

# To Promote University-Industry Research Cooperation and Knowledge Transfer - The Case of Japan -

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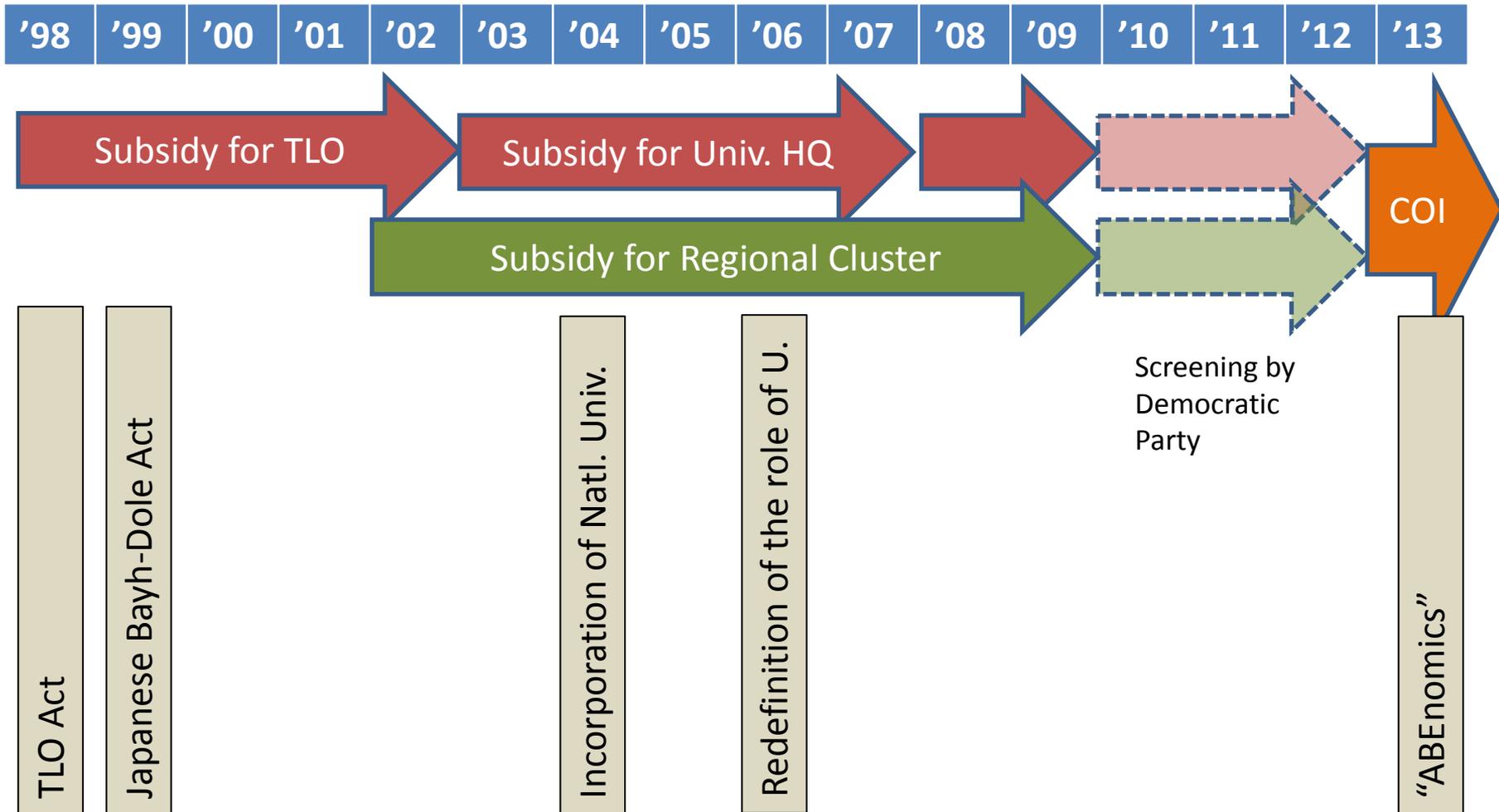
OECD Workshop on Assessing the Impact of Science, Technology  
and Innovation Policy Instruments with Common Objectives

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# Fifteen Years of Subsidies and Institutions for U-I Linkage in Japan



# Newly Introduced Institutions

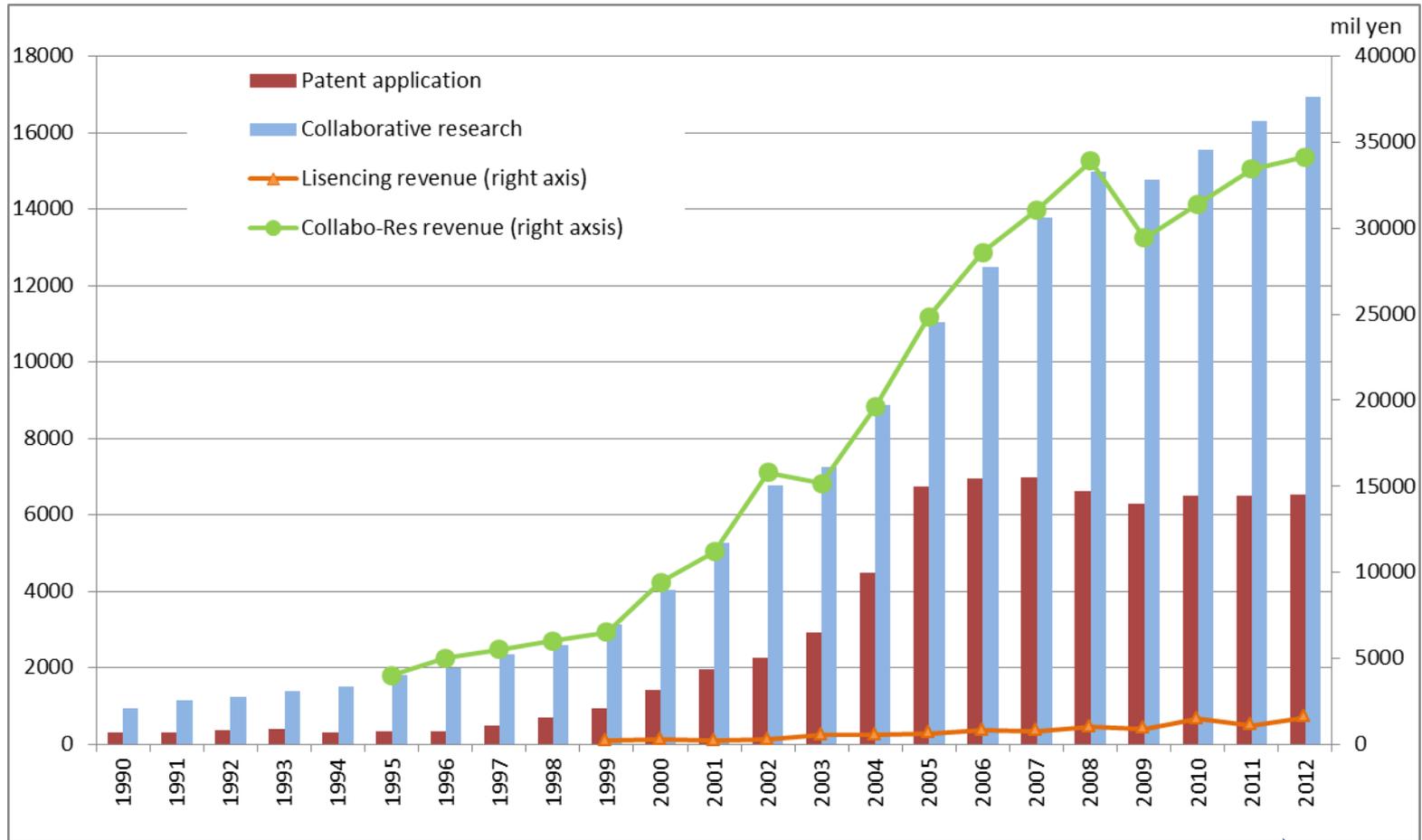
- TLO Act (1998)
  - To Establish Tech-Licensing Organization as an independent agent
  - In combination with
    - Patent law amendment (to reduce patent fee for TLO)
    - Subsidy and guaranty of liabilities (from METI and MEXT)
- Japanese Bayh-Dole Act (1999)
  - To give ownership of IPR resulting from government **contract research**
- Incorporation of National Universities (2004)
  - To give more autonomy and independence from the government
  - In combination with
    - Special purpose subsidy for IPR management
    - Claim of ownership and compensation rule of faculty generated inventions
    - Decreased block grant (general purpose subsidy)

# The Basic Assumptions

Overcoming underutilization stemming from the “Tragedy of the Commons”

- If an university has a ownership of invention,
- It will invest in;
  - Getting patent right, and
  - Licensing patent to industry, and
  - Encouraging faculties to invent more
- In order to;
  - Get an another financial resource, and
  - Disseminate technology

# What has happened?



TLO and Bayh-Dole

Natl. Univ. Incorporation

# Simple Observations

- The number of patent applications by universities has grown up to reach stable 7000 per year level after the introduction of TLO and Bayh-Dole
- Both the number of collaborative research contracts and the revenue for universities have been growing up throughout the 1990s and the 2000s (still growing)
- The revenue for universities from IPR licensing is far less than that from collaborative research
- Does ownership matters?

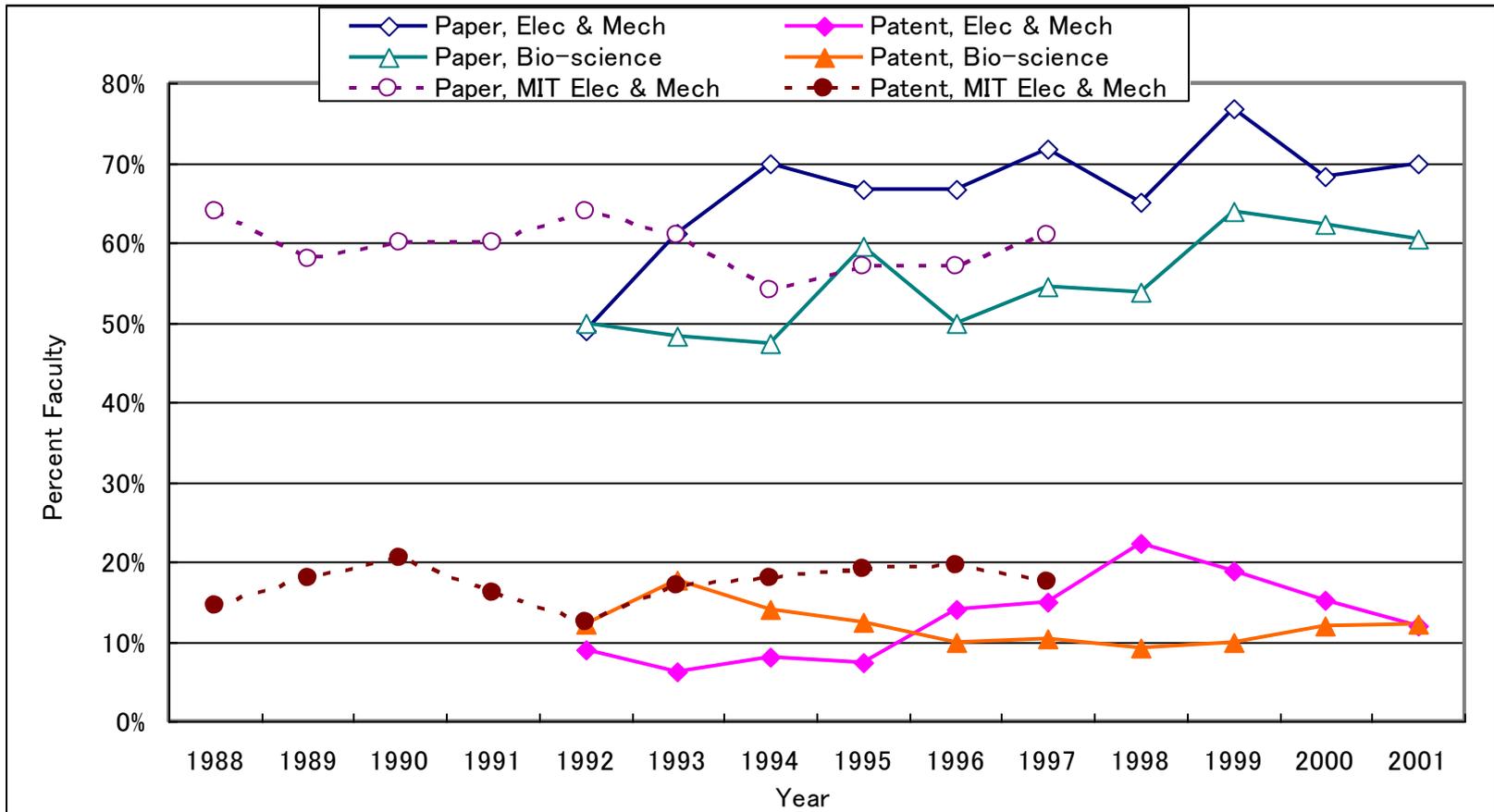
# Inconvenient Truth

## Example of typical “hidden” university patent ( Co-invention including faculties which was filed solely by a firm)

<p>【発行国】日本国特許庁(JP)          【公報種別】公開特許公報(A)          【公開番号】特許公開2001-152130          【公開日】平成13年6月5日(2001. 6. 5)          【発明の名称】光触媒性親水性部材、および、その製造方法          ……          【出願日】平成11年11月25日(1999. 11. 25)          【出願人】【識別番号】000010087</p>	
<p>【氏名又は名称】東陶機器株式会社          【住所又は居所】福岡県北九州市小倉北区中島2丁目1番1号</p>	Applicant (firm)
<p>【発明者】【氏名】宮内 雅浩          【住所又は居所】福岡県北九州市小倉北区中島2丁目1番1号 東陶機器株式会社内          【発明者】【氏名】下吹越 光秀          【住所又は居所】福岡県北九州市小倉北区中島2丁目1番1号 東陶機器株式会社内</p>	Applicant's employees
<p>【発明者】【氏名】重里 有三          【住所又は居所】神奈川県横浜市神奈川区六角橋5丁目11番16号          【発明者】【氏名】橋本 和仁          【住所又は居所】神奈川県横浜市栄区飯島町2073番地2ニューシティー本郷台D棟213          【発明者】【氏名】渡部 俊也          【住所又は居所】神奈川県藤沢市鵜沼海岸6丁目15番7号</p>	UT faculties
<p>…</p>	

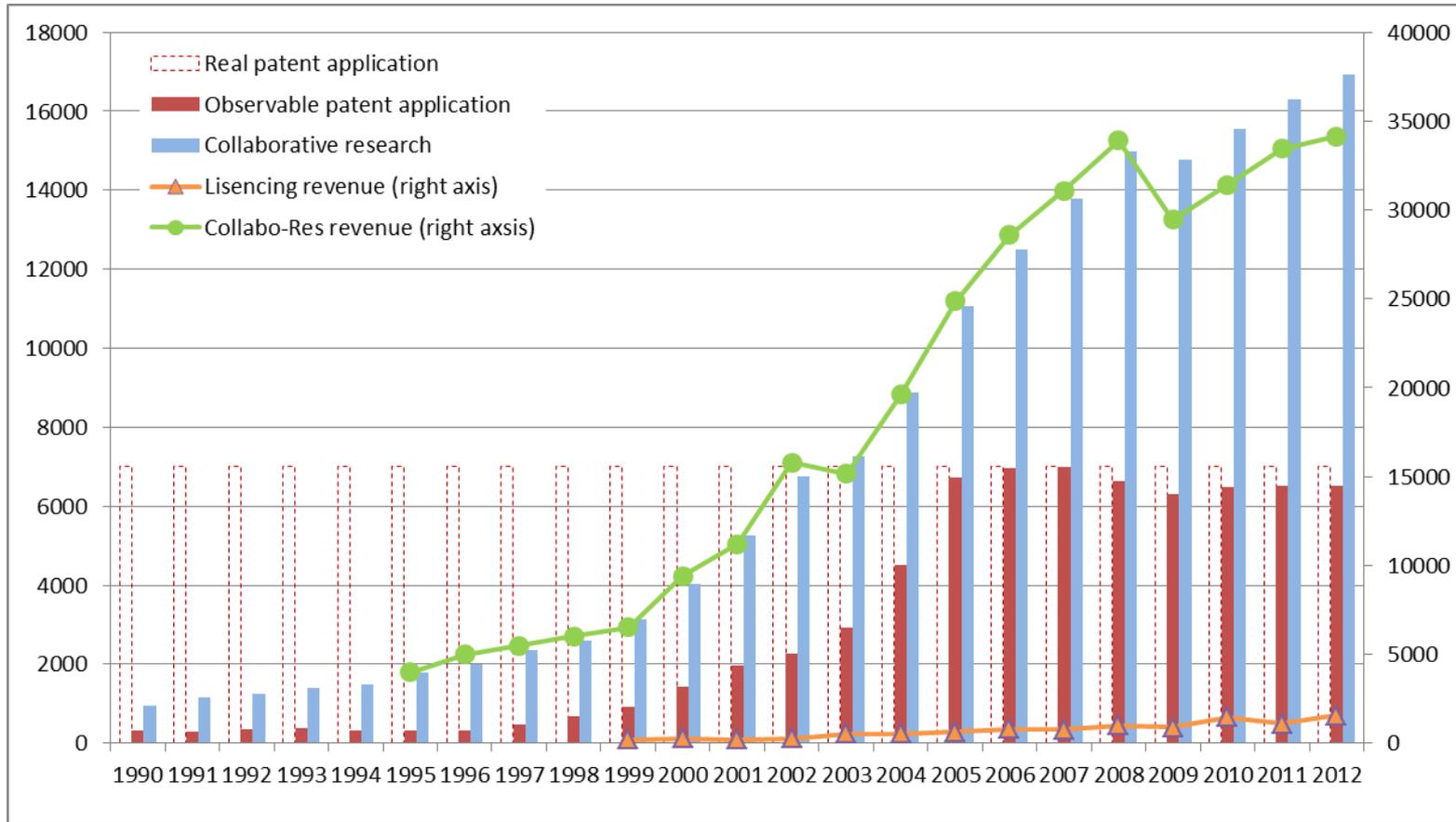
# The cases of University of Tokyo and MIT

The ratio of faculty that produces more than 1 publication or patent per year



- About 60% of faculties produce more than 1 publication per year
- About 15% of faculties produce more than 1 patent per year
- At both universities, these ratios are quite stable over time

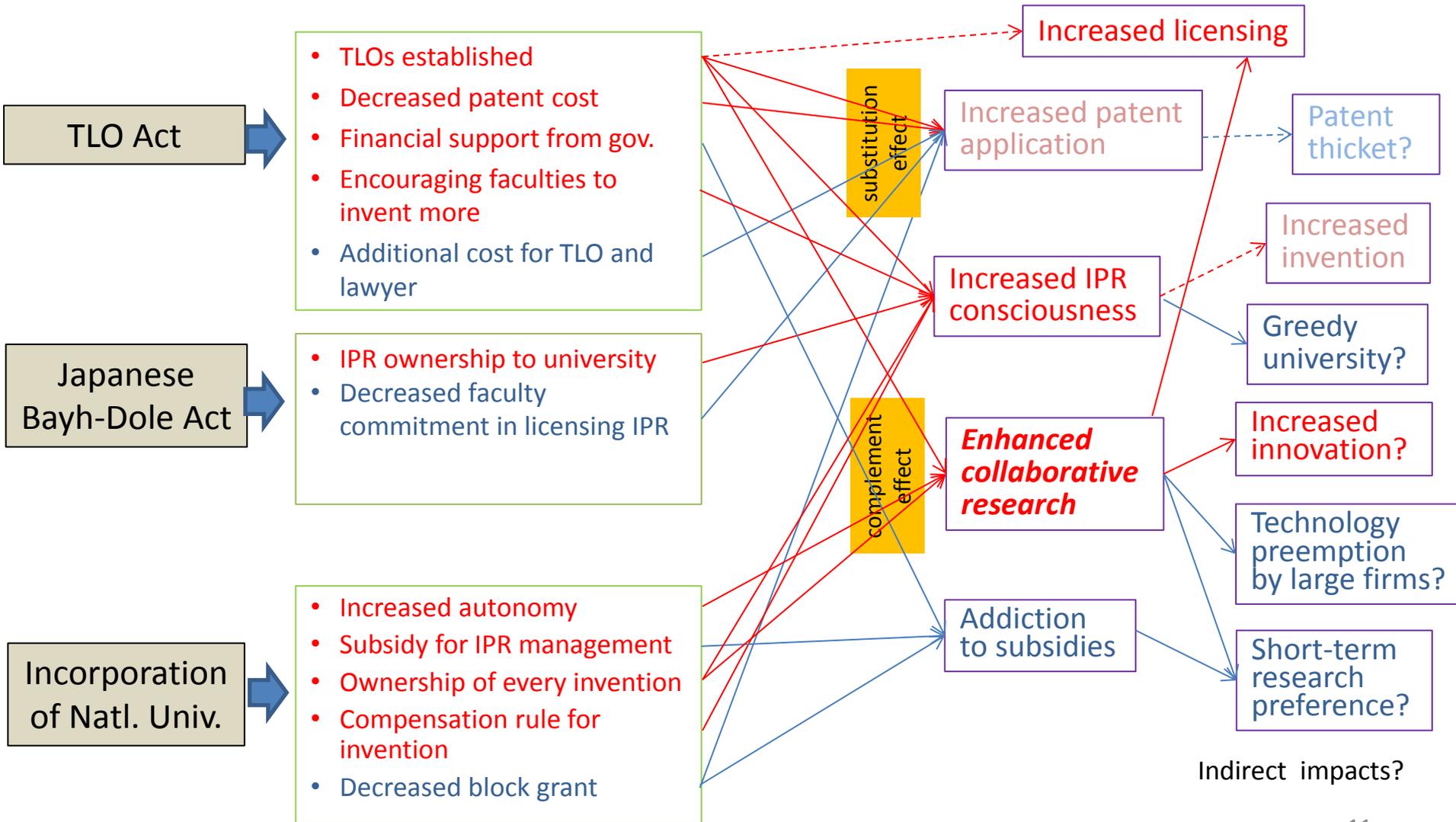
# Isn't this a real picture?



# Conclusions

- Possible “visualization” of formerly hidden inventions
- The total number of patents may be limited by the amount of budget
  - For most universities, TLO might become appear to be a cost center rather than a profit center?
- Faculties in general had not been strongly encouraged to invent more
  - They might have a natural motive to invent?
- In contrast, the rise of the collaborative research, which was unexpected, seems to be accelerated by the institutional change

# Collective Impacts of Institutions



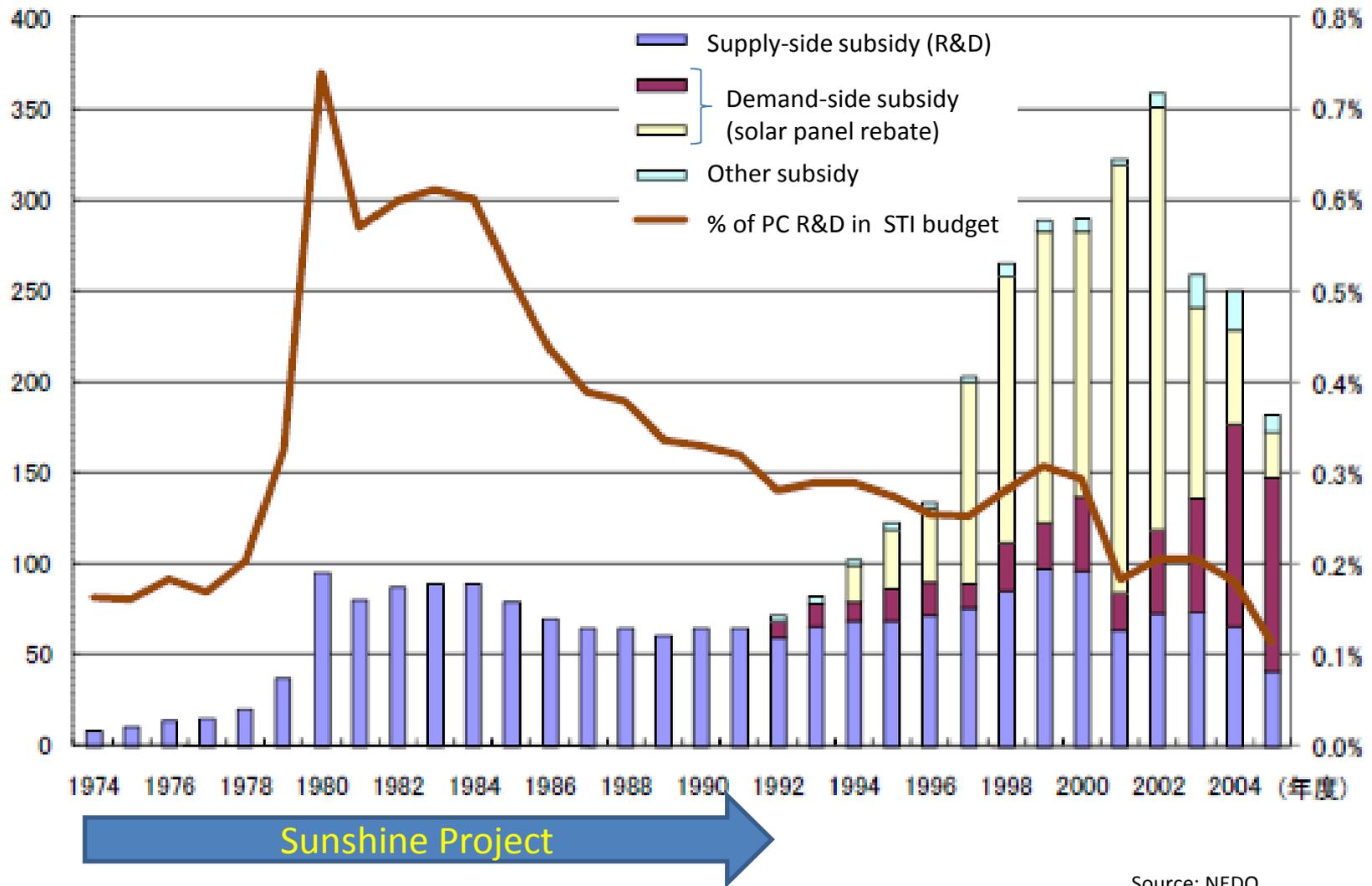
# Implications

- As for the collaborative research
  - Universities have better opportunities to enhance UIL by investing in the “collaborative research agents” rather than the “patent agents”?
  - The target of subsidy needs to be shifted?
- Too strong focus on university owned IPR might cause
  - Greedy university and faculty (BMW syndrome)?
  - Patent thicket (Tragedy of the anti-commons)?
  - Short-term research preference and technology preemption by large firms?

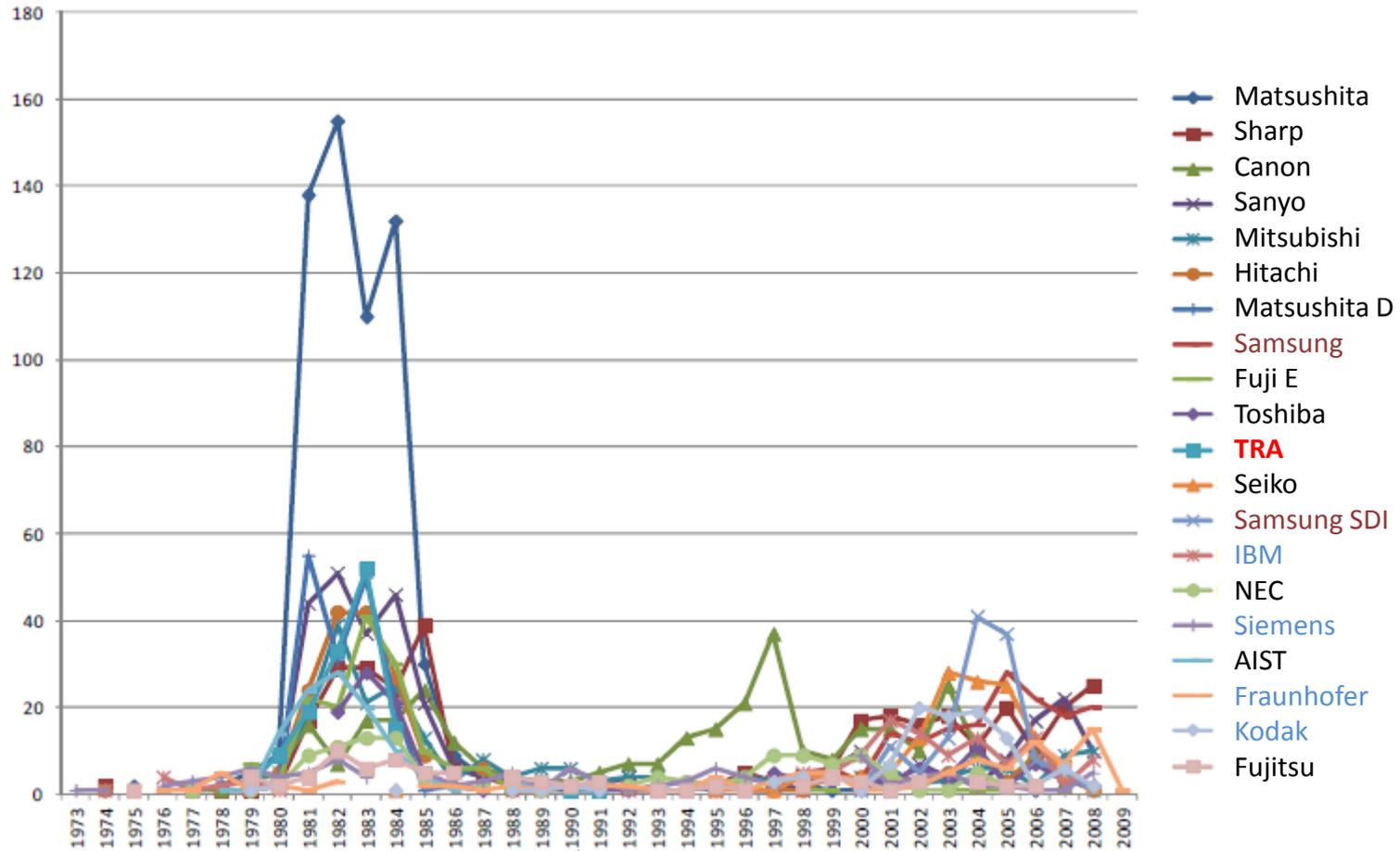
# Another Story

- The timing of the combination of supply-side and demand-side policies
- The case of MITI's "Sunshine Project"
  - Photovoltaic cell technology development
  - A typical targeting policy
  - AIST (government lab) + Tech-Res Association (consortium) + Industry

# Forty years of Photovoltaic Cell Technology Development in Japan

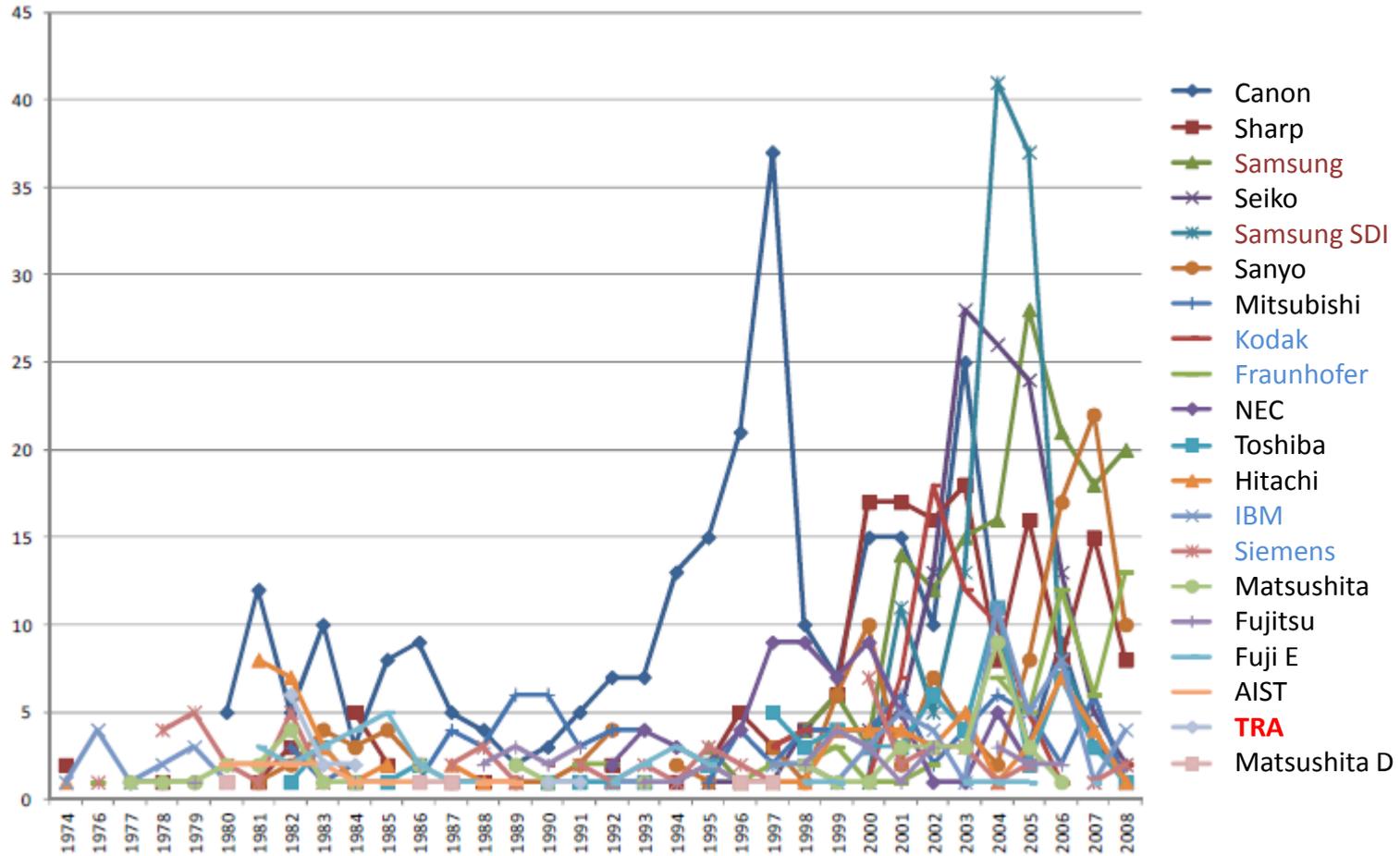


# Domestic PC Patent Applications in Japan



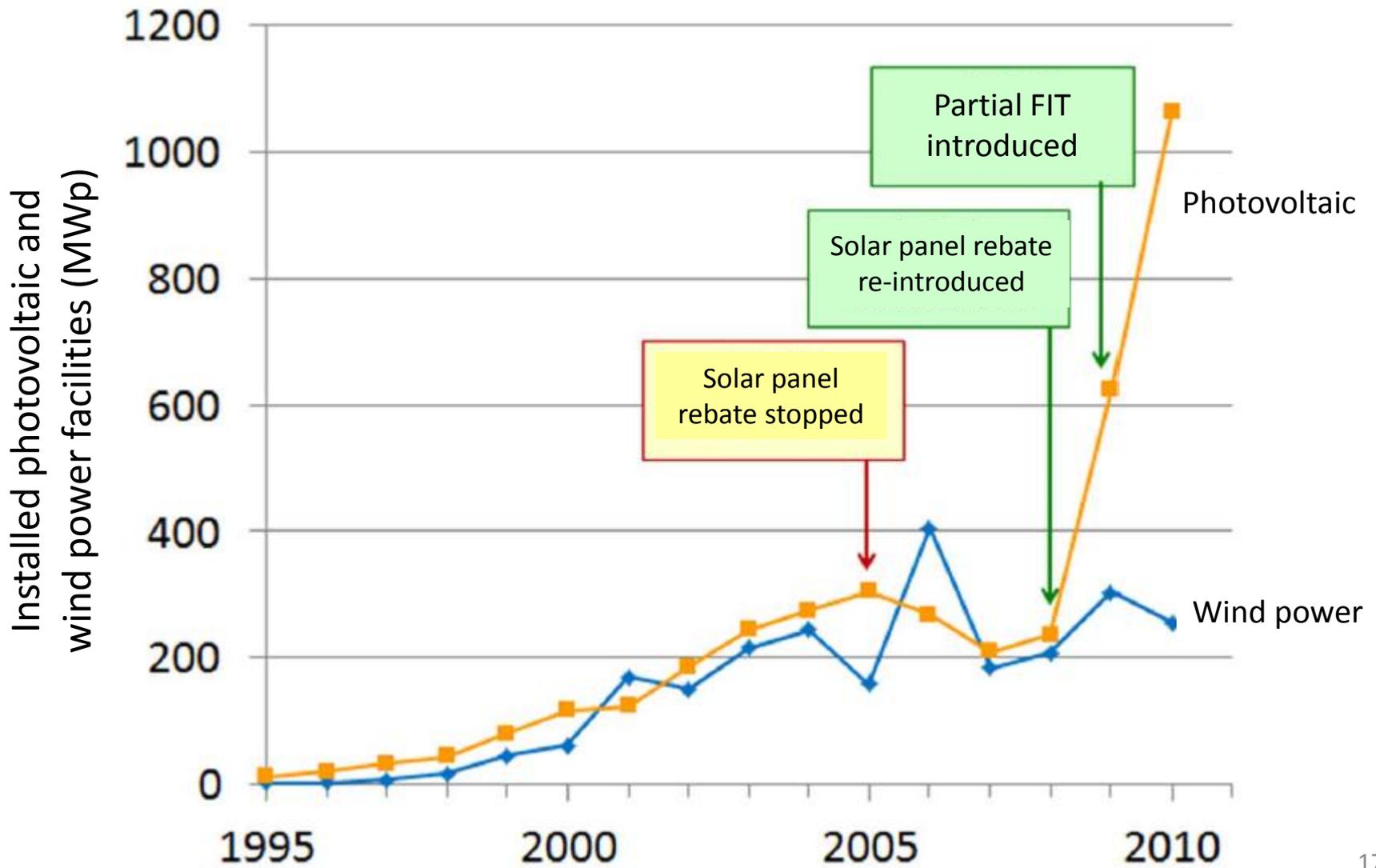
Sunshine Project

# International PC Patent Applications

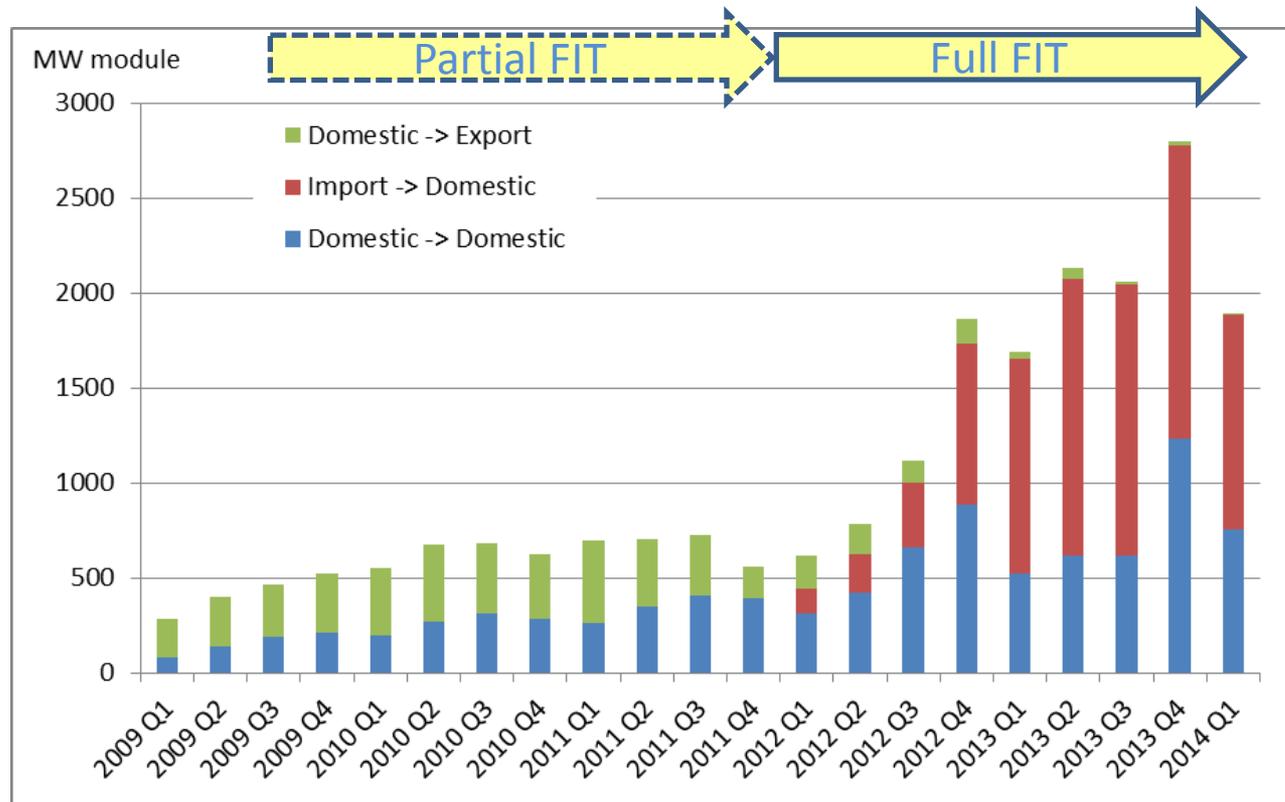


Sunshine Project

# Installed solar/wind power facilities in Japan



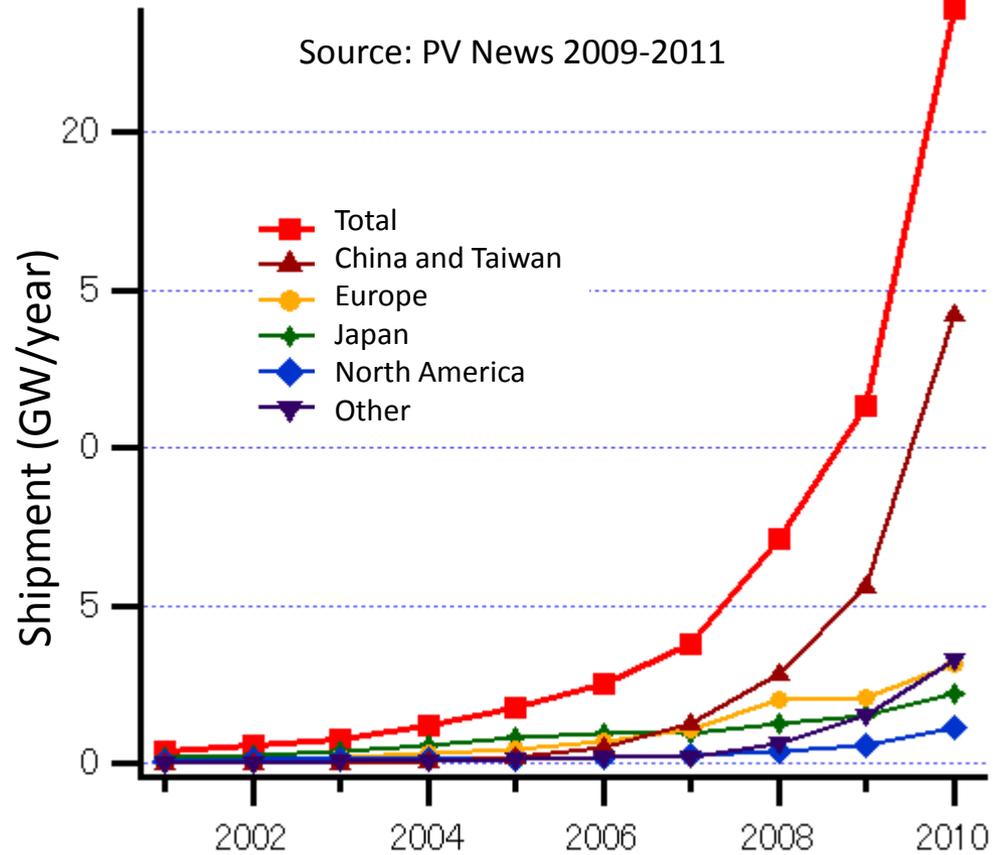
# Solar Module Shipment in Japan After the Introduction of FIT



Source: Japan Photovoltaic Energy Association

- Full FIT has mainly stimulated the import growth

# World Wide Solar Module Shipment



# Conclusions

- Japanese government had introduced a huge supply-side investment in the 1970s and 80s
- The public institute (AIST) had experienced a good research collaboration with industry at that time
- Japanese firms' technology had reached at the cutting edge level, but
  - They had applied many patents only in Japan
  - Japanese government had not introduced efficient demand-side stimulation
- Competitors have emerged in the 1990s and 2000s over the world
- They enjoy recently introduced demand-side policy very much
- The timing of the demand-side policy introduction (during the first mover advantage periods) matters