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Industrial Clusters in North East Asia

A Comparative Analysis of Electronics and IT Clusters in Japan, China and South Korea

Topic and Research Question

Industrial clusters are an economic phenomenon with far reaching advantages which are widely recognized since the 1990s (Bergman and Feser 1999; CLOE 2006), among them being an increase in regional employment, productivity, innovation, levels of trust and international competitiveness. As a result, clusters have come to dominate the economic maps of the world and are embraced by politicians who aim at fostering economic development and innovation (CLOE 2006; Kuah 2002; Lämmer-Gamp, Meier zu Köcker and Christensen 2011; Porter 1998; Sirkin 2012; The World Bank 2009). While there are many famous clusters around the world, such as the Silicon Valley or the Detroit automobile cluster in the USA, this thesis focused on electronics and IT clusters located in Japan, China and South Korea. This is not only because electronic items influence our everyday lives and literature focuses mainly on western clusters but also because the three North-East Asian countries are leaders on the global market for IT and electronics goods (See: Forbes 2015).

The main research question the thesis answered was "*Which similarities and differences can be identified between electronics and IT clusters in Japan, China and South Korea?*". The findings served as a base to answer the second research question, namely: "*Is there a North-East Asian type of electronics and IT clusters?*" This question was especially interesting as some authors have argued that every country and every industry is characterized by unique clusters (Christensen, Lämmer-Gamp and Meier zu Köcker 2012; Palacios 2005; Todeva 2006).

State of the Art

Publications on industrial clusters range from guidelines providing suggestions to governments and businesses (Kuchiki and Tsuji 2011) to papers on the link between clusters and economic development in Asian nations (Eriksson 2013), comparative studies of two case study clusters (Yun et al. 2010) and descriptive papers outlining the characteristics of single East Asian clusters (Oh 2014). Among some of the most important authors who influenced this thesis are Kuchiki and Tsuji who have published a large number of papers on industrial clusters in East Asia or Yun et al. (2010) who published a comparative analysis of TFT-LCD clusters in South Korea and Taiwan due to the similarity of the research topic.

Of course Porter (1990; 1998; 2000; 2007) – who has coined the term 'cluster' – was also quintessential to the collection of information on clusters in general. The author who comes closest to dealing with the topic of this thesis, on the other hand, is Jankowiak (2012) who arrives at the conclusion that there is no "Asian type of clusters". However, in his work there is neither a focus on North-East Asia nor on a single industry. Overall, it could thus be concluded that literature lacks a comprehensive and in-depth comparative analysis of North-East Asian IT and electronics clusters.

Methodology and Approach

The thesis discussed not only common cluster definitions and defined the category 'IT & electronics cluster', the author also highlighted research fields in which clusters are discussed and provided a brief overview of existing cluster theories by Porter, Weber and Marshall. The following paragraphs described the research approach (deductive), the time horizon (cross-sectional), the research method (qualitative research) and the research strategy (case studies).

The methodological framework used as the base of the empirical analysis of the case study clusters represents a compilation of analytical elements considered important by various cluster experts as literature failed to provide one universally applicable methodology to analyze and compare clusters. Six analytical elements were extracted from literature, explained, a hypothesis for each element formulated and a matrix developed based on which clusters could be divided:

Main Facts

In the course of the empirical analysis, the author analyzed Chinese, South Korean and Japanese clusters in general, as well as the six case study clusters in Shenzhen, Beijing, Gumi, Daejeon, Hokkaido and Kyushu in specific. The results indicated that North-East Asian IT and electronics clusters benefit from a high quality of infrastructure. Similarly, all six case study clusters are located in strategic regions supporting business operations and trade. Moreover, North-East Asian local and central governments were found to actively influence cluster development and management. The clusters analyzed also display a high level of cluster-internal cooperation and networking – an important factor in driving innovation – as well as links to international cluster networks, foreign investors and universities or research centers abroad.

Several findings, however, also indicated differences between clusters in Japan, South Korea and China:

➢ Chinese and South Korean IT and electronics clusters tend to be based in industrial parks with defined geographical borders and a high density of members. They are also characterized by an extraordinarily high number of cluster entities (up to 10,000).

➢ The Japanese clusters analyzed, on the other hand, spread across entire islands with a low density of cluster members. Furthermore, they approximate western clusters in regard to the number of cluster entities (approximately 200 to 300).

Results

The final research results were summarized in *Table 6* before the research questions and hypotheses were discussed in the consecutive chapter. As already hinted on in 'Main Facts', the thesis concluded that there are both similarities and differences: While North-East Asian electronics and IT clusters were found to be strikingly similar regarding the quality of cluster infrastructure, the state influence, prevalent cluster member linkages and the degree of internationalization, the case study clusters displayed differences in regard to the number of cluster entities and the cluster member proximity.

Based on the comparative analysis, the second research question posed in this thesis, asking "*Is there a North-East Asian type of electronics and IT clusters?*", could be negated. The research findings could also be used as a base against which to test the formulated hypotheses. Out of six hypotheses, four were tested positively, while two hypotheses, namely those regarding the number of cluster entities and cluster entity proximities, did not hold true.

The consecutive paragraphs, in addition, discussed limitations of the thesis, the result relevance and potential topics for future research.

References

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

About the Author

Karin Schallauer studied Global Sales and Marketing at the *University of Applied Sciences* in Steyr, completing a semester abroad at the *Ritsumeikan Asia Pacific University* in Japan, before commencing her Master studies on 'East Asian Economy and Society' at the *University of Vienna*.

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	Category A	Category B	Category C
Infrastructure	Well-developed infrastructure	Lacks key infrastructure	Lacks most infrastructure
Number of Entities	Between 30 and 200 cluster entities	Slightly below 30 or above 200 cluster entities	More than 500 or less than 10 cluster entities
State Involvement	Strong state involvement	Some state involvement	No state involvement
Location and Proximity	Located strategically and within a dimension of max. 3 hours	Cluster lacks certain aspects regarding location or dimension	Distance between members is too great and no beneficial location
Cluster Member Linkages	Joint R&D projects, value chain links and relations to state- and support agencies	Mostly independent members with project-based interaction or future plans to increase cooperation	No joint projects or collaborations and no value chain links
Internationalization	Links to global cluster networks and presence of foreign companies and MNCs	Cluster lacks international members or links to global cluster/industry networks	Neither global linkages nor international members

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