

RIETI International Symposium

**Information Technology and
the New Globalization:
Asia's economy today and tomorrow**

Handout



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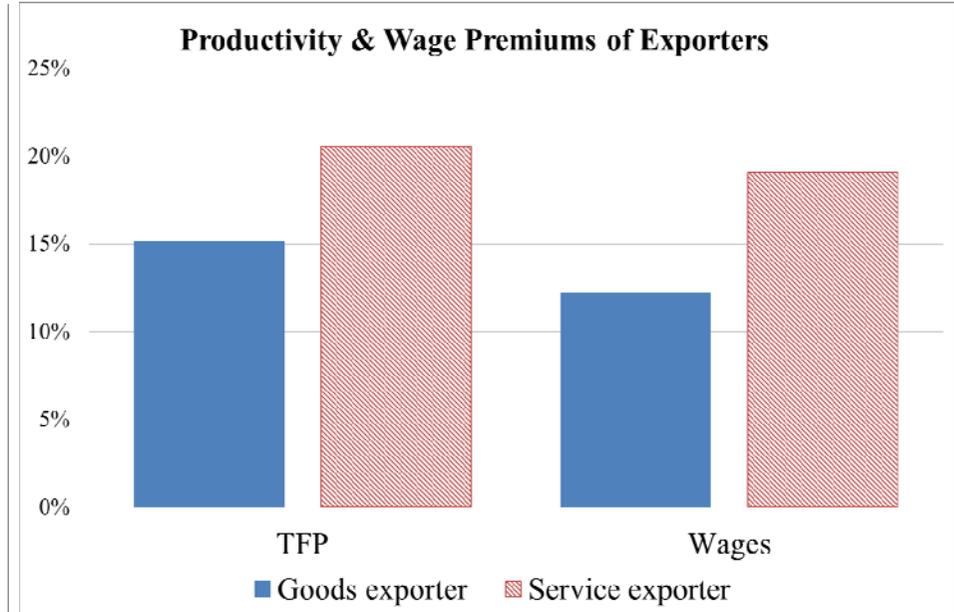
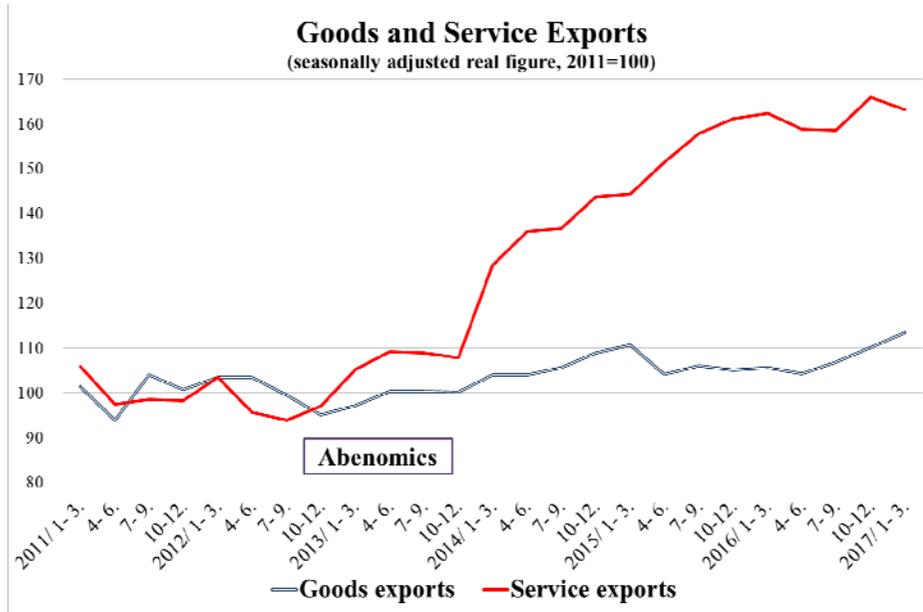
Globalization, AI, and Productivity: From the Viewpoint of the Service Economy

August 2017

Masayuki Morikawa (RIETI)

Service Trade and Productivity

- In spite of the depreciation of the yen since the latter half of 2012, goods exports have been sluggish. However, service exports have increased substantially.
- Exporters are generally more productive than non-exporters, but the service exporters' productivity/wage premium is greater than goods exporters'.
- The observed productivity premium does not necessarily mean causality. However, an increase in service exports contributes to productivity improvement through reallocation of resources from less productive firms to more productive firms (**reallocation effect**).

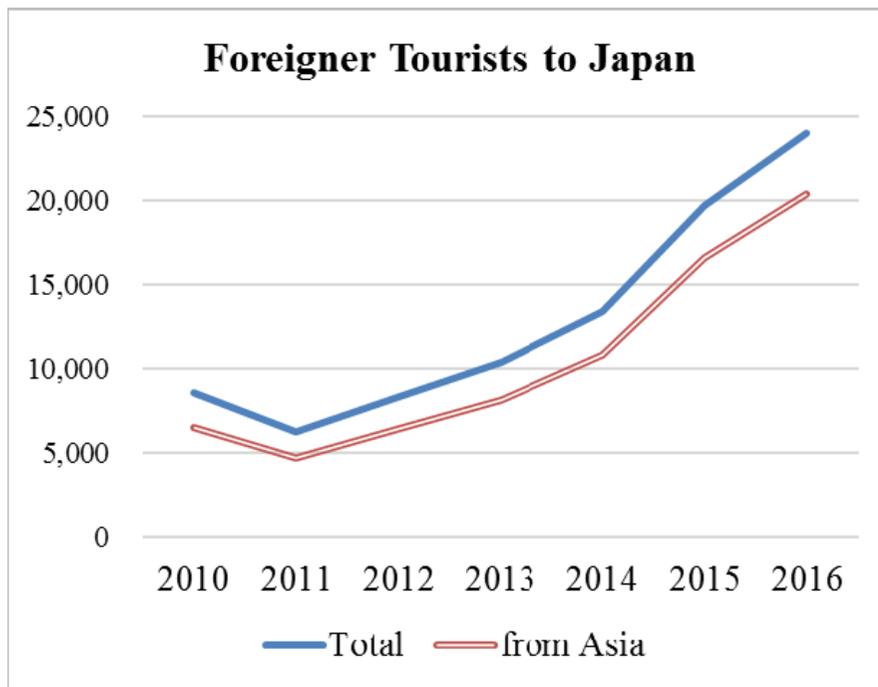


(Source) Quarterly Estimates of GDP (Cabinet Office).

(Source) Morikawa, Masayuki (2014). "Service Trade and Productivity: Firm-level evidence from Japan." RIETI Discussion Paper, 15-E-030.

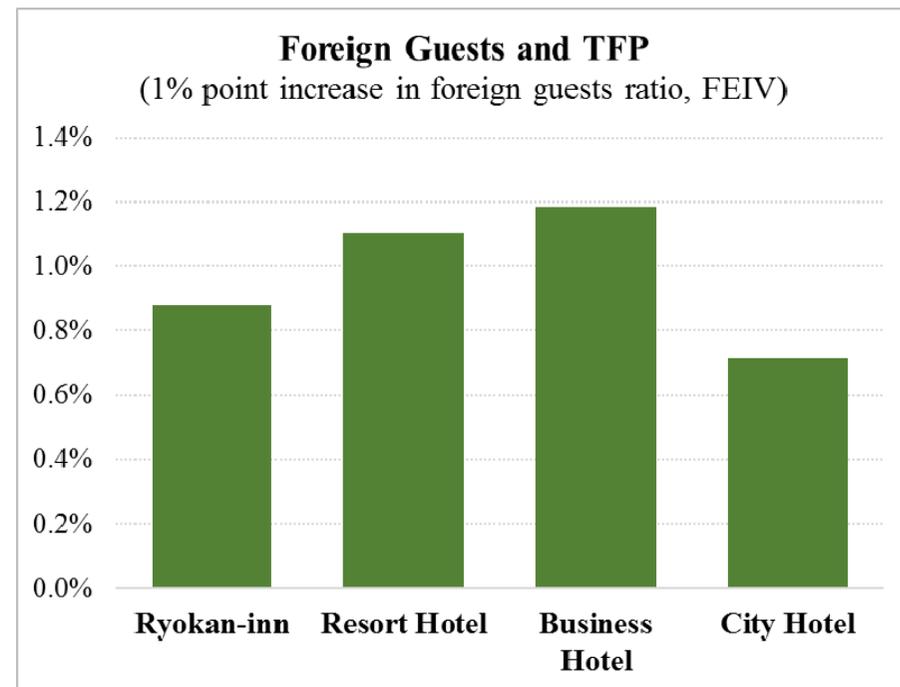
Foreign Tourists on Productivity

- The number of foreign tourists visiting Japan increased fourfold over the last five years (31% p.a.). Visitors from Asian countries comprised 85% of the total in 2016.
- Growth in the number of foreign guests has a positive impact on the room occupancy rate of accommodation facilities through **demand-smoothing channel**, as well as a direct quantitative effect of simply increasing total guest-nights.
- The *measured* TFP of the accommodation facilities improved substantially.



(Note) Expressed in thousands.

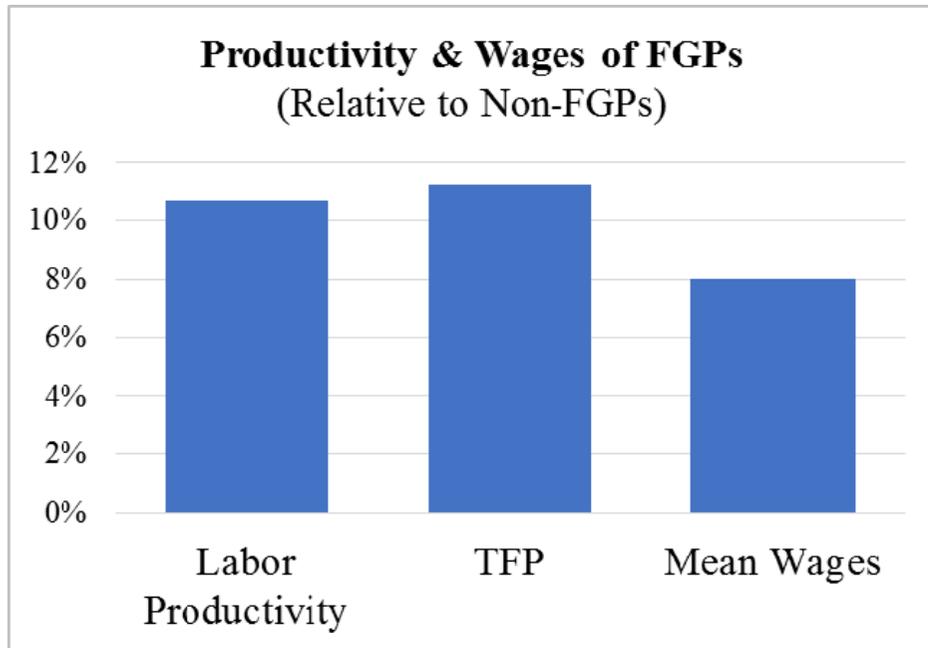
(Source) “The Number of Foreign Visitors to Japan” (Japan National Tourism Organization: JNTO).



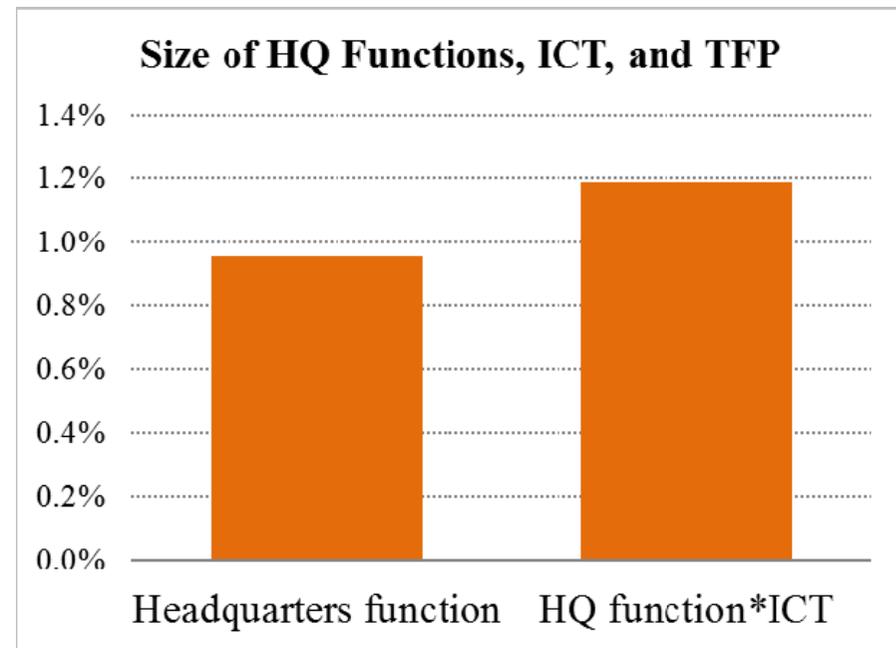
(Source) Morikawa, Masayuki (2017). “Impact of Foreign Tourists on Productivity in the Accommodation Industry: A panel data analysis,” RIETI Discussion Paper, forthcoming.

Servitization of Manufacturers: FGPs, HQ Functions

- Manufacturing firms in advanced economies are servitizing alongside the deepening of the GVC.
- “**Factoryless goods producers**” (FGPs) invest intensively in intangible assets and have larger headquarters functions. Productivity of offshoring FGPs is around 10% higher than the non-FGPs.
- As the core service sector inside firms, **headquarters** conduct a wide range of highly strategic activities. Manufacturing firms’ headquarters services embedded on their products are exported.
- Headquarters functions contribute positively to firm’s TFP. Headquarters functions and ICT network have a complementary role for productivity.



(Source) Morikawa, Masayuki (2016). “Factoryless Goods Producers in Japan,” *Japan and the World Economy*, 40, 9-15.



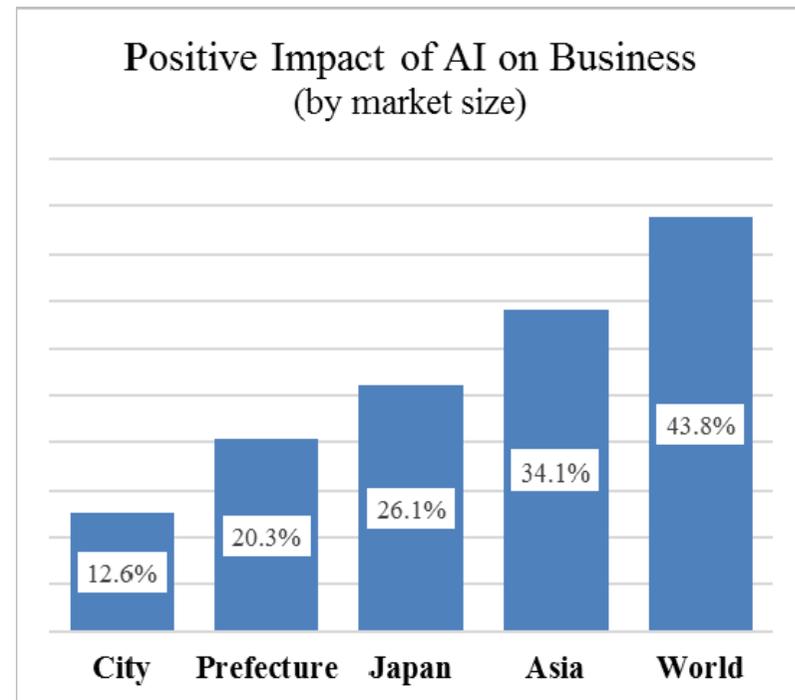
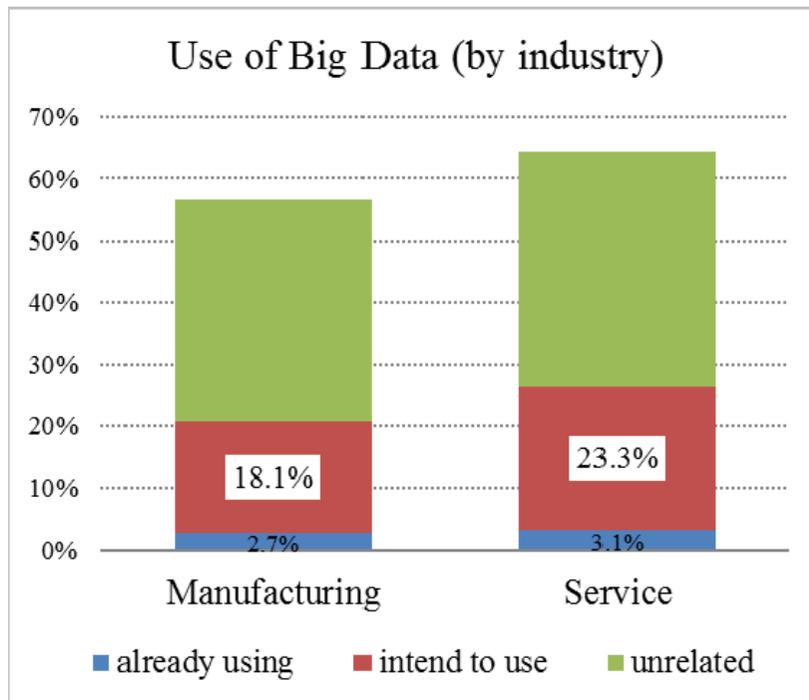
(Notes) The bars indicate the effect of 1 SD greater HQ from FE estimations.
(Source) Morikawa, Masayuki (2015). “Are Large Headquarters Unproductive?” *Journal of Economic Behavior & Organization*, 119, 422-436.

Investments for the Future Strategy 2017 (“Society 5.0”)

- Amid the stagnant productivity and potential growth rates in major advanced economies, policymakers expect the “**Fourth Industrial Revolution**” – IoT, Big Data, artificial intelligence (AI), and robotics – to drive future economic growth.
- In Japan, “*Investments for the Future Strategy 2017*,” the latest growth strategy of the Cabinet, places the Fourth Industrial Revolution as the top priority of the growth promotion policies.
- On the other hand, the negative impacts of AI and robotics, especially the loss of human jobs, have been actively discussed around the world (e.g., Frey and Osborne, 2017; Arntz et al., 2016; David, 2017).

Service Sector as “AI-using Industries”

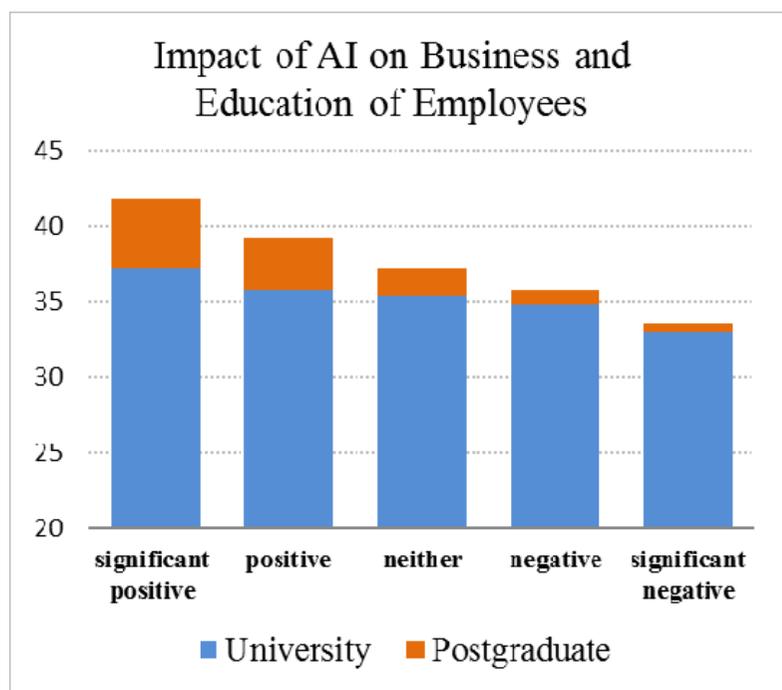
- A large number of firms intend to use big data for their businesses and have positive expectations about the impacts of AI and robotics on their businesses.
- Firms in the service sector generally have positive views about the use of big data, which is similar to the well-known fact that “IT-using industries,” such as retail, transportation, and finance, reap the benefits of the IT revolution. Today, we should pay attention to the “**AI-using industries.**”
- Firms that operate in global markets have a positive view on the impact of AI and robotics, suggesting complementarity between globalization and the Fourth Industrial Revolution.



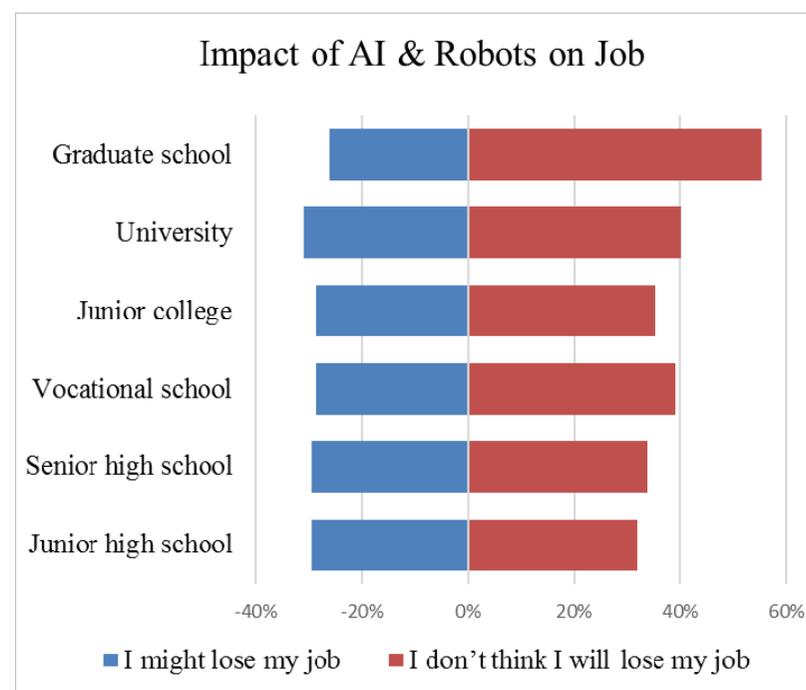
(Source) Morikawa, Masayuki (2017). “Firms’ Expectations about the Impact of AI and Robotics: Evidence from a Survey.” *Economic Inquiry*, 55(2), 1054-1063.

Complementarity between AI and Human Skills

- We observe complementarity between AI-related technologies and the skill level of employees. The complementarity is prominent for employees with postgraduate education.
- According to a survey on individuals, about 30% of workers perceive their jobs to be at risk. However, those who have postgraduate education, particularly in STEM fields, show a lower subjective risk of losing their jobs.
- These observations suggest that malleable/adaptable high skills acquired through higher education are complementary with AI and robotics.



(Source) Morikawa, Masayuki (2017). “Firms’ Expectations about the Impact of AI and Robotics: Evidence from a Survey.” *Economic Inquiry*, 55(2), 1054-1063.



(Source) Morikawa, Masayuki (2017). “Who Are Afraid of Losing Their Jobs to Artificial Intelligence and Robots? Evidence from a survey,” RIETI Discussion Paper, 17-E-069.

Issues to be Discussed

- How next generation IT (Fourth Industrial Revolution) will impact:
 - the pattern of task-based comparative advantage
 - employment and wages
 - productivity
- What the governments in Asian countries should (or should not) do:
 - to reap the benefits of the new IT
 - to deal with inequality in the labor markets