra-regional variation in the weight of the business sector in R&D performance - with Malaysia in a lead position; where BERD is comparable to OECD levels, MNEs tend to be dominant performers.

- There is also a wide variety in the relative weight of HEIs and PRIs in performing R&D - in those countries that are more technologically advanced and have significant R&D activities in firms, HEIs dominate. In those with weaker firm performance, PRIs tend to be more dominant.

Balance in R&D expenditures between government labs and universities (2007 or nearest year)  
(Source: UNESCO)

BERD/GERD (2007 or nearest year)  
(Source: UNESCO)
Scientific publications have grown in volume . . .

- The region has shown strong growth in scientific publications and now accounts for around 4% of the world share (up from 2.5% 10 years ago)
- Despite its small size, Singapore accounts for a disproportionate volume of papers (200-10) followed by Thailand and Malaysia. Indonesia produces very few publications for the size of its scientific community – the largest in ASEAN
- Some countries have, however, outpaced Singapore in their publication growth, though often from low initial levels. Malaysia has shown the most impressive growth, particularly since 2007
... and are relatively highly cited and show strong international linkages

- Since 2005, average relative citation rates are above the world average, though this is more a reflection of Singapore’s strong performance
- The region as a whole has the highest levels of international scientific collaboration in the world, as measured by joint authorship

Source: Science-Metrix using Scopus (Elsevier) database
PCT patent applications, average annual growth rates, 2000-09

Source: OECD Patent Database.
Different priorities for different types of SMEs

Source: OECD DSTI.
The innovation imperative – innovation at different stages of development

- **Less developed:**
  - Significance of non-technological innovation
  - Technology adoption, incl. “embodied technology” imports (machinery and equipment); some adaptation
  - Anticipating of steps in development to avoid persistent lock-in in low value-adding activity; little learning opportunity (growth without development)

- **Middle income:**
  - Threat of “Middle-income trap”
  - Innovation (incl. in “high-tech” sectors) often largely residing in MNEs; sometimes less efficient government enterprise sectors; lack of competition in parts of the economy
  - Spillovers to other parts of the economy, esp. to local suppliers, “backward integration” are critical and often not meeting initial expectations
  - Challenge of developing advanced innovation capabilities, including around integration, branding, etc.; to diversify and move into new value-adding production
  - Requires effective STI governance mechanisms and delivery

- **Advanced:**
  - Shifts in the quality and composition of innovation activity
  - Increased significance of formal R&D activity; fostering excellence in S&T and education
  - Access to leading-edge knowledge, e.g. local research centres, but also international R&D linkages

- Converging agendas for innovation – large scope for mutual learning
Thank you for your attention

For more information, please

go to the web:
www.oecd.org/sti/innovation/reviews

or contact :
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