Industry-Academia-Government Collaboration and Innovation, University, Competition and Patent System

June 11, 2009

Isamu Sojyo

Visiting Professor,
Innovative Collaboration Center of
Kyoto University

Industry-Academia-Government Collaboration

On-the-Spot Report

Opinions at the International Patent Licensing Seminar (on January 28, 2008)

"Technology Transfer: Achieving Balance Always"
Dr. Patrick L. Jones, President, Association of University Technology Managers (AUTM)

"Objectives of Industry-Academia Collaboration Are to Explore Newer Frontiers in 'Research' and 'Education' as 'Social Contribution'"
Akio Toshimitsu, Director/Professor, Innovative Collaboration Center of Kyoto University

"The Primary Objective of Industry-Academia Collaboration Using Intellectual Property Is to Foster Innovation"
Dr. Shin Ito, President and Representative Director,
Tokyo University of Agriculture and Technology TLO CO., Ltd.

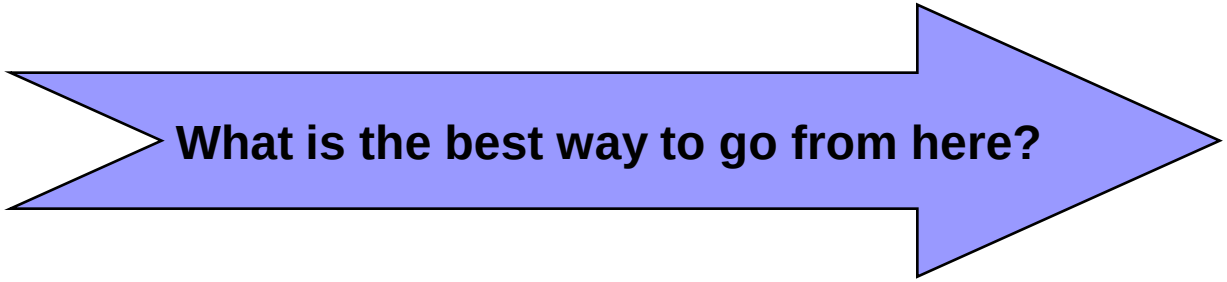
"We Cannot Evaluate Industry-Academia Collaboration in Terms of Licensing Revenue Alone"
Kenichi Muramatsu
Intellectual Property Department, Eisai Co., Ltd

Industry-Academia-Government Collaboration

On-the-Spot Report

Various Current Data Relating to Industry-Academia Collaboration

- Flow of corporate R&D funds to universities: 1%
- Ratio of private funds to university research funds: 2.6%
- Average R&D funds borne by companies: 2,190,000 yen
- Collaborative research costs etc. borne by companies: approx. 50 billion yen per year
- Royalty income of national university corporations: 440 million yen per year
- Personnel in the intellectual property departments of universities (current): 1,658



Source: The Japan Economic Research Institute (March 2006), FY2004 Japan Patent Office Research Project, "Research Result Report of Research Project on Intellectual Property Right in Universities," FY2003 Statistics Bureau, Ministry of Internal Affairs and Communications "Report on the Survey of Research & Development," Science and Technology Council of Ministry of Education, Culture, Sports, Science and Technology

Katsumi Sakurai
Intellectual Property and Licensing Department, Kajima Corporation

Industry-Academia-Government Collaboration

From Theory Analysis to Practice

"Why Industry-Academia-Government Collaboration?"

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My Views

(1) "Economic growth slowdown of developed countries since the 1970s"

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"Downsizing of technical innovation"

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"Innovation cannot be achieved if only private companies do research and development."

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"Incorporation by companies of grand innovations sought by universities, which do not pursue profit"

"Universities should build a strong bond with society as community members."

(2) Emergence of the global capitalist market, led by disintegration of the Soviet Union, brought about competition not only among companies, but at university, national and individual levels.

(3) Quantum mechanics

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Development of Electronics

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Modularization, digitalization and intelligent development of hardware

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Age of multi-element technology + end of the era of central research institutes

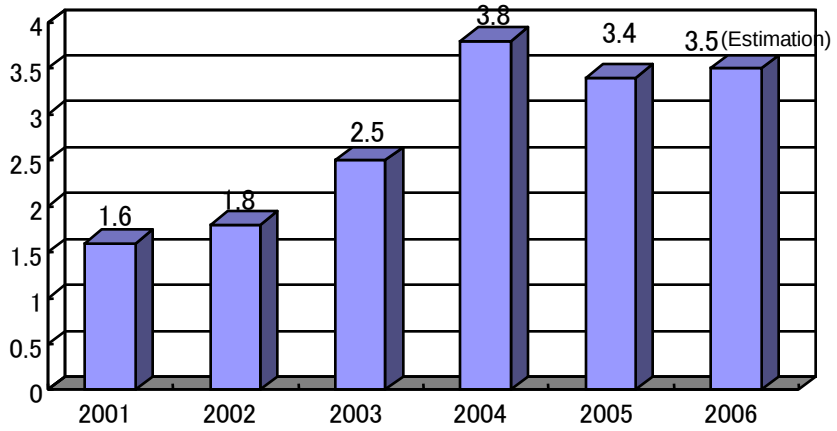
Industry-Academia-Government Collaboration

From Theory Analysis to Practice

Global Economic Growth Rate in 10-year Units (%)

Period	Global Annual Growth Rate	Annual Growth Rate per Person
1950-60	4.9	3.1
1960-70	5.2	3.2
1970-80	3.4	1.6
1980-90	2.9	1.1
1990-94 (Prompt announcement)	1.4	-0.3

Trends in Real Growth Rate of Global GDP (%)



$\frac{\text{OECD}}{\text{Global GDP}}$ = 85% (1973) → 80% (2004)

China + India: 8% of global GDP (2004)

In five years from start of 21st century

Global GDP: 13% increase

Japan's GDP: 6% increase

China's GDP: 55% increase

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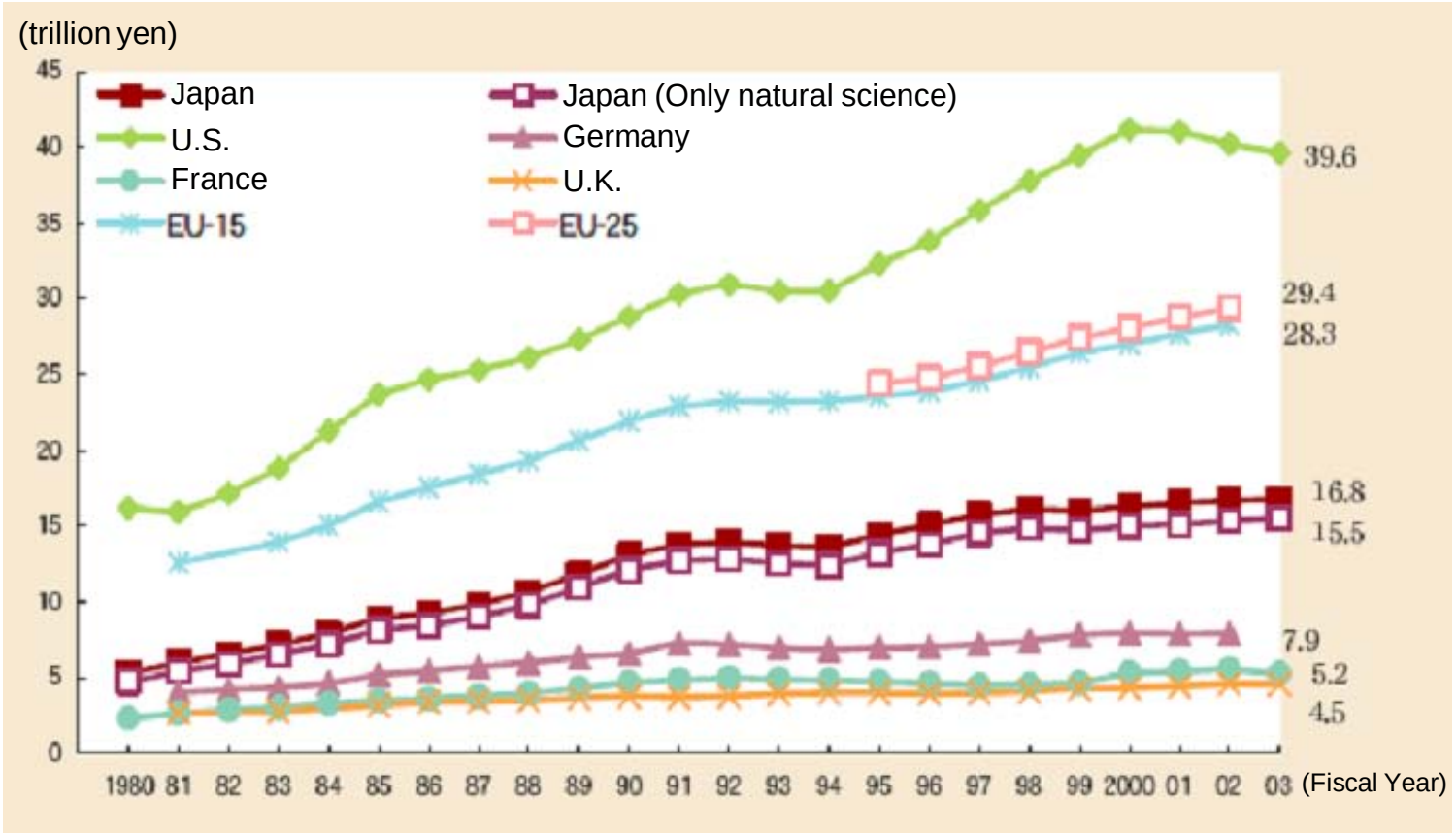
From Theory Analysis to Practice

Trends in R&D Expenditures of Selected Countries

OECD purchasing power parity



Source: White Paper on Science and Technology (2005)

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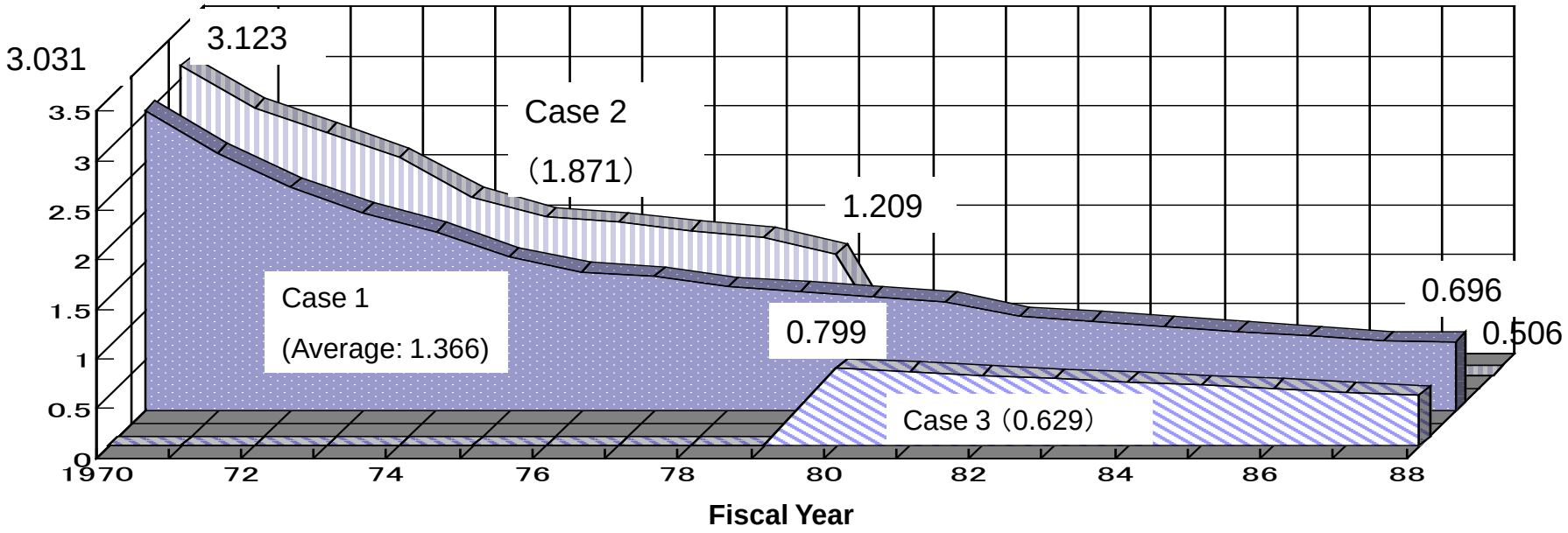
From Theory Analysis to Practice

Decrease of R&D Return on Investment



Effect of R&D Investment (Stock) on GNP Increase

Case	Period (fiscal years)	
1	1970-88	+0.230
2	1970-79	+0.245
3	1980-1988	+0.173

Notes: Effect of R&D investment (stock) on GNP increase =
GNP increase rate / R&D investment (stock) increase rate

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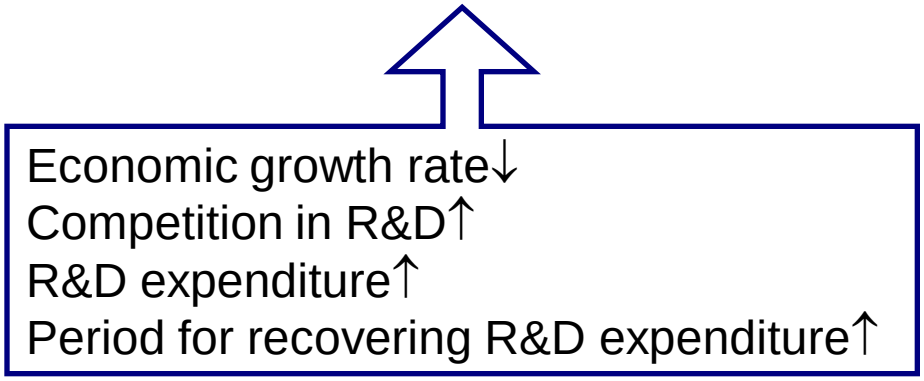
From Theory Analysis to Practice

Downsizing of Technical Innovation

- Downsizing of technical innovation
- For economic reasons, it is no longer possible for a company to realize such major technical innovation that it will take some time for its competitors to catch up, enabling the innovator to enjoy considerable profit from the technology.



- **Technology** is the essence of differentiation strategy for developing marketable products.
- Technical innovation that is soon matched, although it requires considerable (subjectively speaking) R&D expenditure

Parallelization of R&D activities

- Parallelization of R&D activities
- Companies begin research dealing with the same subject as their competitors at the same time point, so the ending time and the research results become similar.
- How do companies think about these situations?

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From Theory Analysis to Practice

Holding of patent is key to industry-academia-government collaboration.

∵Companies are attracted by exclusive power of patent.

However, compared to corporate inventions,
most university inventions have weak points:

- They are based on little experimental data.
- There are few practical examples and comparative examples.
- They overlap content that has been presented at conferences.

In order to encourage many universities to patent their inventions (concepts), it is recommended to adopt a system in which the Japan Patent Office may accept:

- Application without claims
- Addition of data after application

} under certain conditions pertaining only to application from universities.