1. Outlook of GDP growth in Japan
2. Theory of economic growth
3. Barriers to low growth
   (1) Low level of internationalization
   (2) Low level of entries and exits of firms
   (3) High level of regulations
   (4) High level of public expenditure
   (5) High level of concentration in Tokyo
   (6) Aging and shrinking population
   (7) Political instability
   (8) Institutional lock-ins
   (9) Natural disasters
4. Evaluating current policies

PPP-Adjusted Real GDP per Capita

Source: Penn World Table 9.0
http://www.rug.nl/research/ggdc/data/penn-world-table
International Comparison of Income and Productivity Levels

- **PPP (purchasing power parity)-adjusted GDP**
  - Use hypothetical exchange rate to equalize price levels across countries
- **TFP (total factor productivity)**
  - Index of productivity to measure how much can be produced using the same inputs
  - Represent the level of technology, but may include measurement errors and economic cycles

\[
Y = AF(K,L) \quad K: \text{capital}, \quad L: \text{labor}, \quad A: \text{TFP}
\]

\[
A = \frac{Y}{F(K,L)}, \quad \text{for example} \quad A = \frac{Y}{(K^{1/3}L^{2/3})}
\]
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4. Evaluating current policies
Sources of growth in income per capita

- Capital stock (infrastructure and equipment)?
- Human capital (gained from education)?
- “Technology” (knowledge, ideas)?

Accumulation of physical and human capital

- Sources of short-run growth
- But, the effect diminishes in the long run.
  - ↑ equipment
    - ➔ ↓ effect of 1 additional unit on output
  - ↑ education
    - ➔ ↓ effect of 1 additional year of schooling on output
  - Accumulation of capital stops.
  - Growth stops.

Technological progress is the ultimate source of growth.

- Returns to innovation do not diminish.
  - ➔ Technology improves forever.
    - (➔ Returns to capital accumulation also increase.)
    - ➔ Growth lasts forever.
- Variation in productivity accounts for 60% of the variation in income per capita.
  (Caselli, 2005)
- “Technology” should be widely defined, including improvement in production processes (kaizen), management technology, ...

TFP and GDP per capita are closely related.
Growth of Follower Countries

In the long run, the growth rate is the same for any country.

In the short run, LDCs with a high steady state grow faster.

Steady state GDP per capita is higher when population is larger, or imitation productivity is higher.

R&D expenditure as a % of GDP


Small-world networks
(A friend of a friend of ... of mine is President Obama)

Clustered networks
(My friends are friends with each other)

Knowledge diffusion within networks (Centola, 2010)

Bridging ties

Diffusion of new knowledge (Watts & Strogatz, 1998)

Industrial agglomeration

Internationalization
1. Outlook of GDP growth in Japan
2. Theory of economic growth

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4. Evaluating current policies
Particularly, SMEs are not internationalized.

**Figure 1:**
- Number of exporting SMEs
- Share of exporting SMEs (% right scale)

**Figure 2:**
- International Research Collaboration
  - Size of circles: # of academic papers
  - Width of lines: # of collaborated papers

**Figure 3:**
- Impacts of Internationalization on Firm Productivity
  - Scale Economies
  - Specializing in skill-intensive processes
  - International Knowledge Diffusion

**Figure 4:**
- Internationalization → Productivity Growth
  - Average of labor productivity (million yen per worker)
  - Average of firms that started to export in 2000
  - Average of firms that did not export from 1995 to 2007

*Wakasugi et al. (2008)*
### Effects of Internationalization on Firm Productivity:
**Evidence from Econometric Analysis Using Firm-Level Data**

Productivity growth = $\beta_0 + \beta_1 \times \text{Internationalization} + \ldots$

<table>
<thead>
<tr>
<th>Study authors</th>
<th>Internationalization</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kimura et al. (2006)</td>
<td>Export FDI</td>
<td>Export: +2.4% FDI: +1.8%</td>
</tr>
<tr>
<td>Hijzen et al. (2007)</td>
<td>FDI</td>
<td>+2% (not robust)</td>
</tr>
<tr>
<td>Todo et al. (2008)</td>
<td>Overseas R&amp;D</td>
<td>Innovative R&amp;D: +2.8% (average)</td>
</tr>
<tr>
<td>Hijzen et al. (2010)</td>
<td>Offshoring</td>
<td>Intra-firm (FDI): +Inter-firm: no effect</td>
</tr>
<tr>
<td>Edamura et al. (2011)</td>
<td>FDI</td>
<td>To EU and US: +2.6% To Asia: no effect</td>
</tr>
</tbody>
</table>

### Effects of Internationalization on Employment:
**Evidence from Econometric Analysis Using Firm-Level Data**

Higuchi & Matsuura (2003) FDI 1 year after FDI: −6 years after FDI: +

<table>
<thead>
<tr>
<th>Study authors</th>
<th>Internationalization</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hijzen et al. (2007)</td>
<td>FDI</td>
<td>After 1 year: +2.9% After 6 years: +4.2%</td>
</tr>
<tr>
<td>Yamashita et al. (2010)</td>
<td>FDI</td>
<td>No effect</td>
</tr>
<tr>
<td>Edamura et al. (2011)</td>
<td>FDI</td>
<td>To EU and US: no effect To Asia: −1.9%</td>
</tr>
</tbody>
</table>

### Effects of Internationalization on Employment:
**Evidence from Econometric Analysis Using Industry-Level Data**

Agnese (2009) Offshoring JIP Database Goods: no effect Services: no effect (or +) (based on GMM)

<table>
<thead>
<tr>
<th>Study authors</th>
<th>Internationalization</th>
<th>Industry database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agnese (2012) Offshoring</td>
<td>OECD IO</td>
<td>Services Skilled workers: + Unskilled: −</td>
</tr>
<tr>
<td>Ahn et al. (2008) Offshoring</td>
<td>Asian International IO Tables</td>
<td>College: +14000 High school: −60000 Junior high: +44000</td>
</tr>
</tbody>
</table>
Effects of Offshoring for SMEs
(户堂, 2012; Todo, 2013)

<table>
<thead>
<tr>
<th>Effects on</th>
<th>Employment</th>
<th>Share of college graduates</th>
<th>Labor productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-firm (FDI)</td>
<td>No effect</td>
<td>+</td>
<td>No effect</td>
</tr>
<tr>
<td>Inter-firm</td>
<td>No effect</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Many productive firms are not internationalized in Japan.

TFP distribution for non-internationalized firms

"Lying dragon" firms

TFP distribution for Internationalized firms

Determinants of Internationalization (export/FDI)

Average domestic firm: 7.52
If the following covariate(s) of the average domestic firm improves by 1 SD:
- No. of exporters/FDI firms in the same region-industry: 10.3
- Log of TFP: 7.97
- Log of labor: 10.67
- Debt-to-asset ratio: 8.49
- All covariates: 16.91

Todo (2011)

Many "lying dragons" even among SMEs

Productivity distribution for non-internationalized SMEs

Lying dragons

for Internationalized SMEs

Labor productivity (value added per worker in million yen)

Todo and Sato (2011)
### Determinants of Internationalization of SMEs

**Effects on**

<table>
<thead>
<tr>
<th>President’s</th>
<th>Export/FDI/offshoring</th>
<th>Exit from export</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk aversion</td>
<td>—</td>
<td>No effect</td>
</tr>
<tr>
<td>Myopia</td>
<td>—</td>
<td>No effect</td>
</tr>
<tr>
<td>Overseas experience</td>
<td>+</td>
<td>—</td>
</tr>
<tr>
<td>Export experience</td>
<td>+</td>
<td>—</td>
</tr>
</tbody>
</table>

**Barriers to internationalization**
- Risks in overseas markets (↔ protected domestic markets)
- Lack of information
- Initial cost of internationalization

**Government does many policies to promote SMEs’ internationalization, but not enough.**

### Why aren’t SMEs internationalized?

- No need to be internationalized
- Worry about political risks
- Lack of human capital
- Lack of credit
- Lack of knowledge

**Probably due to heavy protection of SMEs**

### Decomposition of TFP Growth

\[
\ln TFP_t = \sum_f \theta_{f,t} \ln TFP_{f,t}
\]

- \( TFP_t \): aggregate TFP, \( TFP_{f,t} \): TFP of firm \( f \) in year \( t \)
- \( \theta_{f,t} \): sales share of firm \( f \) in year \( t \)

\[
\ln TFP_t - \ln TFP_{t-1} \quad \text{(growth rate of TFP)}
\]

\[
= \sum_{f\in\text{stayers}} \Delta \theta_{f} \Delta \ln TFP_{f,t} \quad \text{Within effect}
+ \sum_{f\in\text{stayers}} \Delta \theta_{f} (\ln TFP_{f,t} - \ln TFP_{f,t-1}) \quad \text{Reallocation effect}
+ \sum_{f\in\text{entrants}} \theta_{f,t} (\ln TFP_{f,t} - \ln TFP_{f,t-1}) \quad \text{Entry effect}
+ \sum_{f\in\text{exitors}} \theta_{f,t-1} (\ln TFP_{f,t} - \ln TFP_{f,t-1}) \quad \text{Exit effect}
\]

where \( x = \frac{x_t + x_{t-1}}{2}, \Delta x = x_t - x_{t-1} \)
Sources of TFP Growth in Manufacturing

Entry effect
Realloc. effect
Within effect
Exit effect
TFP Growth (net)
Productive firms exit.

Sources of TFP Growth in Non-Manufacturing

Entry effect
Realloc. effect
Within effect
Exit effect
TFP Growth (net)

Decomposition of Productivity: International Comparison

<table>
<thead>
<tr>
<th>Country</th>
<th>Period</th>
<th>Productivity growth</th>
<th>Within</th>
<th>Re-allocation</th>
<th>Entry</th>
<th>Exit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>1981-1990</td>
<td>1.81</td>
<td>1.18</td>
<td>0.13</td>
<td>0.73</td>
<td>-0.24</td>
</tr>
<tr>
<td>Japan</td>
<td>1990-2000</td>
<td>1.27</td>
<td>0.72</td>
<td>0.29</td>
<td>0.54</td>
<td>-0.29</td>
</tr>
<tr>
<td>South Korea</td>
<td>1990-1998</td>
<td>3.51</td>
<td>1.42</td>
<td>0.08</td>
<td>1.95</td>
<td>0.06</td>
</tr>
<tr>
<td>Canada</td>
<td>1988-1997</td>
<td>2.91</td>
<td>2.85</td>
<td>-0.37</td>
<td>0.26</td>
<td>0.17</td>
</tr>
<tr>
<td>US</td>
<td>1987-1992</td>
<td>0.66</td>
<td>-0.04</td>
<td>0.47</td>
<td>0.23</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Fukao (2012), Ahn, Kwon, and Fukao (2005), Baldwin and Gu (2003), Foster, Haltiwanger and Krizan (2001)
**Total early-stage Entrepreneurial Activity**

(Percentage of 18-64 population who are either a nascent entrepreneur or owner-manager of a new business)

Source: Global Entrepreneurship Monitor (http://www.gemconsortium.org/)

---

**Entrepreneurship as Desirable Career Choice**

(% of 18-64 population who agree with the statement that in their country, most people consider starting a business as a desirable career choice)

Source: Global Entrepreneurship Monitor (http://www.gemconsortium.org/)

---

<table>
<thead>
<tr>
<th>World Bank, Doing Business <a href="http://www.doingbusiness.org/">http://www.doingbusiness.org/</a></th>
<th>Starting a Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank</td>
<td>Procedures (number)</td>
</tr>
<tr>
<td>------</td>
<td>---------------------</td>
</tr>
<tr>
<td>New Zealand</td>
<td>1</td>
</tr>
<tr>
<td>Canada</td>
<td>2</td>
</tr>
<tr>
<td>Singapore</td>
<td>3</td>
</tr>
<tr>
<td>Australia</td>
<td>4</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>5</td>
</tr>
<tr>
<td>Rwanda</td>
<td>9</td>
</tr>
<tr>
<td>Malaysia</td>
<td>16</td>
</tr>
<tr>
<td>Taiwan, China</td>
<td>17</td>
</tr>
<tr>
<td>United States</td>
<td>20</td>
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<tr>
<td>Korea, Rep.</td>
<td>34</td>
</tr>
<tr>
<td>France</td>
<td>41</td>
</tr>
<tr>
<td>Tanzania</td>
<td>119</td>
</tr>
<tr>
<td>Japan</td>
<td>120</td>
</tr>
<tr>
<td>Nigeria</td>
<td>122</td>
</tr>
<tr>
<td>China</td>
<td>158</td>
</tr>
<tr>
<td>Myanmar</td>
<td>189</td>
</tr>
</tbody>
</table>
“Zombie” Firms (Hoshi and Kashyap 2011)

- Unproductive and unprofitable firms that should exit the market but stay in business with help from its creditors or the government.
  - Prevent efficient resource allocation and growth of healthy firms
- Collapse of asset prices in the early 1990s
  - Banks continued to loan to unprofitable firms to hide losses.
  - The government encouraged this to avoid public criticism against “credit crunch.”

Share of Zombies by Sector

Source: Caballero, Hoshi, and Kashyap (2008)

Zombies and TFP Growth

Source: Hoshi and Kashyap (2011)
Low TFP Growth within Firms or Zombies?

- Hoshi and Kashyap (2008): Zombies are major sources of low TFP growth
- Fukao (2012):
  Firm exits have lowered TFP growth since 1980s (when Japan’s growth was high).
  ➔ Low TFP growth within firms is more important. (though more entries and exits are needed)

Massive Entries and Exits in the Japanese Motorcycle Industry in the 1950s

1. Outlook of GDP growth in Japan
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   (9) Natural disasters
4. Evaluating current policies
Examples of Entry Barriers due to Regulations

- Act on the measures by large-scale retail stores for preservation of living environment (新大店法)
  - Revised version of an act that prohibited new large retail stores with more than 500m² without agreement of local incumbent shops
  - After revision in 2000, new stores can be established without agreement, but still local governments often intervene to protect incumbent small shops.

 ➤ Protected small shops become less productive, and many close business. (shutter streets)

Examples of Entry Barriers due to Regulations

- Regulations on fares and the number of Taxis
  - Taxi fees are strictly regulated.
  - The number of taxis are also regulated (was deregulated by P.M. Koizumi in 2002 but became regulated again in 2009 and will be more regulated soon).

 ➤ Fare in Tokyo: 520 yen/2km in 1990 → 710 yen in 2013 (37% increase despite 7% increase in CPI)
  - # of passengers: 2.9 billion in 2003 → 2.0 in 2008

Regulation ➤ Harmful not only to consumers and but also protected industries

Hoshi and Kashyap (2011)

Alternative Regulation Index

# of “strong” regulations (generally prohibited but permitted under special conditions)
1995 = 1

Hoshi and Kashyap (2011)

TFP Growth 1995-2005 and Alternative Regulation Index in 2005 Manufacturing
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---

**Share in Population in the Country (%)**

- Tokyo
- London
- New York
- Chicago
- Greater Tokyo
- Greater Osaka
- Greater Nagoya
- Others

---

**Share of public investment, 1992-2003**

- Postal service, telephone and telegraph
- Railways
- Agriculture-related public capital and fishing ports
- Roads, harbors and airports
- Erosions of flood control and conservation of forests

---

*Hoshi and Kashyap (2011)*

---

*Statistical Bureau, Ministry of Internal Affairs and Communications, Statistical Yearbook 2012.*

Heavy concentration in Tokyo

- Bad living conditions
- High risk of natural disasters
- Less diversification → less innovation

(Fujita and Berliant, 2011)

Great Kanto Earthquake in 1923

Low level of industrial agglomeration in other areas

Business Density and Return on Assets by Prefecture

Vicious cycle

Low agglomeration

Low productivity

Industrial Agglomeration ⇒ ↑ Productivity?

Konishi and Saito (2012)

Agglomeration of diversified industries
⇒ ↑ productivity
Agglomeration of the same industry ⇒ no effect

Fukao et al. (2011)

Spatial proximity to top firms in same industry
⇒ ↑ productivity
But no effect for high-tech industries

Yes, but industry diversification is important in high-tech industries

Why few agglomeration outside Tokyo?

% of provincial areas
(Hokkaido, Tohoku, Hokuriku, Chugoku, Shikoku, and Kyushu)

Public investment
Population

出所: 総務省ウェブサイト、総務省統計局（2010）、『日本統計年鑑』、本間・田中（2004）、林（2004）
Can Policies Promote High-Tech Clusters?
Zhongguancun Science Park (Beijing, China)

- Only R&D-intensive firms are allowed
- Corporate tax rate: 15% (exempted for the first 3 years)
- Other tax incentives
- Finance new firms stemming from universities

Factors for ZGC’s Success: Promoting Networks
(Todo et al. 2009, 2011; Cai et al. 2007)

- MNEs
- Research collaboration
- Spin-offs
- "Sea turtles"
- Universities
- Industry-university collaboration

Policies in Japan: “Industry Cluster Plan”
Promoting 18 clusters in Japan

- Large effect on productivity in R&D activities
- Small or no effect

- Promoting interfirm/firm-university collaboration (exhibitions, seminars)
- Subsidies to R&D expenditure
- Collaboration with firms outside the cluster
- Collaboration with firms in the cluster
- Collaboration with the local national university

(74) China’s Silicon Valley

Sales $200 billion (2010)

(75) Factors for ZGC’s Success: Promoting Networks

(76) Policies in Japan: “Industry Cluster Plan”

(74) China’s Silicon Valley

Sales $200 billion (2010)
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Recent Prime Ministers in Japan

<table>
<thead>
<tr>
<th>Year</th>
<th># of days</th>
<th>Name</th>
<th>Year</th>
<th># of days</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993-1994</td>
<td>263</td>
<td>Morihiro Hosokawa</td>
<td>2008-2009</td>
<td>358</td>
<td>Taro Aso</td>
</tr>
<tr>
<td>1994</td>
<td>64</td>
<td>Tsutomu Hata</td>
<td>2009-2010</td>
<td>266</td>
<td>Yukio Hatoyama</td>
</tr>
<tr>
<td>1994-1996</td>
<td>561</td>
<td>Tomiichi Murayama</td>
<td>2010-2011</td>
<td>452</td>
<td>Naoto Kan</td>
</tr>
<tr>
<td>1996-1998</td>
<td>932</td>
<td>Ryutaro Hashimoto</td>
<td>2011-2012</td>
<td>482</td>
<td>Yoshihiko Noda</td>
</tr>
<tr>
<td>1998-2000</td>
<td>616</td>
<td>Keizo Obuchi</td>
<td>2012-</td>
<td>266</td>
<td>Shinzo Abe</td>
</tr>
<tr>
<td>2000-2001</td>
<td>387</td>
<td>Yoshiro Mori</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Estimation from cross-section growth regression (Aisen and Veiga (2010))

Change of prime minister/president $\rightarrow$ ↓ growth rate of GDP per capita by 1.5-2.5%

Institutions and Economic Growth
(Acemoglu et al. 2001, 2002; Acemoglu and Robinson 2012)

Definition of Institutions

- Rules of the game
  - “humanly devised constraints that structure political, economic and social interactions” (North 1991)
  - Include formal rules (constitutions, laws, property rights) and informal restraints (sanctions, taboos, customs, traditions),
- Equilibrium endogenously determined by the rules (Aoki 2011, 2012)
How are institutions determined?

Example: Choice between Windows and Mac

Characteristics of equilibrium
- History matters (path-dependence).
- The equilibrium is sticky.
- The equilibrium may not be optimal.
- Expectations can change the equilibrium.

Effects of Institutions on Long-Run Economic Growth

- Historical event
- Geographic characteristics
- Historical institutions
- Lock-in
- Current institutions
- Current income levels

Effects of Institutions on Economic Growth

- GDP per capita (constant US$) in 1995
- Current institutions
- Current income levels

- Measure of current property right protection
  - Current institutions
  - Acemoglu et al. (2001)

- Colonial Settlers’ Mortality (per 1000)
  - Climate and geographic conditions + historical event
  - Exploitative institutions → Poverty in Africa

Acemoglu et al. (2001)
From the Perspective of Network Analysis

- Strong ties within community ➔ Closed/exclusive networks

- Isolation policy in the Edo Era (1639-1854) (highly regulated trade)
  ➔ Wake of nationalism and expulsion of foreigners in the 1850s and 1860s.

- Great Depression ➔ Block economies ➔ World War II

- Import substitution industrialization in Latin America from the 1950s to 1970s.

Institutional Complementarity

When multiple institutions are inter-related, changes in institutions are more difficult.

(青木・奥野 1996; Aoki 1990, 2010)
Institutional Complementarity in Japan: 1950-1990

**Employment**
- Long-term employment
- Seniority wage
- Team production where firm-specific tacit knowledge matters

**Inter-firm relations**
- Keiretsu: long-term relations b/w suppliers & assemblers

**Corporate governance**
- Cross-shareholding between firms
- Main-bank system

**Government**
- Bureau-pluralism

---

Institutional Complementarity in Japan: 1950-1990

**Employment**
- Provides incentive to invest in firm-specific knowledge
- Team production where firm-specific tacit knowledge matters

**Inter-firm relations**
- Keiretsu: long-term relations b/w suppliers & assemblers

**Corporate governance**
- Cross-shareholding between firms
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- Main-bank system

**Government**
- Bureau-pluralism

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Institutional Complementarity in Japan: 1950-1990

**Employment**
- Long-term employment
- Seniority wage
- Team production where firm-specific tacit knowledge matters

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Recent Changes in Institutions in Japan

<table>
<thead>
<tr>
<th>Ownership</th>
<th>1990</th>
<th>1995</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional investors</td>
<td>9.3%</td>
<td>11.8%</td>
<td>12.9%</td>
</tr>
<tr>
<td>Foreign</td>
<td>4.4%</td>
<td>7.8%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Cross-shareholding</td>
<td>14.6%</td>
<td>14.1%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Debt/asset</td>
<td>51.6%</td>
<td>50.0%</td>
<td>49.6%</td>
</tr>
<tr>
<td>Borrowing from main bank/asset</td>
<td>4.6%</td>
<td>5.3%</td>
<td>NA</td>
</tr>
</tbody>
</table>

Jackson and Miyajima (2007)

Emergence of Hybrid Institutions

<table>
<thead>
<tr>
<th></th>
<th>Market employment</th>
<th>Relational employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational finance</td>
<td>Inverse hybrid</td>
<td>J model</td>
</tr>
<tr>
<td>Market finance</td>
<td>US model</td>
<td>Hybrid</td>
</tr>
</tbody>
</table>

Jackson and Miyajima (2007)

Emergence of Hybrid Institutions

<table>
<thead>
<tr>
<th></th>
<th>J Hybrid</th>
<th>Inverse hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond ratio</td>
<td>2%</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Bank loan ratio</td>
<td>18%</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td>Lifetime employment</td>
<td>100%</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>Merit-based pay</td>
<td>0%</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Stock options</td>
<td>19%</td>
<td>39%</td>
</tr>
<tr>
<td></td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>% of firms</td>
<td>42%</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>34%</td>
<td>34%</td>
</tr>
<tr>
<td>% of employees</td>
<td>16%</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>18%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Jackson and Miyajima (2007)

Recent Changes in Institutions in Japan

- Inter-firm relations
  - Keiretsu has been weakened.
  - Modularization of parts and components (promoted by the Great East Japan earthquake)
- Bureau-pluralism has been weakened.
  - Diversified industries and firms
  - LDP’s “initiative taken by politicians”

Simultaneous changes in various institutions ➔ new equilibrium?

Jackson and Miyajima (2007)
1. Outlook of GDP growth in Japan
2. Theory of economic growth
3. Barriers to low growth
   (1) Low level of internationalization
   (2) Low level of entries and exits of firms
   (3) High level of regulations
   (4) High level of public expenditure
   (5) High level of concentration in Tokyo
   (6) Aging and shrinking population
   (7) Political instability
   (8) Institutional lock-ins
   (9) Natural disasters
4. Evaluating current policies

Empirical Results from Cross-Country Analysis
(Skidmore and Toya, 2002; Cuaresma et al. 2007; Sawada et al. 2011)

- Natural disasters do not necessarily hinder growth.
- Natural disasters do not necessarily hinder growth.

Were impacts of disasters propagated through supply chain networks?
- Tokui et al. (2012)
  - Simulation using an IO-based model
  - Loss of 1.35% of GDP by the Great East Japan earthquake
  - 90% of the loss due to disruption of supply chains

Meteorological disasters (e.g., typhoons and droughts) increase long-term growth.

Most probably due to technological/institutional changes led by disasters
Possible Effects of Supply Chains on Production After a Disaster

Disruption of supplies

Flow of material and parts

- Propagation of effects through supply chains

+ Support from partners

Main Results

<table>
<thead>
<tr>
<th>Effects on</th>
<th>Recovery time (short-run)</th>
<th>Sales growth (medium-run)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppliers in impacted areas</td>
<td>No</td>
<td>+</td>
</tr>
<tr>
<td>Suppliers outside impacted areas</td>
<td>- (+ on recovery)</td>
<td>No</td>
</tr>
<tr>
<td>Suppliers of direct suppliers</td>
<td>+</td>
<td>No</td>
</tr>
</tbody>
</table>

- through disruption of supplies
+ through support and substitution
+ through agglomeration effect

戸堂他 (2013), Todo et al. (2013)
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Abe Government’s “New Growth Strategy”
- Promoting entries and exits of firms
- Promoting venture capital investment
- Promoting changes in industry/firm structure
- Promoting internationalization
  - Overseas sales of infrastructure
  - SMEs
  - Foreign direct investment to Japan
  - Human capital
- Creating special economic zones to experiment deregulation

Evaluating the “New Growth Strategy”
- Grade: A
- Question is: Can it be implemented?
- Concerns
  - Act on strengthening industry competitiveness (産業競争力強化法):
    Too much government intervention?
  - New drugs are not allowed to be sold online. Flexible employment rules will not be implemented in the special economic zones: Deregulation is impeded.