
To the Next Stage of University-Industry Collaboration in Japan

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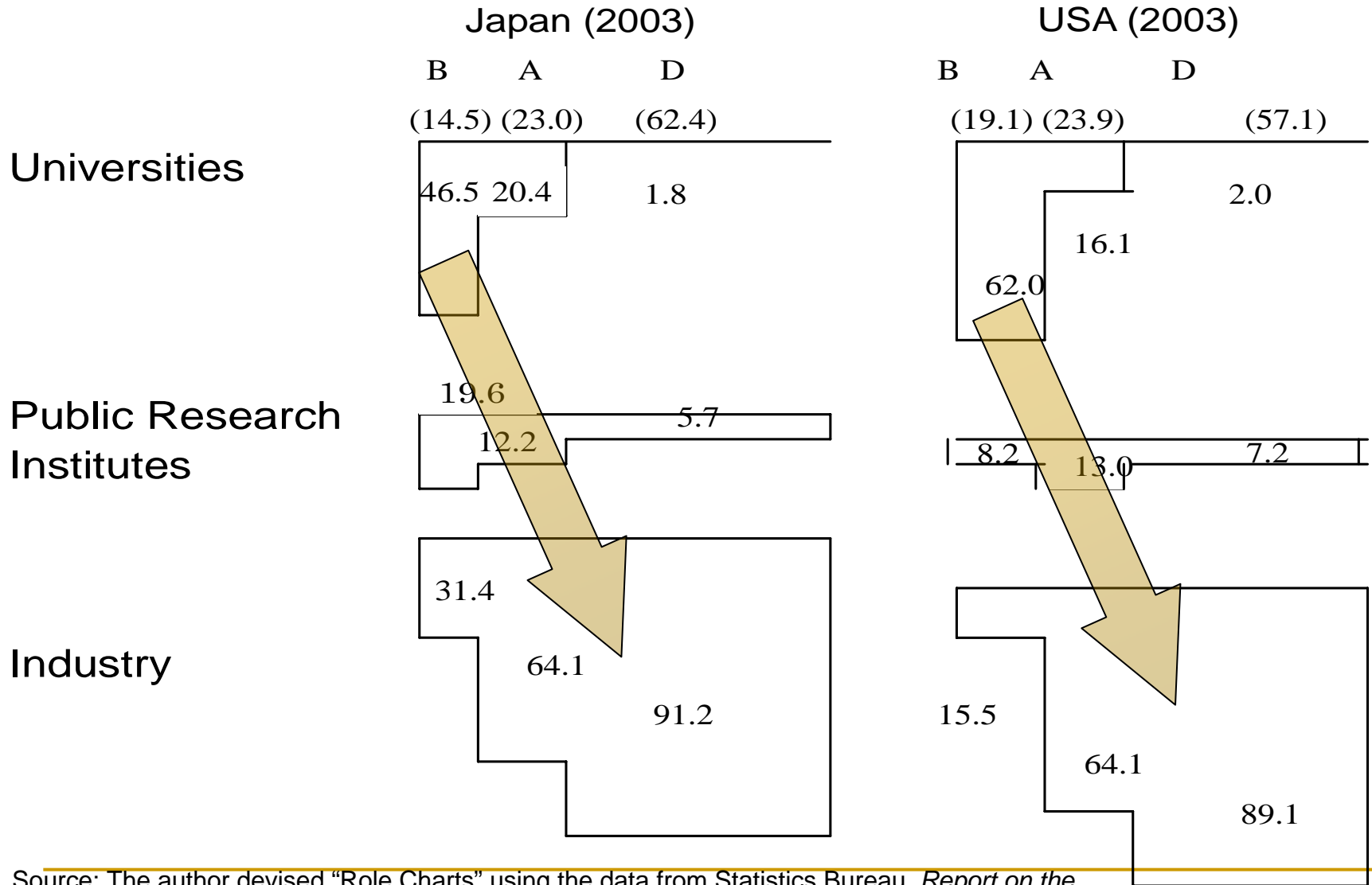
Outline of Presentation

- Increasing University-Industry Collaborative Activities
- Policies to Have Changed University-Industry Collaboration
- Decreasing Public Interests in Mere Collaboration
- Policies including University-Industry Collaborative Activities
 - Regional Innovation
 - SME Promotion

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- Concluding Remarks

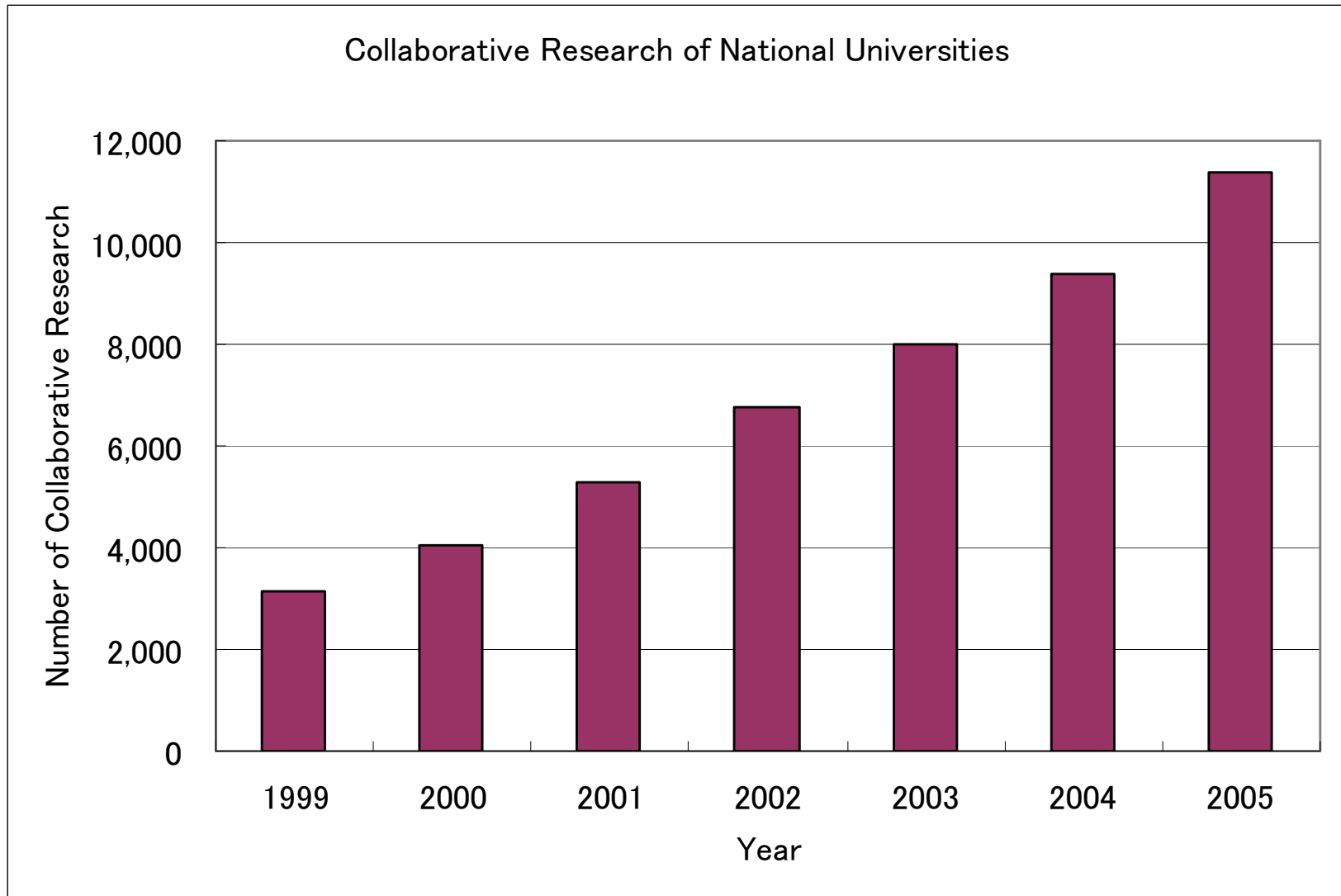
Role Charts

(unit: %)



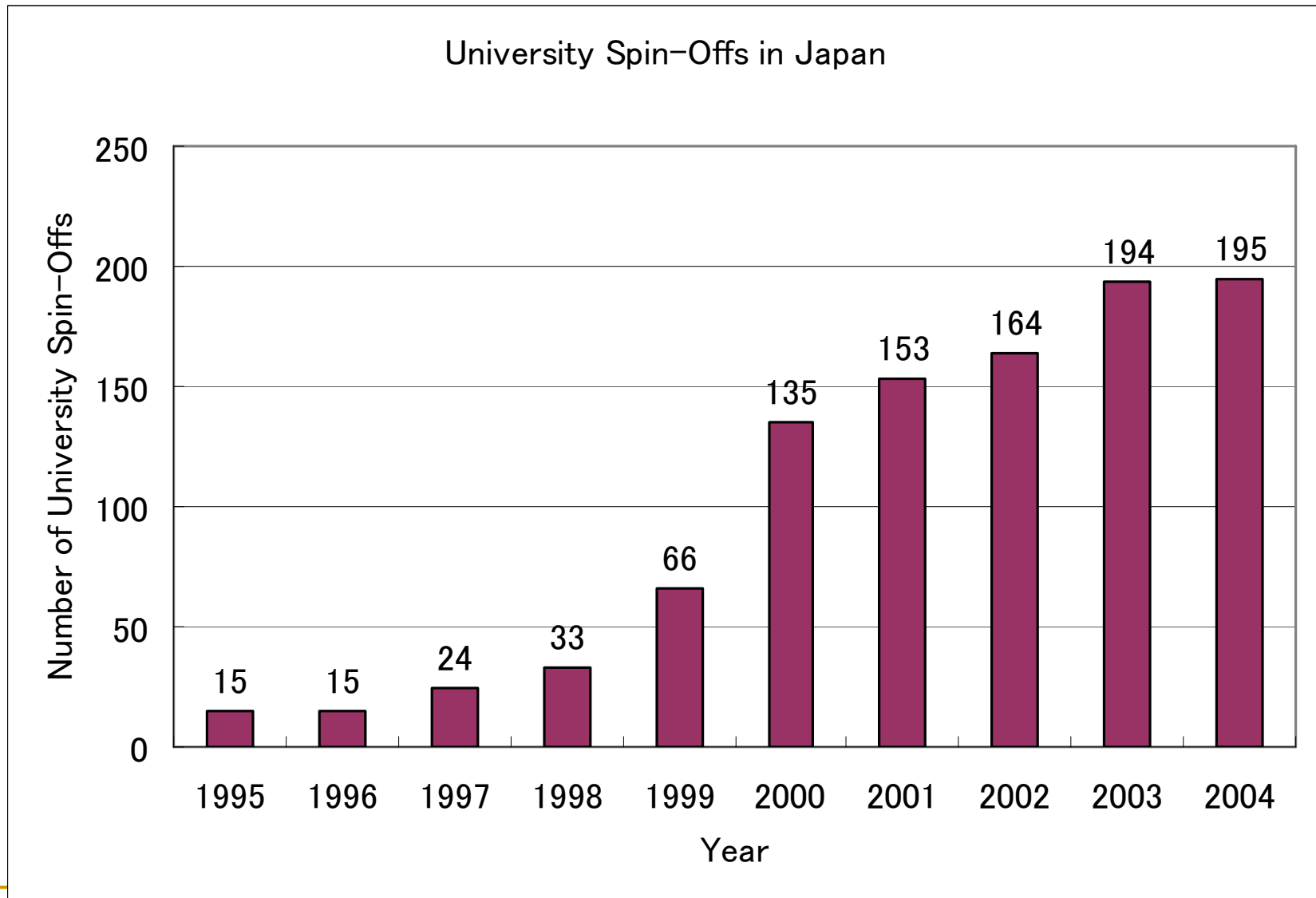
Source: The author devised "Role Charts" using the data from Statistics Bureau, *Report on the Survey of Research and Development 2004* (in Japanese), Japan Statistical Association, and OECD, *Research and Development Statistics: 2004 Edition*.

University – Industry Joint Research



Source: The author drew the graph using the data of MEXT.

University Spin-Offs in Japan



Source. The survey conducted by the author and Prof. Kikumoto and Dr. Shinya in 2005.

Trends of Joint Research at Yokohama National University

- Deepening and Diversification -

■ Deepening

- Number of joint research projects per company increased.
- Joint research projects with large budget increased.
- Joint research in the same prefecture increased in terms of number and total budget.

■ Diversification

- The budget difference between the largest and the smallest became wider.
- Joint research projects with new companies including MNCs increased.
- The ratio of university researchers conducting joint research with companies over all university researchers increased.

Source: K. Sakamoto and M. Kondo, The Analysis of University-Industry Research Collaborations by Time Series and Corporate Characteristics (in Japanese), Development Engineering, Vol.10, 11-26, 2004.

Policies to Promote University-Industry Relation in Japan

Joint Knowledge Creation

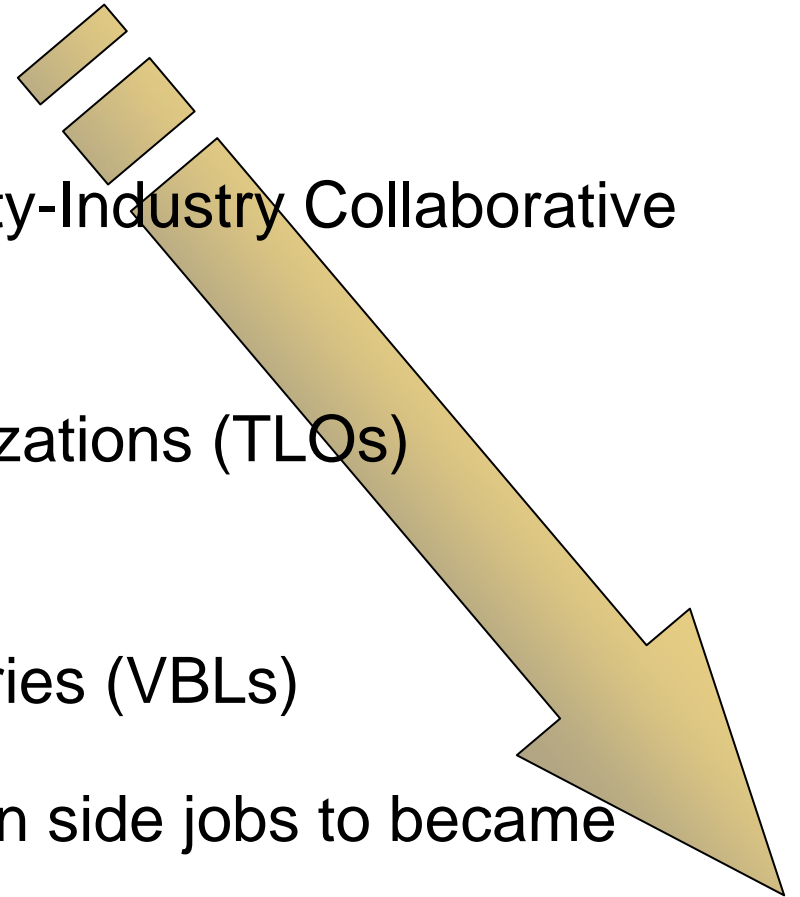
- Joint Research Centers
- Research Grants for University-Industry Collaborative Research

Knowledge Transfer

- Technology Licensing Organizations (TLOs)
- University IPR Headquarters

Knowledge-based Starting Up

- Venturing Business Laboratories (VBLs)
- Incubation Centers
- Relaxation of the regulation on side jobs to become corporate executives
- University option to receive equity shares instead of cash for patent royalty



Policies to Have Changed University-Industry Collaboration

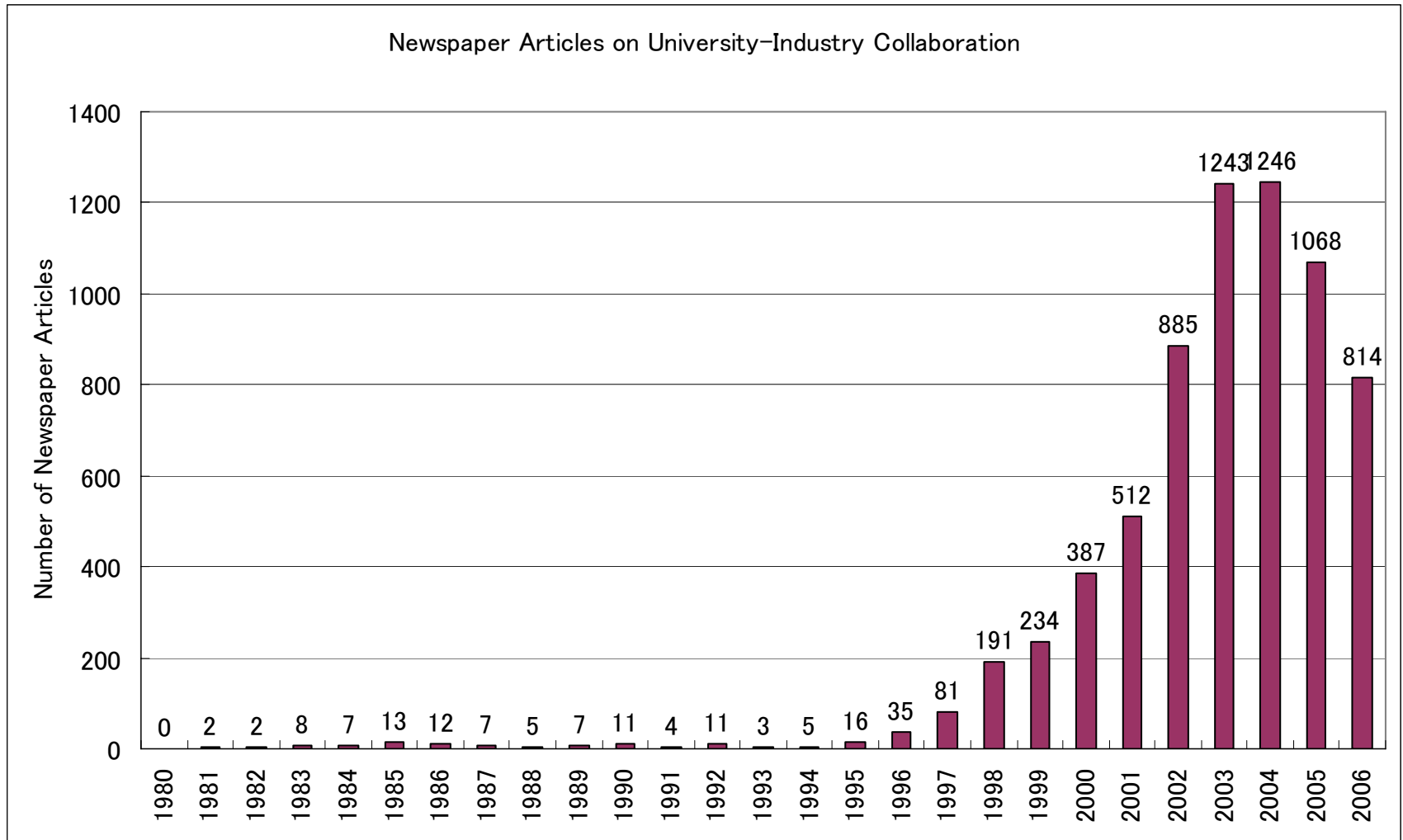
Overall

- Changing National Universities into National University Agencies
 - Autonomy
 - Both professors and clerks are no more civil servants.
- University Evaluation System

Background

- Decreasing budget and selective funding
- Decreasing young generation

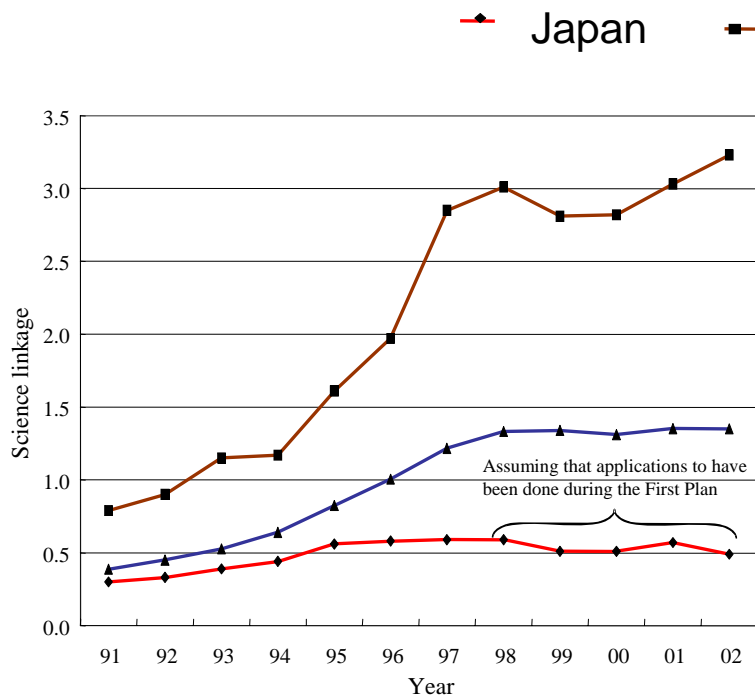
Decreasing Public Interests in Mere Collaboration



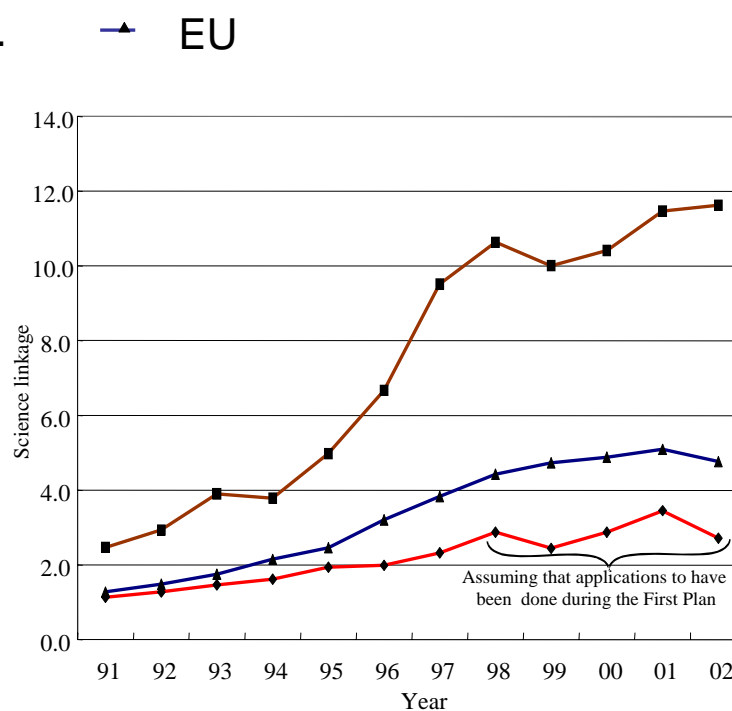
Source: The author retrieved the four NIKKEI newspapers using the keyword "University-Industry Collaboration".

Science Linkage in U.S. Patents

All Areas



Life Sciences



*: “Science linkage” is the number of cited scientific papers in the U.S. patent examination reports per registered patent. It indicates a frequency of the use of scientific knowledge among patents.

Data: CHI Research Inc. “International Technology Indicators 1980-2002”

Source: NISTEP

University Licensing (Japan-US Comparison)

	Japan	US	Ratios
R&D	3.3 trillion yen (in 2002)	5.4 trillion yen (in 2002)	1.6
Patent Application	1,680 (in 2003)	6,509 (in 2002)	3.9
Licensing Contracts	531 (in 2003)	3,739 (in 2002)	7.0
License Income	0.55 billion yen (in 2003)	145 billion yen (in 2002)	264
cf. Academic Spin-Offs	179 (in 2003)	364 (in 2002)	2.0

Source: The author calculated and tabulated using the data of NISTEP(2005) Study for Evaluating the Achievements of the S&T Basic Plans in Japan - *Highlights* – (in Japanese), NISTEP Report 83.

Forms of University-Industry Relation

- Joint Knowledge Creation
 - Joint research
 - **Joint Research Centers built by Companies on Campus**
 - Contract research
 - (Donation)

 - **Comprehensive collaboration agreement**

- Knowledge Transfer
 - Journal papers and books
 - Conference presentations

 - Via students
 - Graduating students
 - Internship in companies
 - Students sent by companies

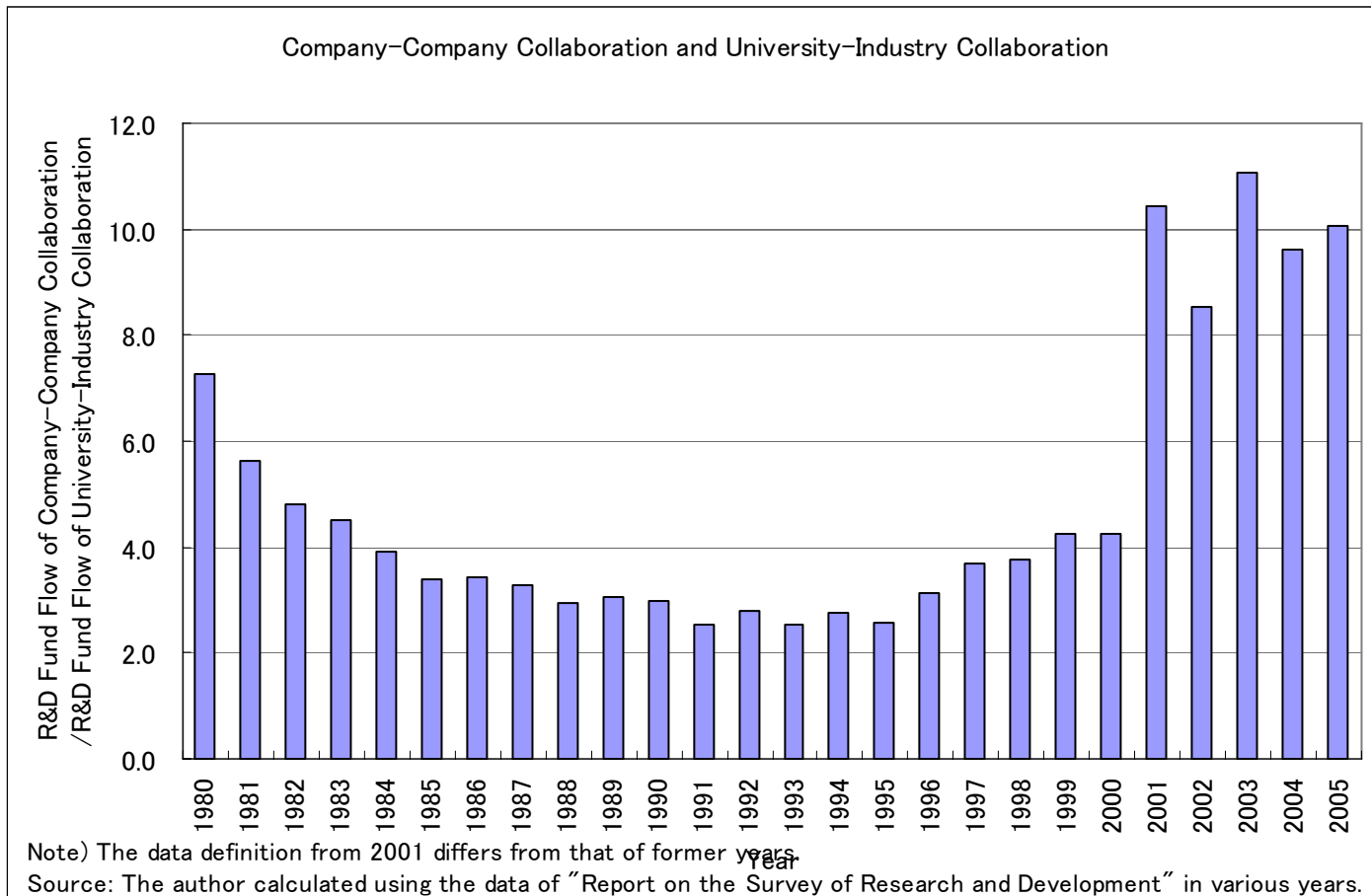
 - Consultancy
 - Licensing

- Knowledge-based Starting Up
 - University spin-offs
 - **Incubators built by Others on Campus**

Notes. 1. This classification is based on M. Kondo, Policy Innovation in Science and Technology in Japan –from S&T Policy to Innovation Policy– (in Japanese), *J of Science Policy and Research Management*, Vol.19, No.3/4, pp.132-140, 2004.

2. Facility and equipment usage is another form of partnership.

Company-Company Collaboration and University-Industry Collaboration



Policies including University-Industry Collaborative Activities

- Regional Innovation Policy
 - Knowledge Cluster Initiative
 - Industrial Cluster Program

- SME Promotion Policy
 - New Collaboration

Knowledge Cluster Initiative I

■ History

- Creating Knowledge Clusters was authorized in the Second S&T Basic Plan in 2001.
- The initiative, promoted by MEXT (Ministry of Education, Sports, Culture, Science and Technology), started with ten clusters in 2002. In 2005, the initiative is implemented in 16 clusters.

■ Objective

- To create internationally competitive knowledge-concentrated systems for technological innovation, paying proper attention to regional autonomy

Knowledge Cluster Initiative II

- Policy Supports for
 - Establishing headquarters
 - Hiring S&T coordinators as staff and mobilizing external experts such as patent attorneys
 - Conducting **joint research among universities, public research institutes and companies** at universities or so
 - Patenting and developing research results towards commercial use and
 - Holding seminars to present research results.

Industrial Cluster Program I

■ History

- The program, promoted by METI (Ministry of Economy, Trade and Industry), started with 19 projects in 2001.

■ Objective

- To realize endogenous regional economic development, through constructing innovation environment with a core of human network in regions

Industrial Cluster Program II

- Policy Supports for
 - Forming industry-academic-government networks
 - Promoting technological development using regional characteristics
 - Strengthening incubating functions
 - Marketing in cooperation with trading firms
 - Financing in cooperation with “Industrial Cluster Support Financial Forum”

Inter-industry Collaborative New Business Development I

- Members
 - SMES in different industries and
 - Universities, public research institutes, NPOs, etc.
- Duration
 - 3-5 years
- Requirements
 - A core SME exists.
 - Two or more SMES are involved and SMEs are the majority.
 - An agreement to clarify the roles of members exists.

Inter-industry Collaborative New Business Development II

- Procedure
 - A plan needs to be approved by METI Regional Bureaus.

- Assistance
 - Financial
 - Subsidies for formation
 - Subsidies for product development and marketing
 - Low-interest loans for factory construction and machinery purchase
 - Investment tax incentives, credit guarantees, reduced patent fees, etc.
 - Consultancy
 - Consultancy services provided by Regional Strategic Conferences before project application through the end of the project
 - Public announcement of approved projects
 - This announcement facilitates project members to get loans from commercial banks and to conduct marketing efforts.

Concluding Remarks

- The first stage goals are achieved in terms of:
 - The number of joint research,
 - The number of patenting and licensing agreements, and
 - The number of university spin-offs.
- The second stage goals are:
 - Visible benefits for the society and industry, and
 - Positive effects on university education and research.
- At the second stage,
 - university-industry collaboration policies are embodied in other policies, such as regional development policies and SME policies, as well.