Regionalisation of Innovation and Science: A view from Japan

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STRUCTURE OF THE TALK

- *Regionalisation and decentralisation of Innovation and Science: A global agenda?*
- *Whither Cluster Policy ?*
- *Japanese experiences*
  - ***Regionalisation of innovation***
  - ***Cluster initiatives***
  - ***Financial Crisis***
- *Issues of measurement and regional capacity building*
- *What are the lessons from Japan?*

- **“Innovation” & “Cluster” becoming key policy issue**
  – US, European countries, Asian countries, …

- ***Academic (University)*** approach and ***Business approach*** to **Regional research policy** (Sanz-Menendez & Cruz-Castro, 2005)

- Innovation hotspots, InnoRegio, VINNVÄXT, Finish Centre of Expertise, BioRegio, Pôles de compétitivité, European Cluster Alliance…

“Innovation” & “Cluster”

Policy Convergence

Policy learning/

Emulation?

Organisational isomorphism?

- **Regionalization and decentralization in Europe**

  (Sanz-Menendez & Cruz-Castro), ***Regional Studies***, vol 39, n. 7, October 2005

- **Governance, Science policy, and Regions**

  (Perry and May, 2007) , ***Regional Studies***, Special Issue vol 41, n. 8, November 2007

- **Regions and science in France:** (Crepsy et al. 2007)
- **Co-evolution of national and local science arenas** in **Finland** (Sotarauta, 2007)
- **'Regionalisation'** of science and innovation policies and **limited MLG** in **Japan** (Kitagawa, 2007)

- **Internationalsiation** of Innovation systems (Carlsson 2006) ;
- '**Geography of science and innovation' to the Far East** (Edler, 2008)

REGIONALISATION AND DECENTRALISATION OF INNOVATION AND SCIENCE: A GLOBAL AGENDA?

Multi-level governance (MLG)

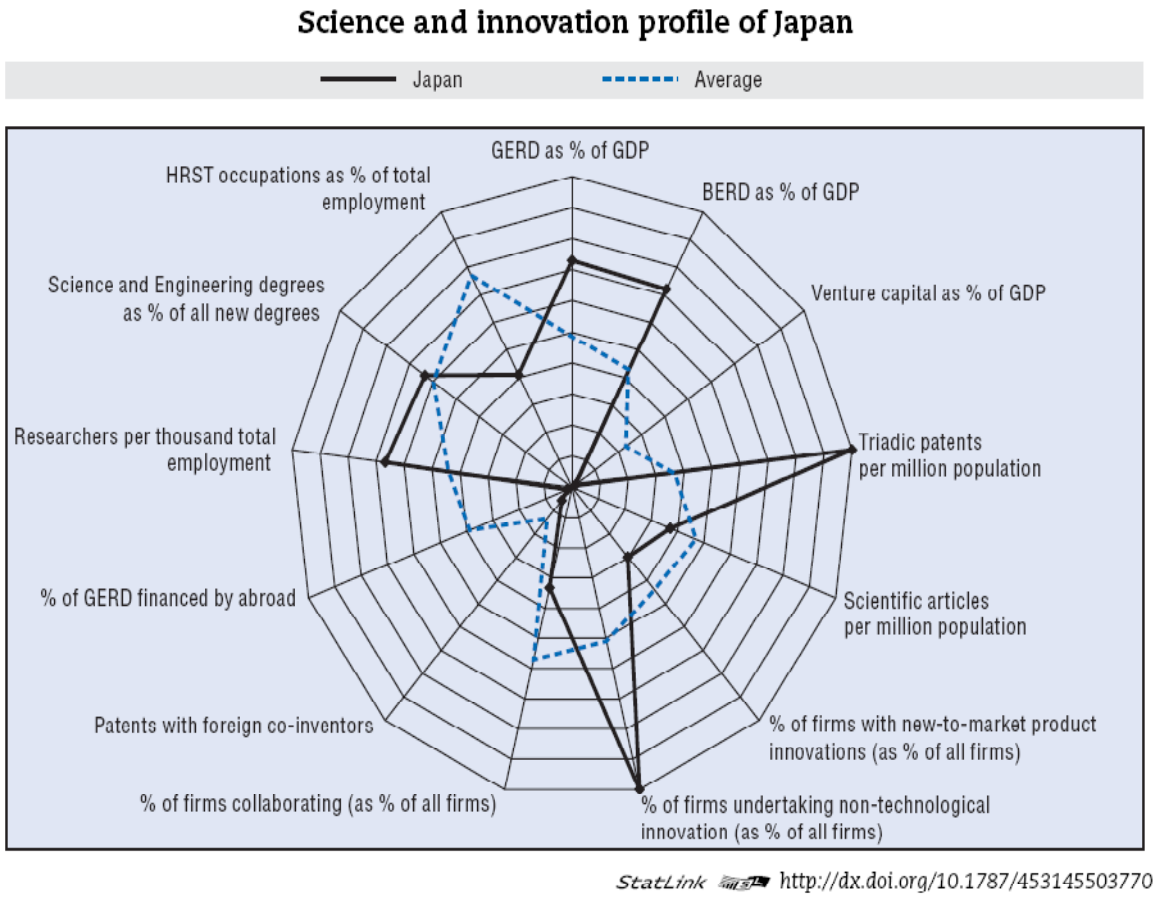
Between competition and equality

A VIEW FROM JAPAN

- The Changing Japanese **National Innovation System** (cf. Freeman, 1988)– changes from mid 90s to the present
- '**Science-based industries**' (Goto and Odagiri, 1997) ;
- External R&D collaboration; '**U-I links**', '**SMEs and networks**'(Motohashi, 2005)
- '**Regional innovation**' and '**Clusters**' as emerging key policy concepts
- New tensions – S&T policy reforms, organisational and institutional changes, evaluation .....**New governance mechanisms**?
- **Structural constraints** in the system (Shapira, 2008)

e.g. **Limited internationalisation and entrepreneurship**

A National Profile: Japan



StatLink http://dx.doi.org/10.1787/453145503770

Source: OECD

Key National S&T Policy Frameworks

- **1995** **Science and Technology Basic Law** enacted
- **1996–2000** **1st Science and Technology Basic Plan**
- **2001** Cabinet Office and Council for Science and Technology Policy (CSTP) inaugurated
- **2001–2005** **2nd Science and Technology Basic Plan**
- **2006–2010** **3rd Science and Technology Basic Plan**
- **2006** **Innovation 25**

Source: Yuko Harayama

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- **Science & Technology Policy**
  - The S&T Basic Law (1995)
    - Background
      - Economic recession ⇒ To legitimate investment in R&D
      - Government's agenda: "Nation based on the creation of S&T"
    - Implication
      - Toward a "National Policy"!
  - The S&T Basic Plans (5-year)
    - 1st BP(96-00), 2nd BP (01-05) , **3rd BP (06-10)**, & 4th BP ()

Cluster Policies initiated & implemented by
- •Ministry of Economy, Trade & Industry (METI): 2001-
- •Ministry of Education, Culture, Sport, S&T (MEXT): 2002-

Relation?

Innovation Policy initiated by
- •Council for S&T Policy (CSTP)

Implemented by
- •MEXT, METI, ・ ・ ・

Strategy for Regional S&T initiated by
- •CSTP

Development of 'Regional' Innovation Policies in Japan

- Incremental Developments in 1980s / ***Technopolis***
- **Science and Technology Basic Law** (1995); Activating Science and Technology Activities in Regions （1995); Industrial revitalisation law (1999)
- **Cluster initiatives** (2001), Second Phase - *Internationalisation* of Cluster 2007-
- ***Regional Activation Strategy based on S&T*** (CSTP, May 2008)

1. Strengthening Variety and Regional Management
2. Supporting the Gloabl S&T Centres

- **The First Basic Plan**
  - Support for local regional initiatives
  - Development of manpower and construction of an R&D infrastructure
- **Second Basic Plan**
  - Regional “Knowledge Clusters” & “Industrial Clusters”
  - Promotion of regional S&T policies
- **Third Basic Plan**
  - “Smooth” regional policies and coordinators
  - Regionally oriented research projects

Top-down Decentralisation?

Two Ministries : Two 'Cluster Strategies'

Figure 1 Industrial Clusters (Phase II 2006-2010) Source: METI

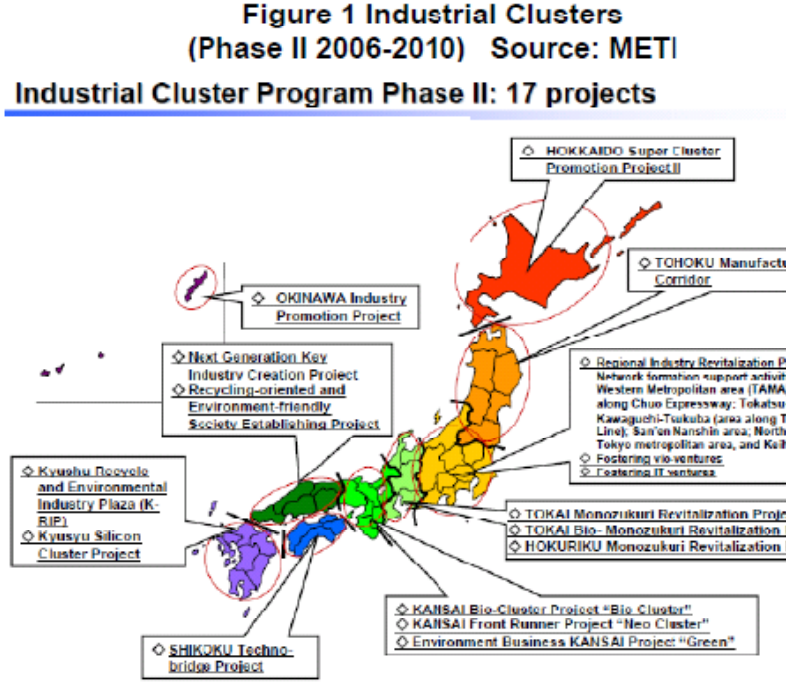
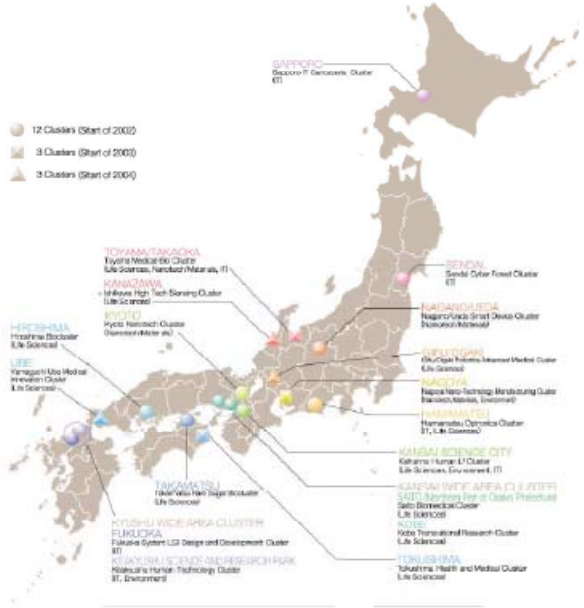


Figure 2 Knowledge Clusters Source: MEXT



	METI	MEXT
Phase I	**Launch** (2001-2005) •Formation & Expansion of Networks •On-the-ground experience of different schemes	**Launch** (2002-) •Preparation (2001) Conceptualization of "Cluster" & Identification of regions for feasibility study (→30 regions) Feasibility study lead by local authorities •Inducing local initiative
Phase II	**Development** (2006-2010) •Promotion of product commercialization & self-sustaining networks •On-the-ground experience of different schemes	**World class clusters** (2007-) •More selective •Local authorities' enrollment ↑ Matching-fund •Inducing synergy with other initiatives •Global dimension
Phase III	**Growth** (2011-2020)	?

	METI	MEXT
"Region"	National territory divided into 9 blocks (METI regional bureaus)	Localities (local authorities)
Target	•Developing innovation friendly business environment •New business ↑	Forming regional cluster: •World-class innovative clusters •*Medium-size clusters (City area program)*
Design	METI's regional bureaus' vision → Proposal for Industrial cluster program	Local government's cluster vision →Proposal for the Knowledge cluster initiative
Approach	•Networking & Promoting collaboration (cross-sectoral & University-Industry-Government) •Implementing incubators •Exploiting regional resources	•Conducing joint research •Promoting business development •Promoting cross-regional collaboration (expansion program)

Source: Yuko Harayama

Complement,

in competition,

toward ***coordination or integration?***

Budget of two Cluster Programmes

	1st Stage	2nd Stage
Industrial Cluster project (METI)	1.5bn JPY pa (2005) (2001-2005)	1.2 bn JPY pa (2008) (2006-2010) ; Regional Innovation Programme 11bn (2008)
Knowledge Cluster (MEXT)	Apprx.500m JPY pa/region (2002-2006)	Apprx. 500 m-1bn JPY pa plus JPY pa /region (2007-2011)

Source: Woolgar and others

Government Funding for COEs and Clusters

- The World Premier International Research Center Initiative
- Innovation Centres for fusion of Advanced Technologies
- Program to Develop Strategic Research Centres (Super COEs)
- 21 Century COEs
- Global COEs

- Knowledge Clusters 1st /2nd stage
- City Area Ind-Uni-Gov Cooperation fund
- Industrial Clusters 1st and 2nd stage

- CRESTO, ERATO...

Source: Sternberg, 2008

Source: Yuko Harayama

POSITIVE OUTCOMES

SOME INDICATORS AND MEASUREMENTS

Achievements of Industrial Cluster Programs

Total budget of \7.5 billion (2001-2007)
contributing to total sales of about \40 billion

Approximately five times the cost-benefit performance!

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[2007 annual performance]
- Participants at business confab events: 165,000 persons
- Individual business meetings: 14,300
- Company visits and researcher visits: 65,000
- R&D budget adopted at industrial cluster-related businesses: \12.9 billion
- E-mail publication subscribers: 73,000
- Access to websites: 5.7 million hits (5,800 hits per support organization)

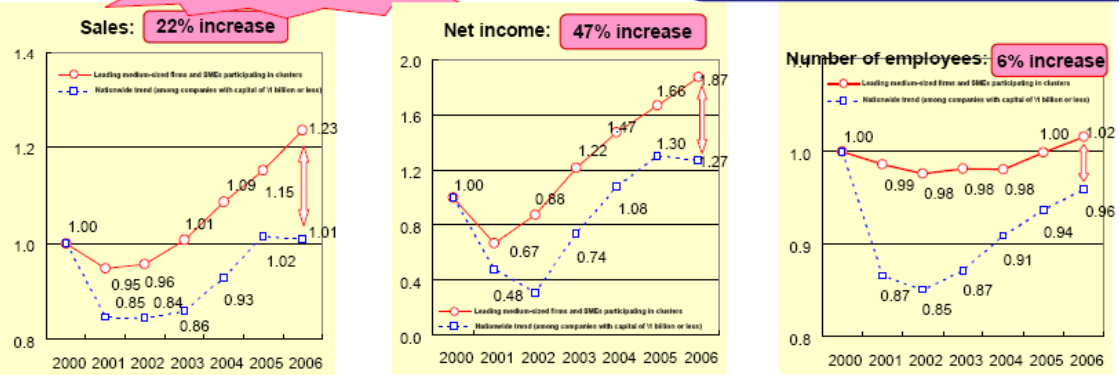
University ventures (2006)

Participating university ventures: 425 (1590 in total)
IPO companies among them: 13 (19 in total)

Result of monitoring survey (2007)

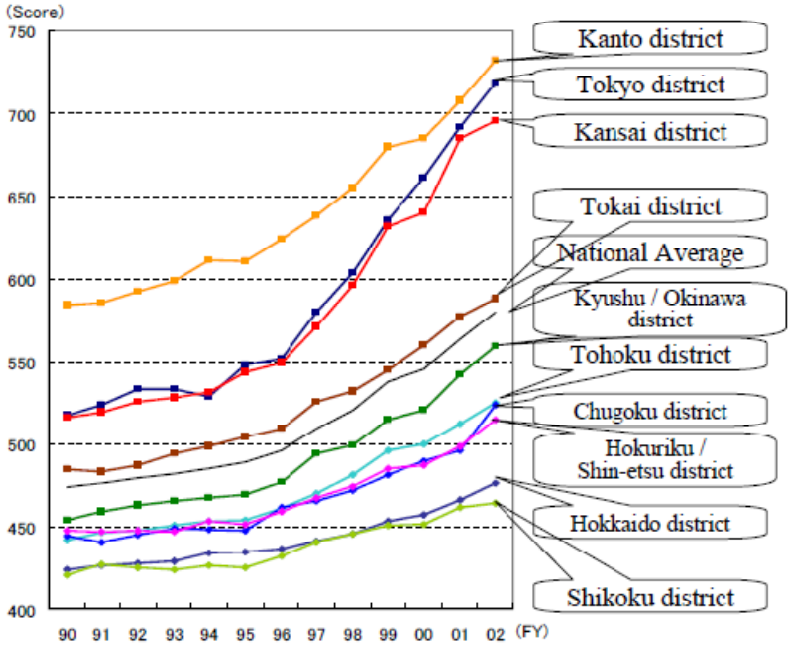
- Degree of satisfaction: 62.4%
- Degree of expectation: 73.9%
- Wide-range cooperation or cooperation with businesses or research institutes: 29.9%
- Launches of new products or services: 21.0%

Successful cases/technology transfer: 2,219 cases



Source: METI

Source: NISTEP

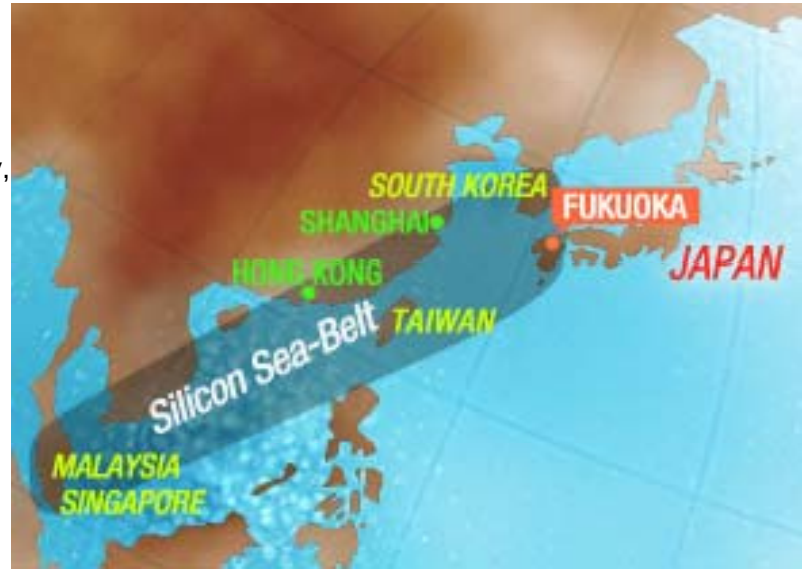


Ranking by Increase 1990-2002		Ranking by Total Score in 2002	(Reference) Ranking by Population
1	Tokyo district	(2)	5
2	Kansai district	(3)	2
3	Kanto district	(1)	1
4	Kyushu / Okinawa district	(5)	4
5	Tokai district	(4)	3
6	Tohoku district	(6)	6
7	Chugoku district	(7)	8
8	Hokuriku / Shin-etsu district	(8)	7
9	Hokkaido district	(9)	9
10	Shikoku district	(10)	10

GROWING DISPARITIES BETWEEN REGIONS?

The Silicon Sea Belt Zone

- Semiconductor belt zone in Asia ranging from South Korea to Kyushu, Shanghai, Taiwan, Hong Kong and Singapore – Fukuoka Prefecture
- nearly 50% of all semiconductors produced globally, and this growth is expected to continue.
- **Sony LSI Design Inc. Logic Research Co., Ltd. JM Technology Inc. Aldete Corporation**
- **Semiconductor Technology Marketing (STM)**
- **Institute of System LSI Design Industry, Fukuoka**



The aim of Cluster Policy

– Supporting regions to become “cluster”

– Industrial agglomeration

To become a “Center of Excellence” in a specific industrial sector– Or/and Innovation hub

To equip region with capacity to generate new ideas, incubate, design, & translate them in terms of business model– Or/and Innovation eco-system

To become *a self-evolving region through learning process*

Challenges and questions

- Keys for assessment– Return on investment?
- Who’s competency? (Central government versus Regional government or Private sector)
- Priority setting in S&T policy
- Region: Need for a self- assessment & capacity building

WHITHER CLUSTER POLICY?

AIMS, IMPACT, ASSESSMENT AND MEASUREMENT

Some Thoughts

- Policy experimentation and local flexibility vs Standardised and coordinated approach
- Performance measurement and assessment – how to **accumulate learning?**
- **Human resource strategies at regional level?**
- **Decentralisation and the level of autonomy**
- **'Ownership' of Regional Innovation Strategies?**

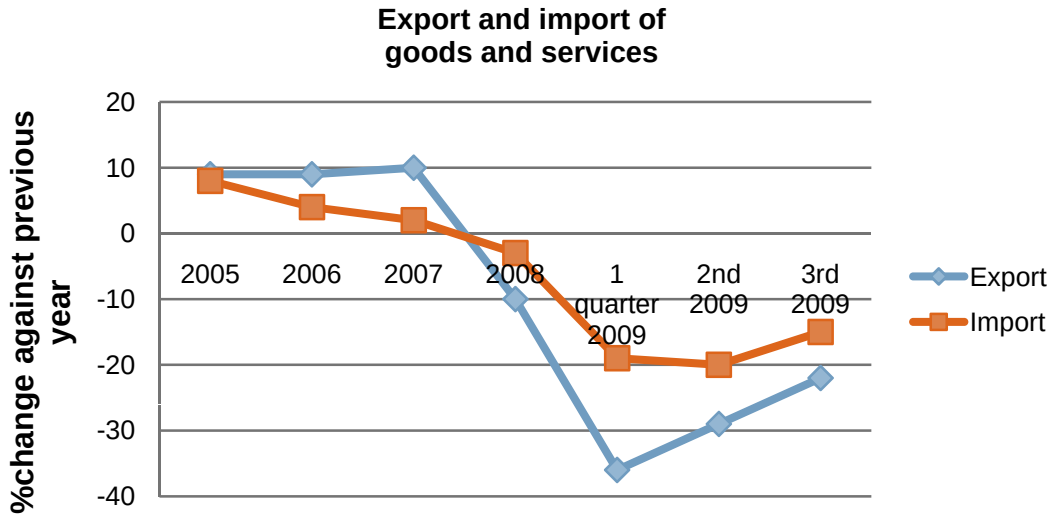
- Short-run (static) effects and long-run (dynamic) effects of public and private R&D (Nishimura and Okamuro, 2010)
- Geographical effect of university R&D on innovation (e.g. Acs et al 1992, 1994; Feldman, 1994; Jaffe, 1989; Arundel and Geuna, 2004; Lausen et al. 2008)
- Capability of delivering knowledge transfer activities (Hewitt-Dundas et al 2007)
- Network dynamics (Powell and White 2005; Sakata et al. 2006)
- Global model of 'the triple helix' interaction (Etzkowitz, 2002)

WHAT ARE THE IMPACTS? SPATIAL/ ORGANISATIONAL/ SYSTEM CHANGES?

Impact of *financial crisis* on Japan's national economy

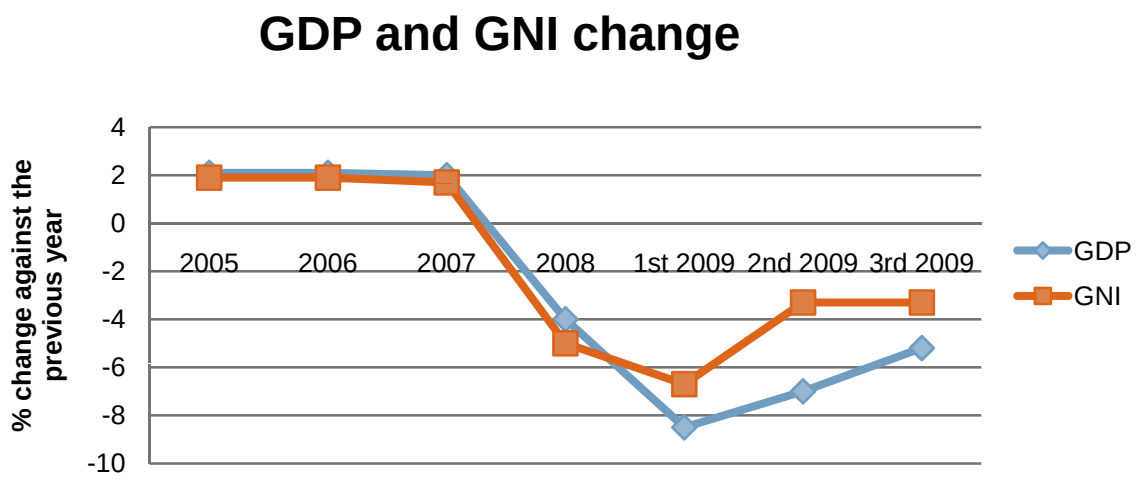
- Export and industrial production fell significantly
  - Financial impact
  - Impact on the real economy
  - Impact on employment
  - Rising exchange rate against US$
- Real GDP growth rate and GNI growth rate had a sharp drop from 2007 to 2009
- **Severe national budget deficit**

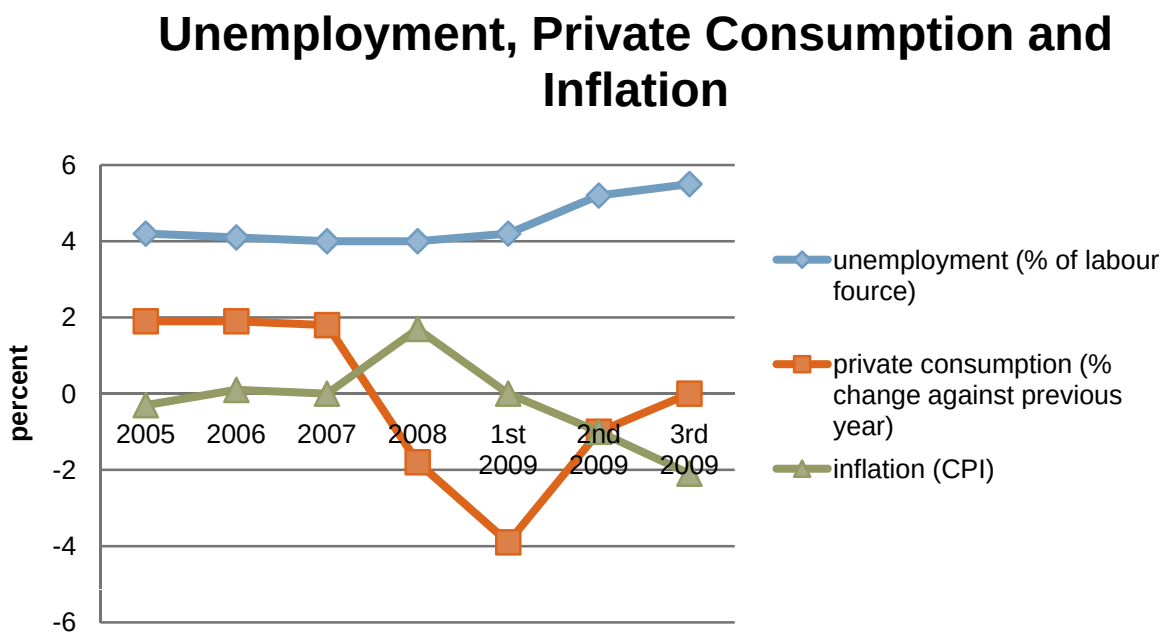
- **Decline in exports & imports of goods**



Source: Cabinet Office (2009) and others

- **GDP and GNI Change**




Unemployment, Private Consumption and Inflation
percent
6
4
2
0
-2
-4
-6
2005
2006
2007
2008
1st 2009
2nd 2009
3rd 2009
unemployment (% of labour fource)
private consumption (% change against previous year)
inflation (CPI)

What can we Learn from Japanese Experiences?

- *New National and Regional Innovation Systems?*
- Times of Crisis - connecting the macro (framework), micro (industry, organisations) and meso (regional clusters etc) levels
- What is the optimal level for policy implementation and governance, for both *technological* and *social innovation* and local and regional development?
- International emulation of STI policies, and; US-Japan policy learning experiences; European –Japan links
- Links with Asia and beyond through Clusters, human mobility and technological and financial linkages – role of local government?

Science and Innovation landscape in East Asia

(China, Taiwan, Singapore, South Korea and Japan)

THANK YOU!