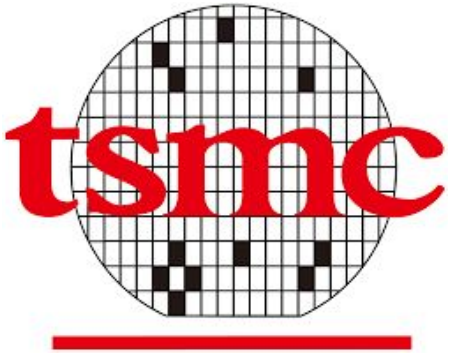
Network Analysis and Supply Chain

Introduction

The world are going through **shortage of semiconductors** which is a part of most of electronic devices. At present, **TSMC** ,Taiwan company, is the **leading company** in this industry. **China** is going to promote their semiconductor industry; however, their productivity is far **behind TSMC** and **Samsung** (Korean company).



Sources of data

Gephi

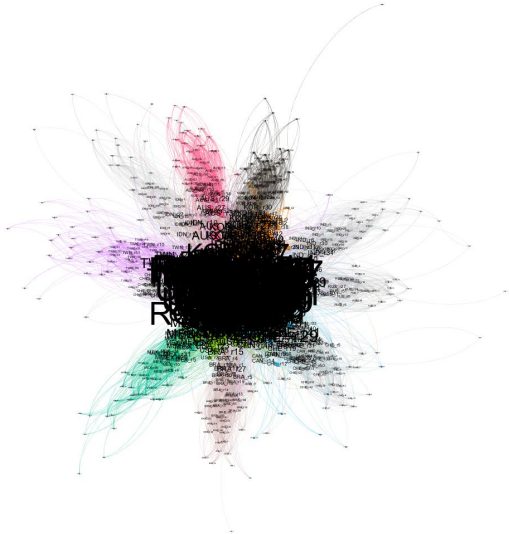
WIOD

Methodologies

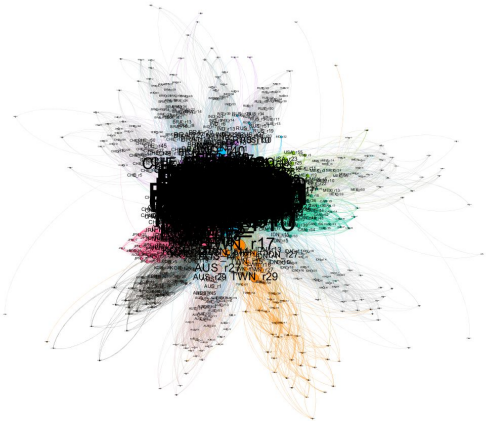
1. Import World IO table to Gephi.
2. Use Gephi to run the data and all indicators to get the network overview.
3. Run the layout to get the network diagram.
4. Use the data laboratory to find centrality indices of specific industry and country.
5. Compare and analyze the result from the data above.

Comparison of main network indicators

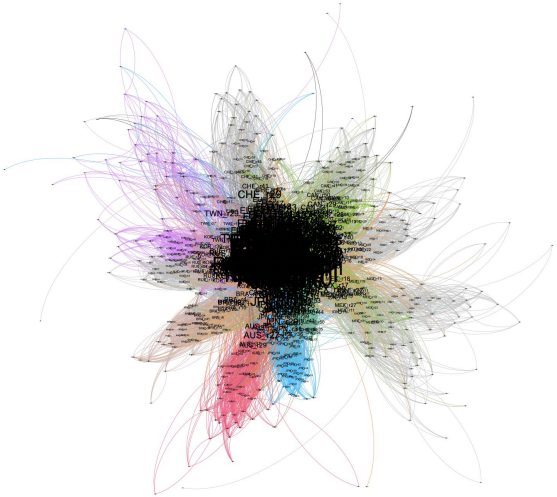
Network Diagram



2000



2009

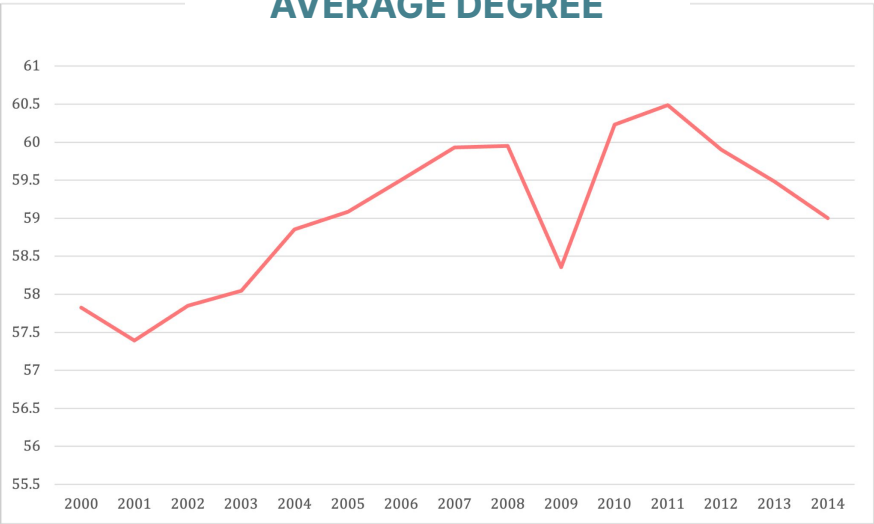


2014

Global financial crisis in 2009 cause the international trade to decrease.

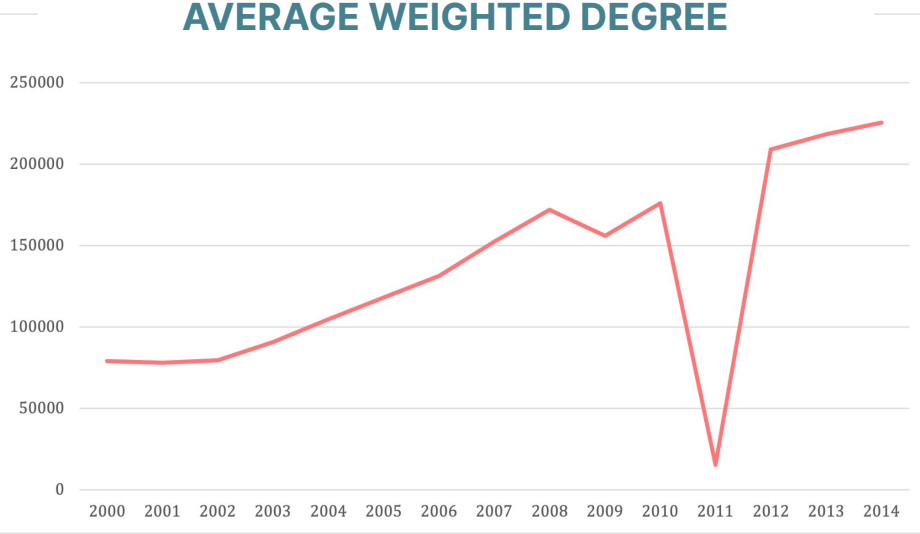
Comparison of main network indicators

AVERAGE DEGREE



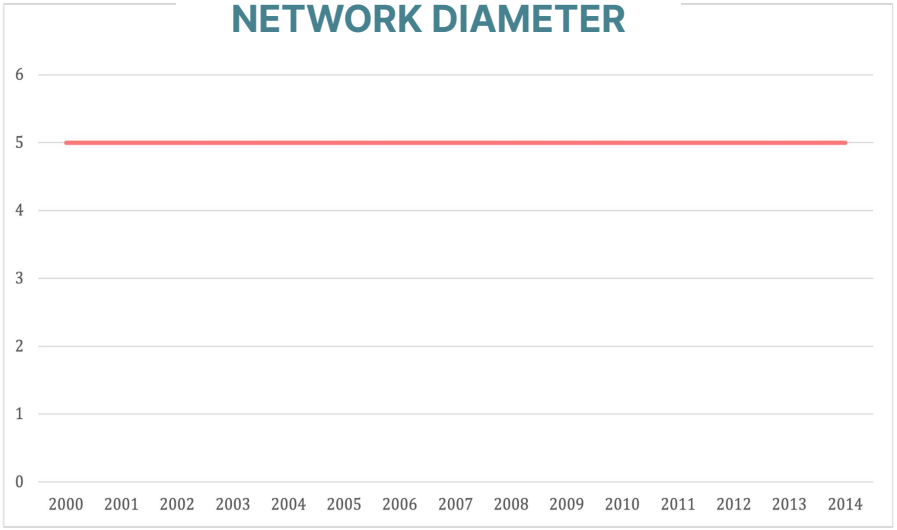
The graph appears rising in overall but in 2009 have a Global Financial Crisis affected the global trade.

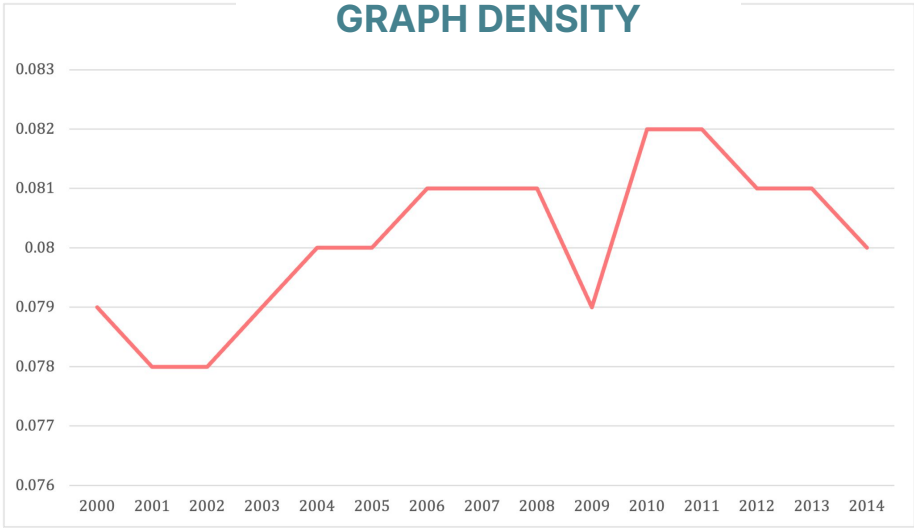
AVERAGE WEIGHTED DEGREE



The general view seems to climb in the same way as the average degree except the financial crisis that caused a plummet in 2011.

Comparison of main network indicators

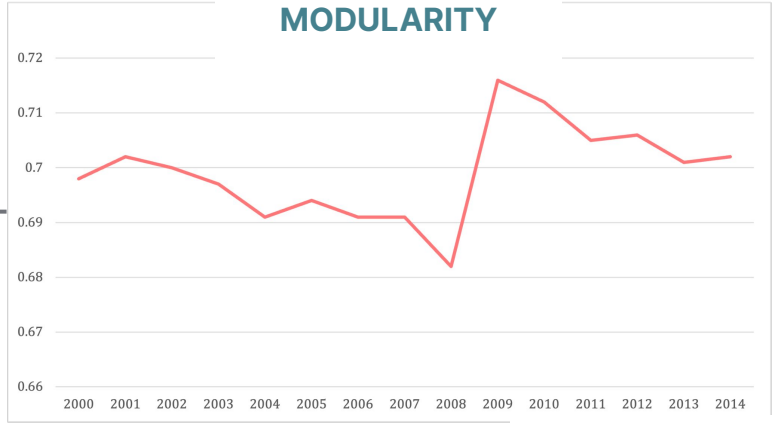




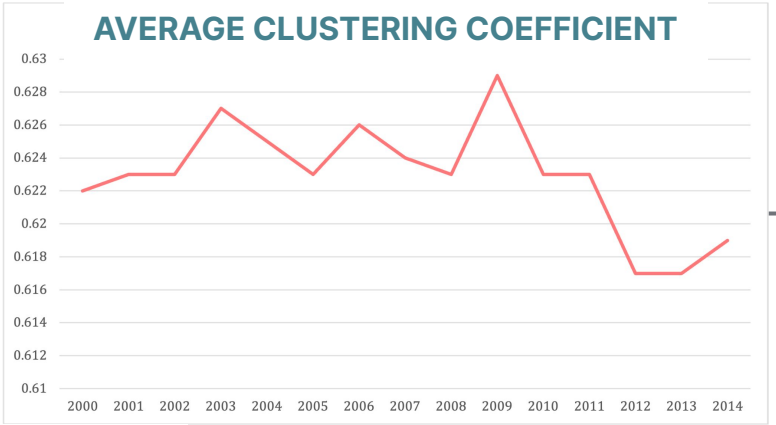
Linear size of a network that remains at 5

Graph density degree is higher and moves with the same pattern except 2009 when the financial crisis occurs.

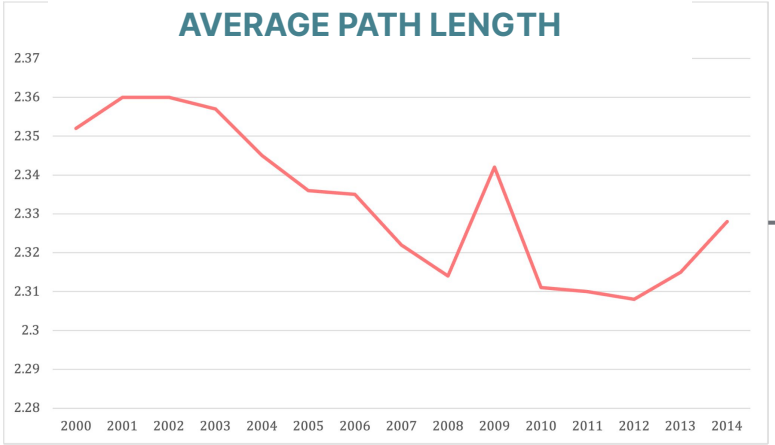
Comparison of main network indicators



Move in inconclusive direction and overall was slightly increase.

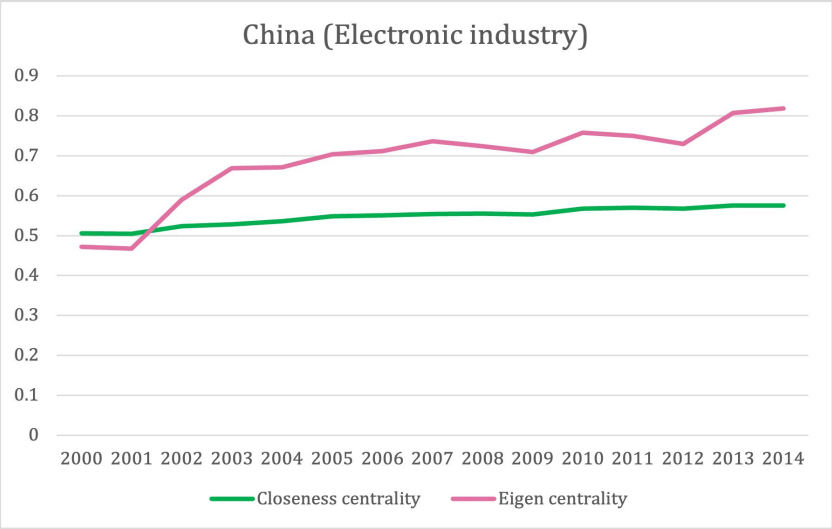


Fluctuate through the period then moderate decrease.

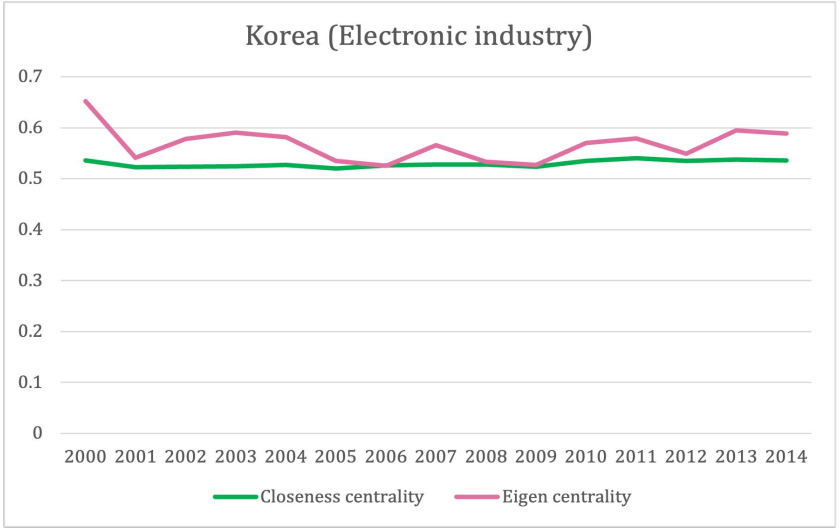


Slightly decrease and move inconclusively.

Comparison of centrality indices of Electronic industry

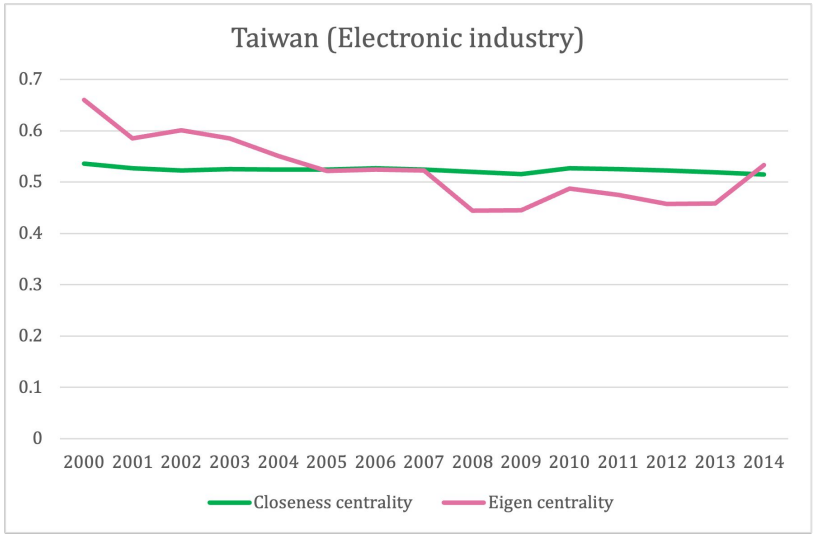


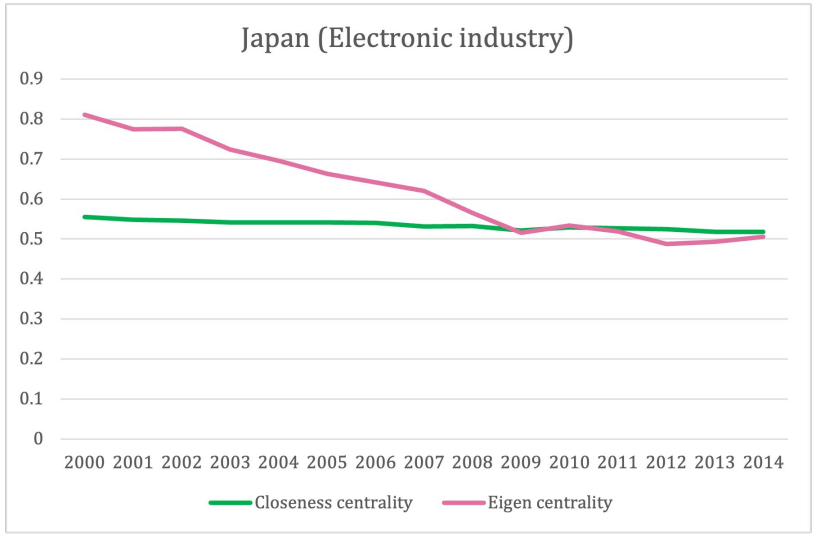
The closeness centrality has slightly increased from 2000-2014. The Eigenvector centrality in China was on an uptrend. Imply that China has wider-reaching influence in the electronic industry.



The closeness centrality is stable from 2000-2014. The Eigenvector centrality has slightly declined and fluctuated over the years. Imply that Korea's reach and influence in the electronic industry is consistent.

Comparison of centrality indices of Electronic industry

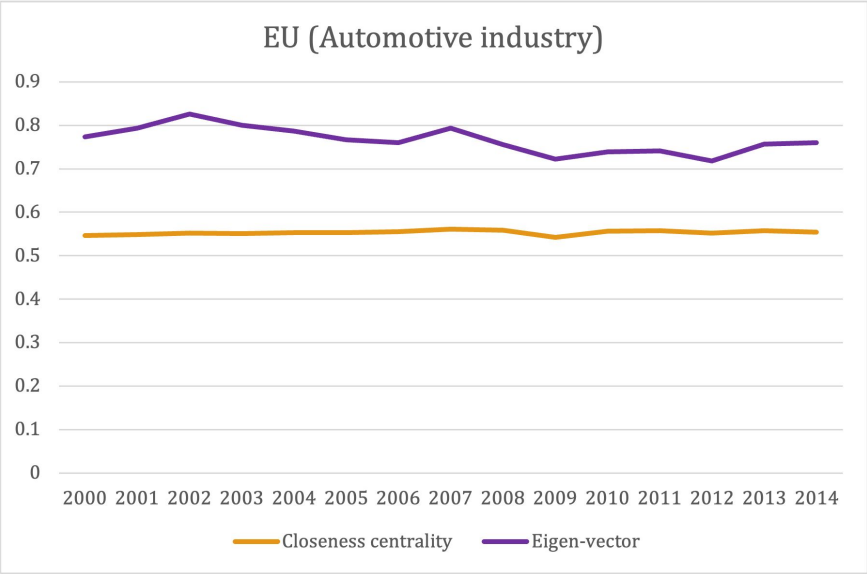


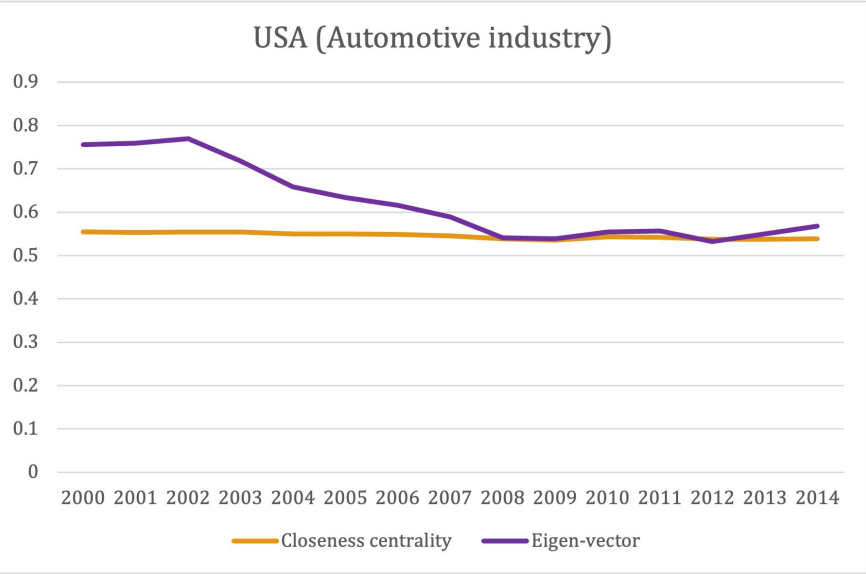


The closeness centrality is mostly stable through a period of time. While Eigenvector centrality was decreased constantly over a decade then a slight increase in 2013. It implies that Taiwan's connectivity in this industry was declining.

The closeness centrality remained the same for the whole period. The Eigenvector centrality has a constant decile after 2009 it remains stable. Imply that Japan's connectivity in this industry was declining.

Comparison of centrality indices of Automotive industry

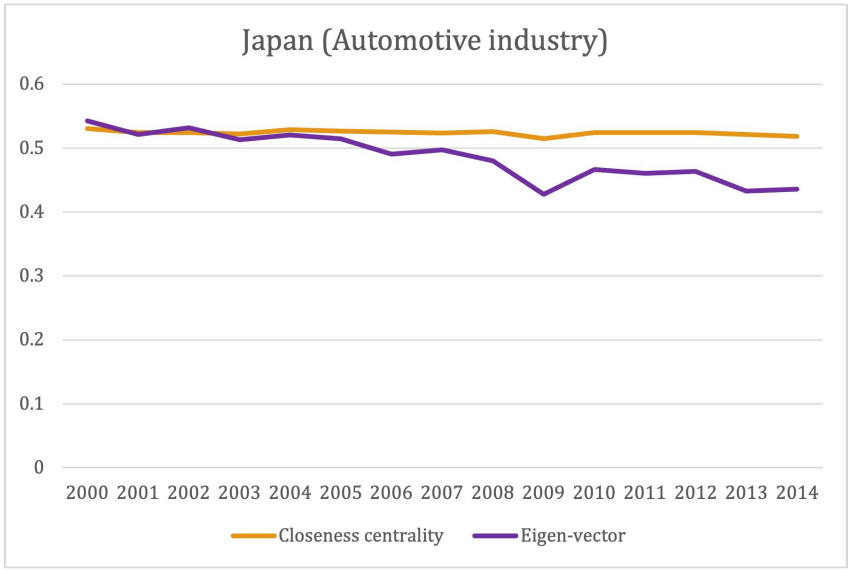


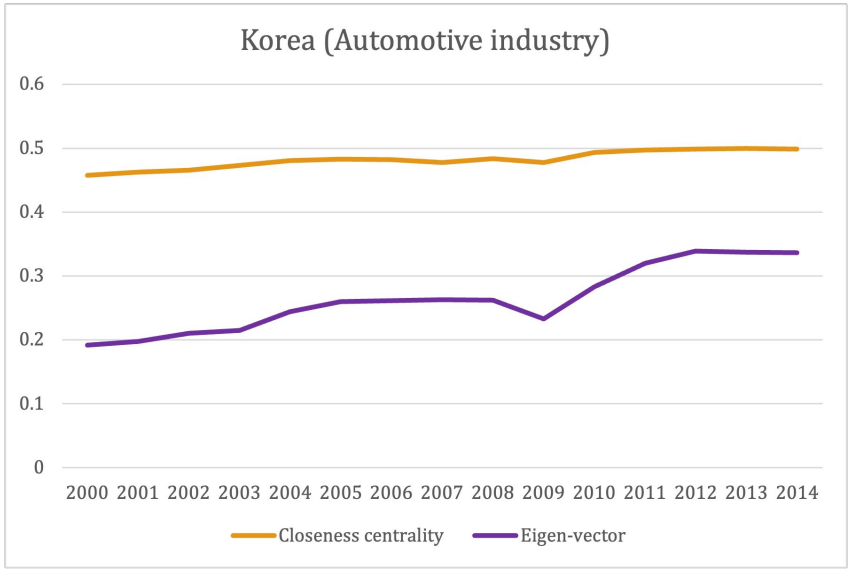


The closeness centrality remained constant from 2000 until 2014, while there was a small change in the Eigenvector centrality during this period. Imply that EU's connectivity in the automotive industry is constant.

The closeness centrality was steady throughout the years. However, the Eigenvector went down moderately, starting to converge the closeness centrality since 2008. Imply that there was a decrease in USA's automotive industry connectivity.

Comparison of centrality indices of Automotive industry





The closeness centrality remained consistent for the whole period. On the other hand, the Eigenvector centrality was declining through most of the time. We can imply that Japan was losing its connectivity.

The closeness centrality was hardly increased, while the Eigenvector rose considerably. It implies that Korea has a higher influence in this industry.

Policy

Electronic industry

Policy implication:

- **Reduce tax rate** for importing and exporting the electronic supplies.
- Government **subsidies**
- **Promote the development** of digital, software, and electrical engineering skills, as well as increasing access to such capabilities across the country.

Automotive industry

Policy implication:

- **Ensure supply chain resilience** for strategic and critical raw material
- **Enabling European SMEs** to better integrate into the global automotive value chain.

Q&A