Session 2: Interaction between Technological Innovation and Policy

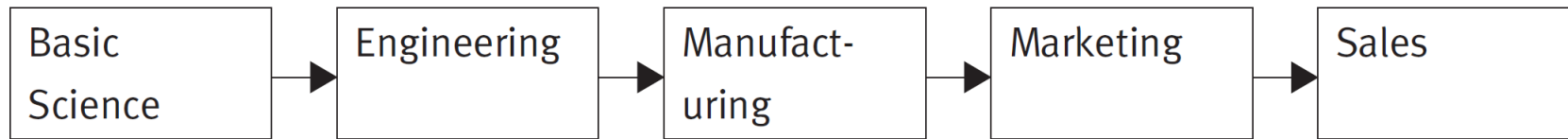## Theme 1: Best Practices in Innovation Policy

| Basic Science | → | Engineering | → | Manufact-uring | → | Marketing | → | Sales |

- Policy → Vannevar Bush, 1945
  - After WWII, US needs to do basic research
    - HR pipeline – trained scientists
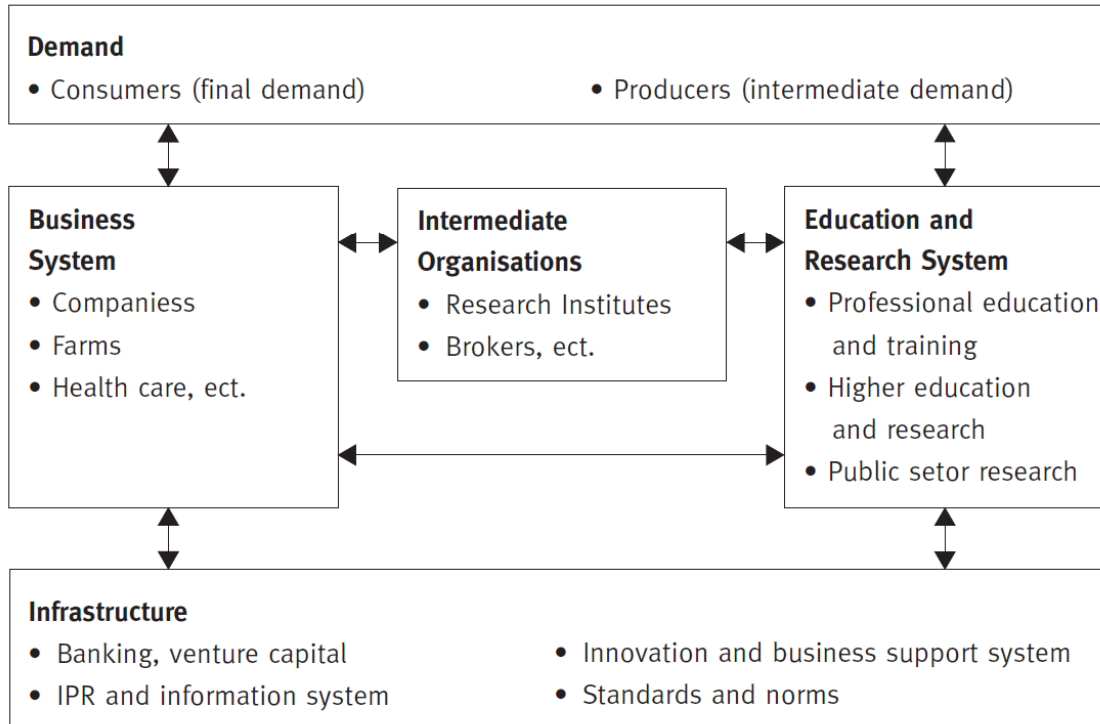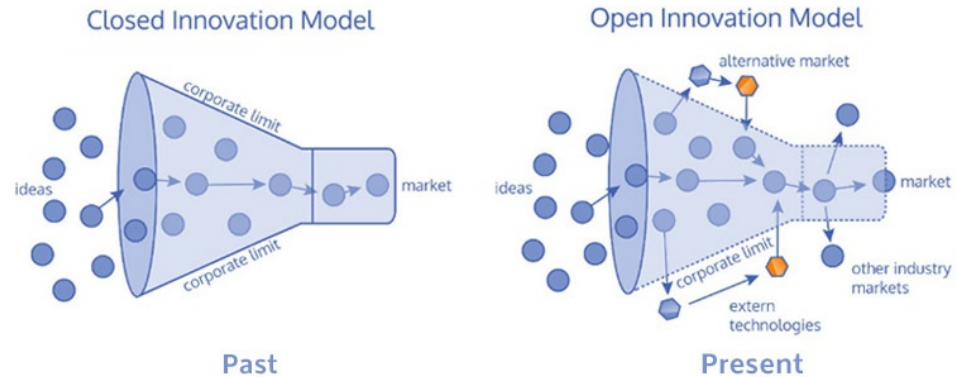   - Grants & scholarships

- source: Arnold & Bell 2001

Closed Innovation Model / Open Innovation Model

Major Components of a National Innovation System

Framework Conditions

- Financial environment
- Taxation and incentives
- Propensity to innovation and entrepreneurship
- Trust
- Mobility
- Education, literacy

Demand
- Consumers (final demand)
- Producers (intermediate demand)

Business System
- Companiess
- Farms
- Health care, ect.

Intermediate Organisations
- Research Institutes
- Brokers, ect.

Education and Research System
- Professional education and training
- Higher education and research
- Public setor research

Infrastructure
- Banking, venture capital
- IPR and information system
- Innovation and business support system
- Standards and norms

- Open Innovation → Utilizing external licenses/patents.
  - In Japan?
- Innovation Systems
  - **Network** flow of tech, info
  - **interactions** between **actors** - people, enterprises, institutions
  - Nation, Region, Sector…
  - Innovation Networks
    - E.g. Clusters
- Different Lens ⇔ Different Policies

- What are the best practices in innovation policy around the world?

  - Why?

- Examples from the EU and US?

Session 2: Interaction between Technological Innovation and Policy

Theme 2: Innovation in Japan

Japan's National Innovation System?

Demand

Framework Conditions

Industrial System

Education and

Political System

Naively try to fill in for Japanese NIS

Sources
Freeman 1987
Nelson 1993
European Commission 2008
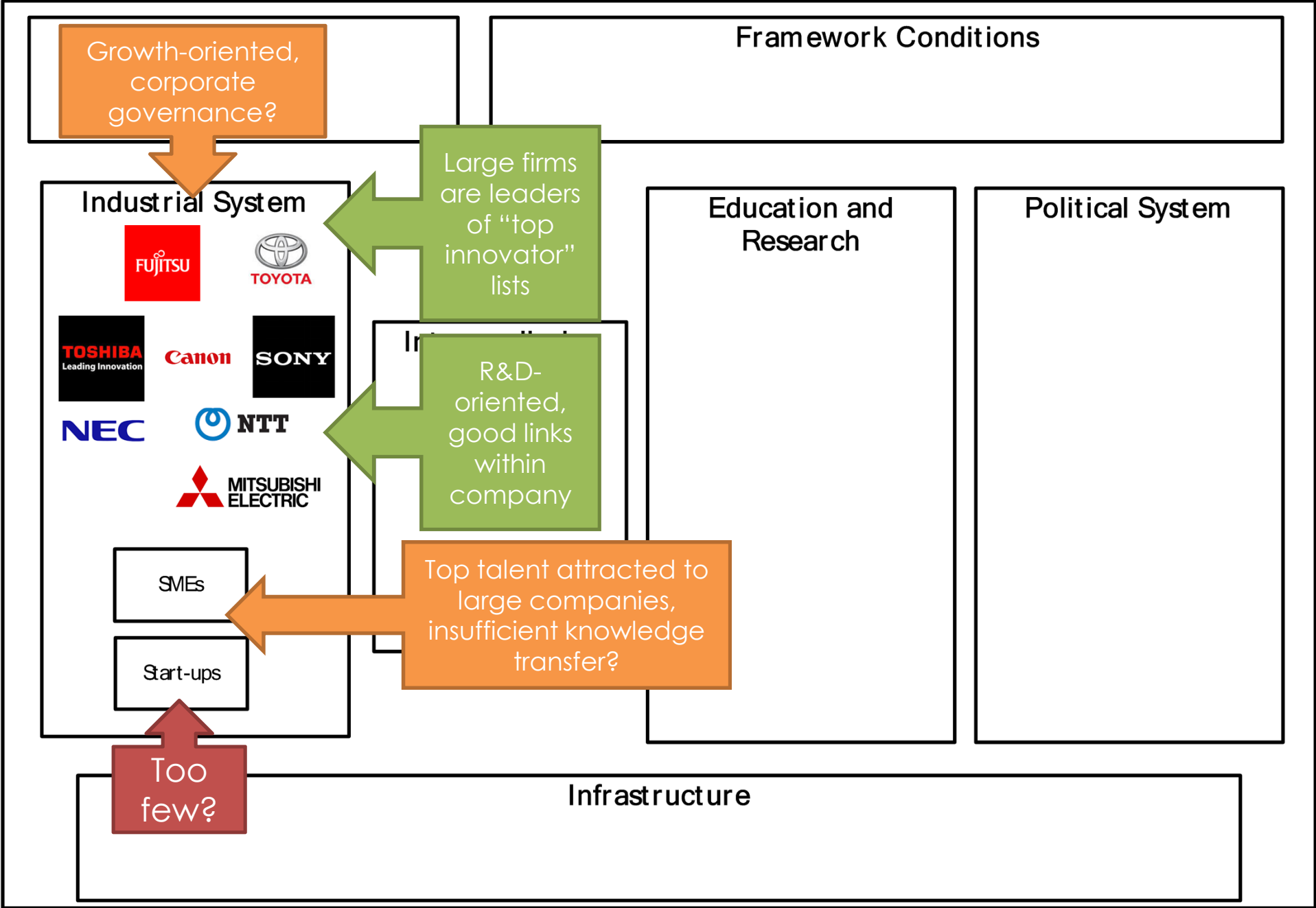Reuters "most innovative" 2016
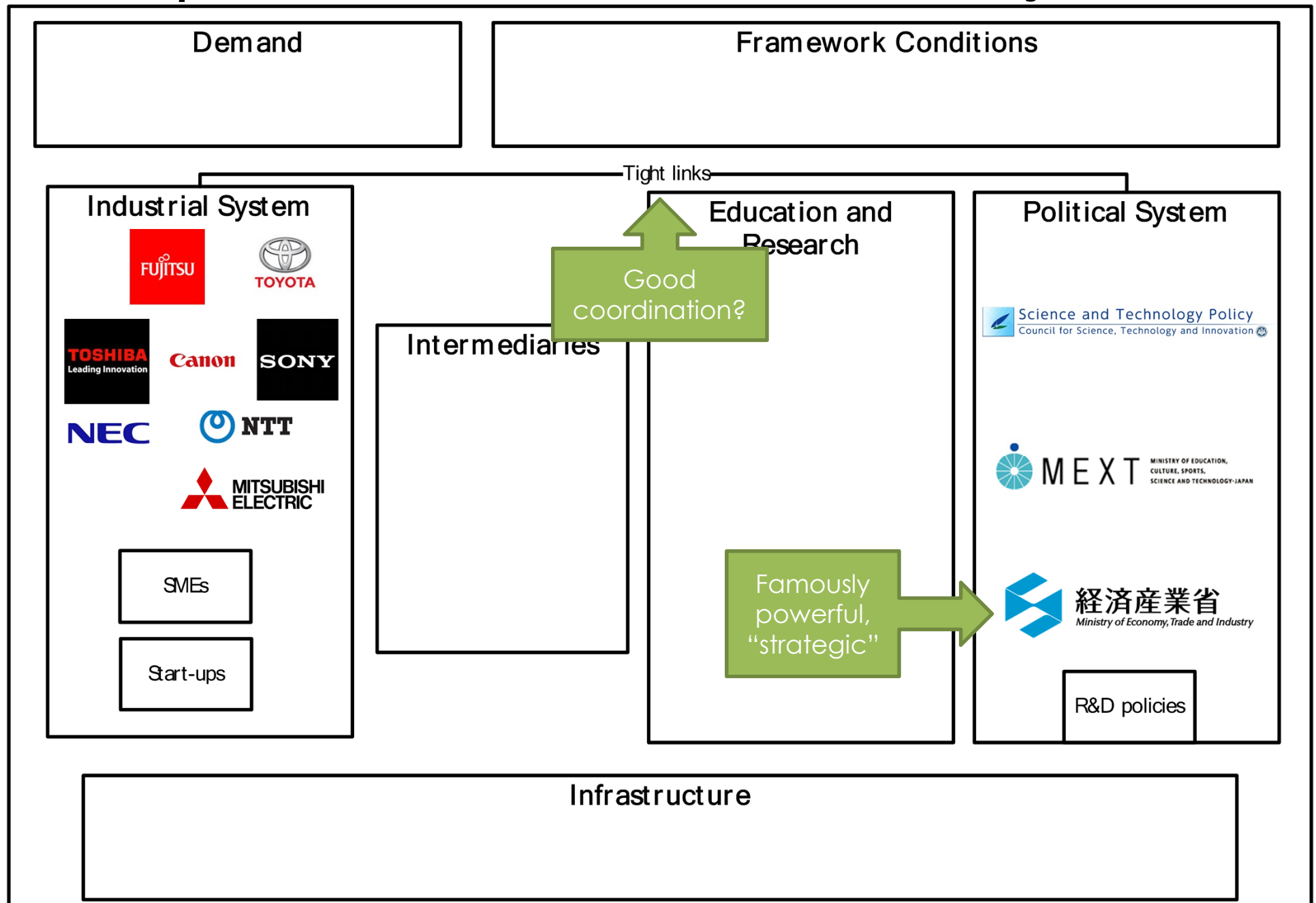METI, MEXT interviews 2017
Lecture notes 2016
Subjective impressions…

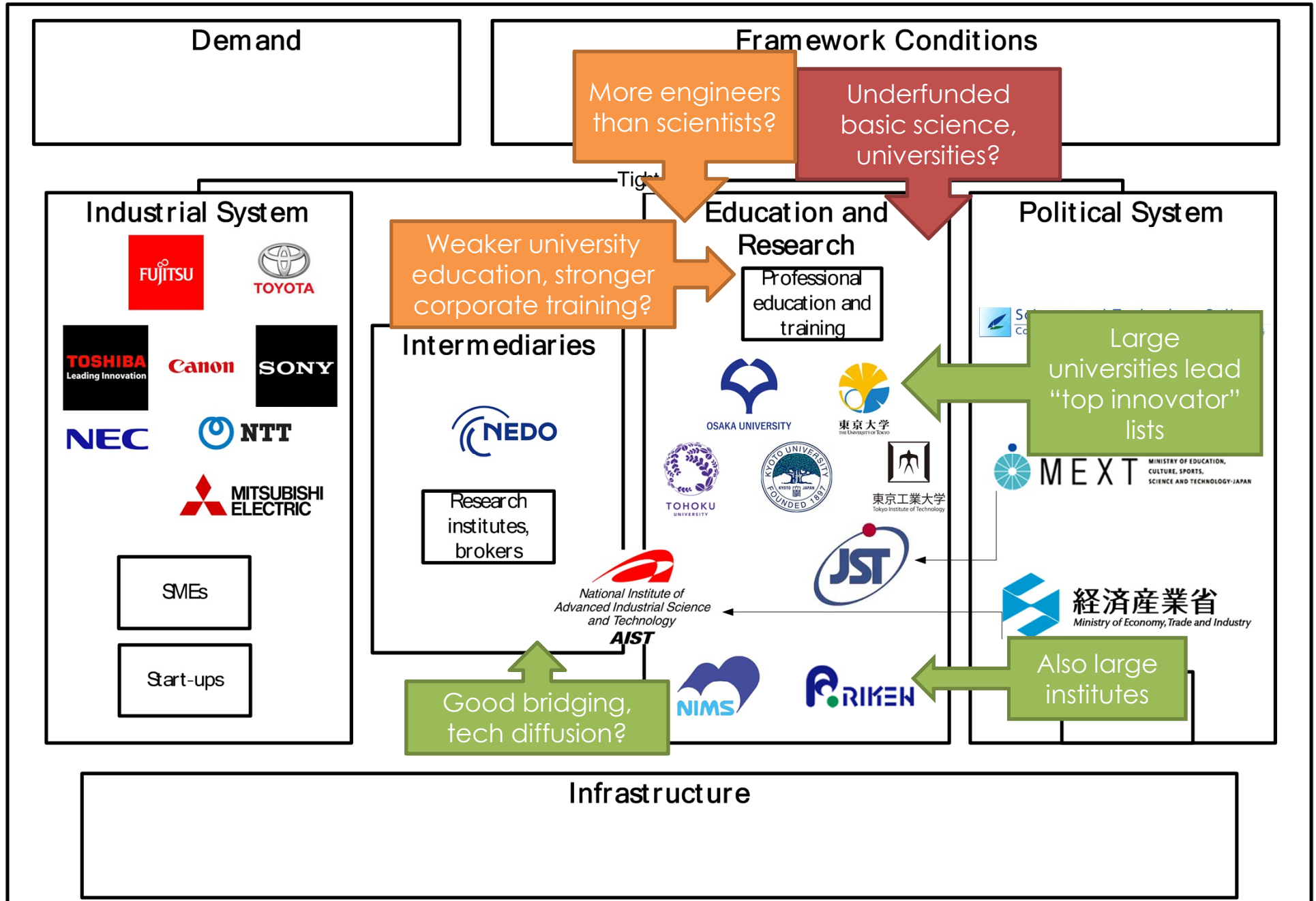**Infrastructure**

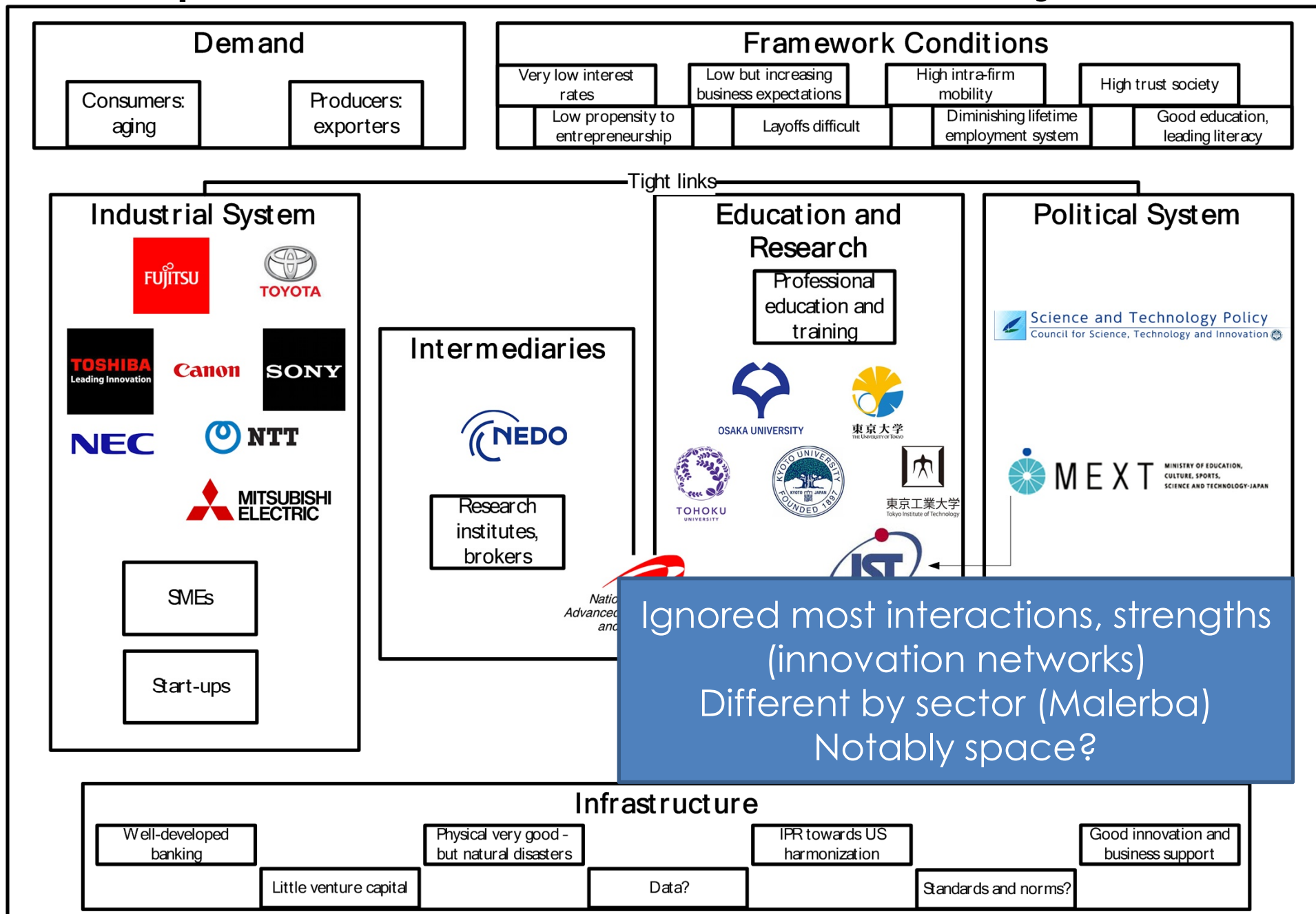# Japan's National Innovation System?

Japan's National Innovation System?

Japan's National Innovation System?

Japan's National Innovation System?

Demand

Consumers: aging

Producers: exporters

Framework Conditions

| Very low interest rates | Low but increasing business expectations | High intra-firm mobility | High trust society |
| Low propensity to entrepreneurship | Layoffs difficult | Diminishing lifetime employment system | Good education, leading literacy |

Tight links

Industrial System

FUJITSU

TOYOTA

TOSHIBA Leading Innovation

Canon

SONY

NEC

NTT

MITSUBISHI ELECTRIC

SMEs

Start-ups

Intermediaries

NEDO

Research institutes, brokers

National Advanced...

Education and Research

Professional education and training

OSAKA UNIVERSITY

東京大学 THE UNIVERSITY OF TOKYO

TOHOKU UNIVERSITY

KYOTO UNIVERSITY FOUNDED 1897

東京工業大学 Tokyo Institute of Technology

JST

Political System

Science and Technology Policy
Council for Science, Technology and Innovation

MEXT MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY-JAPAN

Ignored most interactions, strengths (innovation networks)
Different by sector (Malerba)
Notably space?

Infrastructure

| Well-developed banking | Physical very good – but natural disasters | IPR towards US harmonization | Good innovation and business support |
| Little venture capital | Data? | Standards and norms? | |

- What are the most important characteristics of innovation in Japan?

    - Of innovation policy?

    - Actors, policies, initiatives? Best practices?

    - Role of industrial policy & finance?

- Same question, in the space sector?