Intellectual Assets and Creating Value:

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Yoshiaki TOJO
Head, Economic Analysis and Statistics Division
Directorate for Science, Technology & Industry
OECD
Key Messages:

- Innovation becomes increasingly important for sustainable growth and development in globalised, ICT driven, knowledge-based economy.

- Open Innovation paradigm is emerging, and knowledge chain is globalising as production chains. Intellectual asset-based management plays a larger role.

- Intellectual assets are complementary and work as a whole. First recognise your intellectual assets, then fully utilise them to extract value.
Message 1

Innovation becomes increasingly important for sustainable growth and development in globalised, ICT driven, knowledge-based economy
Innovation becomes increasingly important for sustainable growth and development.

- Innovation is the key driver of economic growth - new and improved products, processes and services account for the bulk of economic growth since the Industrial Revolution.
- Innovation is of growing importance to economic activity in OECD countries – global competition is forcing all countries to upgrade their economic activity and move up the value chain.
- A growing number of countries has recognised the importance of innovation, e.g.:
  - Lisbon strategy in the EU
  - Policy strategies in the US, Japan and Korea to strengthen innovation
  - Growing policy focus outside the OECD, notably in China.
Investment in R&D has been increasing, reflecting improved economic environment and growth of knowledge intensive industries...

Trends in R&D Intensity(1) by area, 1991-2004 (as % of GDP)

1. Gross domestic expenditure on R&D as a percentage of GDP.
2. Data are adjusted up to 1995.
Non-OECD countries are also increasing their presence in worldwide R&D activities...

R&D intensity in non-member countries

Source: OECD, Main Science & Technology Indicators database
... and increasing their presence in worldwide R&D activities.

Source: OECD, Main Science & Technology Indicators database
China will become world’s second highest investor in R&D by end of 2006

Gross Domestic Expenditure on R&D (billion current PPP $), 1981-2006

Source: Science, Technology and Industry Outlook 2006
R&D investment positively co-relates with triadic patent generation...

Number of Triadic Patents per million of working age population and business-sector R&D Intensity

1. 2002 for Australia, Austria, Portugal, Switzerland and Turkey; 2001 for Greece and Mexico.
Source: OECD, Main Science and Technology Indicators database.
... so changes in R&D expenditure are mirrored by changes in patenting.

Trends in Triadic Patent Families
R&D is positively correlated with innovation in manufacturing ...

Share of successful innovators and business-sector R&D intensity in manufacturing
... but not with innovation in services...

Share of successful innovators and business-sector R&D Intensity in services

1. Innovation density is defined as the number of firms claiming to have introduced a successful innovation as a percentage of total firms over the period considered.

Source: Eurostat Survey and OECD, Main Science and Technology Indicators database.
... since there are various non-R&D investments for innovation.

Share of innovative firms engaged in different innovation activities, 2000 (%)

Note: Figures are merely indicative (simple average of available country shares) and should be considered as such.

Source: Figure 4.13 in “Promoting Innovation in Services”, Chapter 4, in OECD Science, Technology and Industry Outlook 2004, based on Eurostat, CIS3 survey 2004 (OECD, 2004b).
Investment in knowledge (R&D, education, & software) is catching up for that in tangible capital.

Investment in knowledge versus investment in gross fixed capital formation

Knowledge Investment > GFCF

1. 1994-2001 for Greece and Italy, 1995-2002 for Korea. EU figure excludes Belgium, Greece and Italy. OECD figure excludes Belgium, Greece, Italy and New Zealand.
2. Excludes Greece and Italy.
3. 2001 data.
In some countries intangible assets match fixed capital stock.

Intangible Capital Accumulation in the United States (% of business output)

- Including intangibles
- Existing NIPAs
- Excluding software

IAAs = 10~11%
GFCF = 11%
Investment in Intellectual Assets in the United States, % of business output

Note: C.I. = Computerized information
Message 2

Open Innovation paradigm is emerging, and knowledge chain is globalising as production chains. Intellectual asset-based management plays a larger role.
Innovation model was recognised as closed and unilinear.
Emerging open innovation paradigm has various input and output channels
**Major Characters of Open Innovation**

- Rise of Innovation Intermediaries and Their Markets
  - Equal importance given to external knowledge and internal knowledge.
  - Outbound Flows of Knowledge and Technology

- Centrality of the Business Model in Extracting Value from R&D
  - Dilemma in Innovation Management:
  - Proactive and Nuanced Role of IP management
R&D activities are increasingly globalised...

R&D expenditure of foreign affiliates, % of R&D expenditure of enterprise, 1995 & 2005
Foreign ownership of domestic inventions

Domestic ownership of inventions made abroad

Notes:
1. Share of patent applications to the EPO owned by foreign residents in total patents invented domestically.
2. Share of patent applications to the EPO invented abroad in total patents owned by country residents.
Data are according to the residence of the inventors. The EU is treated as one country; intra-EU co-operation is excluded.
Human resources for R&D activities also become mobile.

Immigrants as a % of highly skilled native population

Emigrants as a % of highly skilled in the country of origin

OECD STI Scoreboard 2005
Guellec and van Pottelsberghe (2004)

Long-term elasticities of output with respect to R&D variables

- Business R&D: 0.132
- Foreign R&D: 0.459
- Public R&D: 0.171

Luintel and Kahn, mimeo

Mean elasticities of R&D variables

- Business R&D: 0.025
- Foreign R&D: 0.010
- Public R&D: 0.022

* Luintel and Kahn includes human capital, public infrastructure, hi-tech trade, and FDI in their GMM System estimation.
Message 3

Intellectual assets are complementary and work as a whole in better management. First recognise your intellectual assets, then fully utilise them to extract value.
Intellectual Assets should be developed, retained, and commercialised for value creation by firms.

Intangible investment

- Research & Development
- Training & Education
- Back Office Spending (Marketing, Customer Relations…)

Intellectual Assets/Capital Accumulation

- Knowledge (IPR, Product, Process)
- Human Resources (Skills, Creativity,..)
- Organisation / Network Reputation / Brand

Value Creation

- Market of IAs
- Product Market
- Productivity
The ability to create economic value from IAs is contingent on the firm’s management capabilities.

**Development/Control**
- Intangible investment

**Commercialisation**
- Intellectual Assets/Capital Accumulation
- Value Creation

**IA-based Management**

- Corporate Governances
- Internal Control / Risk Management
- Disclosure / Reporting on IAs
Additional *public disclosure on intellectual assets would enhance financial market efficiency.*

Studies provide evidence that valuation in financial markets are influenced by disclosure on intellectual assets.

- A unit increase in R&D leads comparable increase in market valuation, greater than that for tangible investment.
- Stock price increase with FDA’s approvals was doubled to 1% with qualitative info, and quadrupled with quantitative info.
- Companies with better general reporting in line with PWC’s benchmark enjoyed a lower cost of capital.
- The link between corporate transparency and stock price volatility is stronger for smaller companies.
Growing number of initiatives address to disclosure of intellectual assets.

Selected Frameworks and Guidelines of reporting on IAs

<table>
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<th>Institution/Country</th>
<th>Scope</th>
<th>Year</th>
<th>Reference</th>
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<tbody>
<tr>
<td><strong>Narrative/non-financial reporting</strong></td>
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<tr>
<td>European Union</td>
<td>All companies</td>
<td>2003</td>
<td>Modernisation Directive (4th and 7th Directives)</td>
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<td></td>
<td>Listed companies</td>
<td>2004</td>
<td>Transparency Directive</td>
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<td>Australia</td>
<td>Listed companies</td>
<td>2003</td>
<td>ASX Listing Rule, Australian Stock Exchange</td>
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<td>Canada</td>
<td>Listed companies</td>
<td>2003</td>
<td>Continuous Disclosure Obligations, Sec. Admin.</td>
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<td>Germany</td>
<td>All companies</td>
<td>2004</td>
<td>GAS 15 Management Reporting, DRSC</td>
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<td>United Kingdom</td>
<td>Quoted companies</td>
<td>2005</td>
<td>Operating and Financial Review, DTI</td>
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<td>United States</td>
<td>Listed companies</td>
<td>2003</td>
<td>Management Discussion and Analysis, SEC</td>
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<td><strong>Specific reporting about intellectual assets</strong></td>
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<tr>
<td>European Union</td>
<td>All companies</td>
<td>2002</td>
<td>Guidelines on Intangibles, MERITUM Project</td>
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<td>Australia</td>
<td>All companies</td>
<td>2002</td>
<td>Guiding Principles on Extended Performance Management</td>
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<td>Austria</td>
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<td>Austrian Universities Act</td>
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<td>Denmark</td>
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<td>2003</td>
<td>Intellectual Capital Statements, MSTI</td>
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<td>Germany</td>
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<td>Intellectual Capital Statement, BMWA</td>
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<tr>
<td>Japan</td>
<td>All companies</td>
<td>2005</td>
<td>Guidelines for Disclosure of IA-based Management, METI</td>
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Source: OECD
Ability to create economic returns from intellectual assets also depends upon economy-wide business environments (→ IAs for Nation / Region / Cities).

Intangible investment

· Openness
· Education
· Public R&D

National / Regional IAs

Knowledge Pool

Human Resource Pool

Creative Culture

Diffusion/Mobility

Firm-level IAs

Development/Control

Intellectual Assets/Capital Accumulation

Commercialisation

Value Creation

IA-based Management
OECD Work on Intellectual Assets
OECD Ministers noted the growing importance of intellectual assets and welcomed proposed follow-up study in this area.

The report on Intellectual Assets and Value Creation was submitted to the Ministerial Council Meeting (MCM), May 2006. (A compendium of the background papers shall be finalised by the end of 2006.)

“Minister noted the growing importance of intellectual assets ... and welcomed ... the follow-up study on ... intellectual assets as a driving force for innovation and value creation.”
**Major Findings of the initial IA-VC Project**

1. Intellectual Assets play substantial and growing role in economic growth. Good management is indispensable for earning economic returns from IAs.
   → encourage the diffusion of best practices of reporting and management.

2. Firm needs access to the skilled labour force and knowledge stock, as well as tools to protect and control the use of IAs.
   → provide a proper business environment, including IPR, competition policies, regulation, education, labour market.

3. The role of intellectual assets in innovation and the value creation process needs further investigation.
   → conduct further study on firm-level data as well as estimation of intellectual assets in national accounts
Follow-up Study on Intellectual Assets

1. Schedule.
   from Q4/2006 through Q1/2008
   essential analysis … 2007
   synthesis report for Ministers … Q1/2008

2. Study Outline.
   1) Firm-level IAs in value creation and their management
   2) IAs in national accounts and economic growth
   3) IA “commons” in regional clusters
Firm-level Analyses (1st module)

Value creation processes are far richer than economy-wide aggregation.

1. Firm-level analyses on IAs and value creation
   - Microdata analysis of innovation (SWIC/NESTI)
   - Survey on economic use and impact of patents (NESTI)
   - Case studies on globalisation and open innovation (TIP)

2. Corporate governance in IA-intensive sectors (SGCG)
   - Analysis on small capitalised listed companies
   - Analysis on large companies in IA-intensive sector

3. IAs and their management in high-growth SMEs (WPSME)
Conclusion
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Thank you

yoshiaki.TOJO@oecd.org