

# Alexander Rechberger

## Competing for Supply-Driven R&D Investments by Foreign MNEs

### A Comparative Study of China, Japan and the United States

#### Topic and Research Question

For states, the advancement in science and technology (S&T) plays a vital role because it allows their economies to further integrate into global value chains, to expand domestic knowledge clusters and to increase productivity levels. An effective means of enhancing this innovation process is the promotion of investments in research and development (R&D) by foreign multinational enterprises (MNEs). This is the case, because foreign MNEs are not only characterized by a higher R&D intensity than their domestic counterparts, but also because they can create knowledge and technology spillovers to domestic firms, universities, and other research facilities.

In view of the importance of R&D investments for the development of national innovation systems and for increasing productivity levels, this master's thesis proposes to investigate and critically compare China's and Japan's host-country environment for the attraction of supply-driven R&D by mapping their S&T capabilities and infrastructures and by assessing their government promotion strategies. Furthermore, to create a more complete picture regarding the strengths and weaknesses of the two East Asian countries and to identify how foreign activities can be further increased, the United States was added as benchmark to the analysis. In view of this, the following research questions were formulated:

*How do Chinese and Japanese location-specific characteristics differ and what are the similarities and differences of their promotion strategies for R&D investments by foreign MNEs?*

*How competitive are China and Japan in attracting supply-driven R&D by MNEs compared to the United States?*

#### State of the Art

For this thesis, a broad range of theoretical and empirical literature was reviewed and evaluated. Due to the rising significance of innovation for economies, supply-driven R&D was particularly highlighted by the state of the art as main driver for foreign MNEs to go abroad. A variety of studies tried to explore the location-specific determinants that influence such investments by analyzing the activities of MNEs in developed and emerging markets. Falk (2004) and Russell (2011) for instance, argued that the activities of local research institutions were vital determinants to attract supply-

driven R&D, while others stressed that factors such as the local S&T infrastructure (e.g., Davis & Meyer, 2004; Thursby & Thursby, 2006) and human capital (e.g., Gassmann & Han, 2004; Siedschlag et al., 2013) were key factors for foreign MNEs' investment decisions.

#### Methodology and Approach

The literature review has shown that there is not one single factor that can explain why foreign MNEs favor one country over another. Instead, this issue has to be analyzed from a variety of perspectives. Therefore, an analytical framework consisting of five categories was created for the comparative analysis. Each of these categories comprise a number of criteria that seek to assess the local environment for foreign MNEs and the approach a government is taking towards R&D investments.

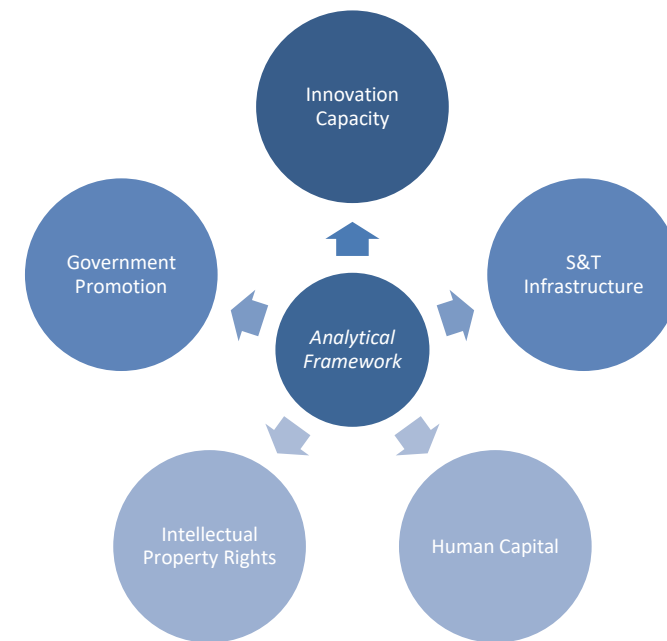


Figure 1. Analytical Framework

#### Main Facts

The analysis of the first category, **innovation capacity** shows that China has experienced the strongest development of all three countries, becoming the second

biggest spender on R&D worldwide. However, indicators such as the R&D intensity as well as the composition of R&D and triadic patenting activities also display that the innovation capacity of China is still not as advanced as total numbers would suggest and that it has yet to catch up to Japan and the United States in this respect.

The assessment of the **S&T infrastructure** shows that several high-quality research facilities in the corporate, government and tertiary education sectors could be found in all three countries. Furthermore, all governments follow a similar approach to integrate foreign MNEs into local innovation clusters by organizing, supervising, and funding collaboration between enterprises, universities, and the public sector.

The third category, **human capital** indicates that the United States is the country with the highest education spending in comparison to the national income and that it has a high quantity and quality of students in tertiary education. This was illustrated by the gross enrollment rate (89%) and the percentage of graduates from master's (23%) and PhD (1.8%) programs. In Japan, graduates with PhD (1.6%) almost matched the level of the United States, whereas China (0.44%) had the lowest proportion of highly qualified graduates. The analysis of R&D staff on the other hand, shows that not only the largest number of total R&D personnel, but also the biggest quantity of researchers (FTE) is available in China, followed by the United States and Japan.

The assessment of **intellectual property rights** displays that Japan and the United States have introduced an efficient system to protect the rights of domestic and foreign companies. This is illustrated not only by the protection and enforcement mechanisms, but also by the fact that they have adapted their frameworks to international standards and regulations. China on the other hand, has for long been criticized for its weak legal framework. The Chinese government has recognized the importance of this issue and has implemented several reforms in recent years. Yet, issues in the legal system remain, and additional efforts are needed to remove potential factors that deter foreign MNEs from establishing activities in the Chinese market.

Last, **government promotion policies**. Here, a similar approach could be identified by China and Japan. Both governments have implemented a variety of pre-and aftercare services as well as incentive measures to further increase investments by foreign MNEs, with a particular focus on fiscal tools in form of tax credits or tax deductions.

#### Results

This thesis shows that China and Japan have recognized the benefits of FDI and view it as effective tool to strengthen the national innovation system. They both try to influence and regulate investments by providing a variety of incentives and by allowing R&D activities of foreign MNEs to integrate into local innovation clusters. Findings further display that both countries already possess strong host-country environments, which can compete with that of the United States in many aspects. However, the comparative analysis also revealed that there are some mismatches in the respective systems that possibly deter foreign activities. One notable example is the issue of intellectual property rights in China, where many concerns remain for foreign companies. Given the increased competition for FDI, this shows that China and Japan have to make further adjustments if they aim to increase foreign activities even further and if they want to take advantage of the benefits that come with the investments of highly innovative firms, such as knowledge and technology spillovers and increased productivity levels. While gaps in the legal framework can be fixed rather quickly, other factors such as the quality of the human capital can only be improved over a longer period. However, if done successfully, such long-term changes do not only lead to an increased activity of foreign MNEs, but at the same time strengthen the national innovation system and increase the ability of domestic actors to benefit from technology spillovers.

#### References

All references can be found in the full version of the MA thesis available at <http://othes.univie.ac.at/>

#### About the Author

Alexander Rechberger earned a bachelor's degree in Political Science from the University of Vienna, Austria. During his studies, he spent a year abroad at Temple University Japan and gained work experience in Germany and Japan.

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