

Network Analysis and Global Supply Chain

Presented by Group G

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Input-output table use to analyze the relationship

Input-output table provide the information about the industry in every sector

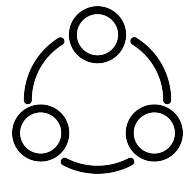
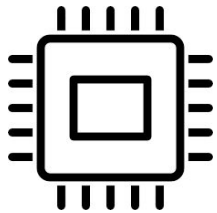
- Electronic industry
- Automotive industry

However, the input-output table cannot visualize



The result from the analysis

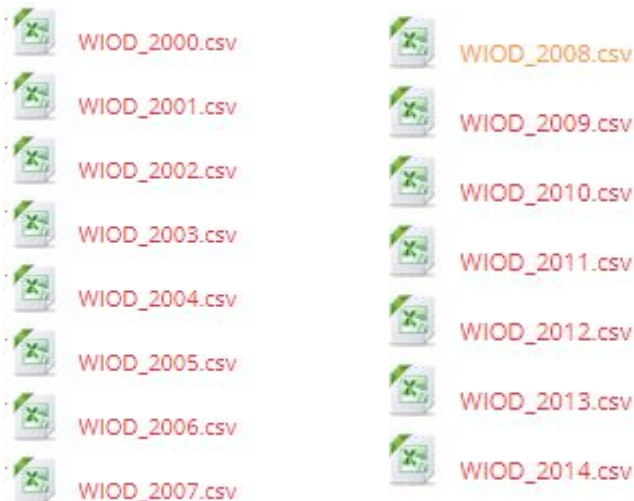
- network graph
- The effect that impact to the world economy
- The centrality indices trend of each country



World Input-output database is the main source of data

We use only one source of data to analyze the information

1 Download the data from WIOD from 2000 to 2014

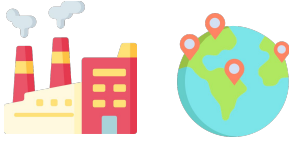


World Input-Output Database

World Input-Output Tables, 2016 Release

WIOD 2000	WIOD 2005	WIOD 2010
WIOD 2001	WIOD 2006	WIOD 2011
WIOD 2002	WIOD 2007	WIOD 2012
WIOD 2003	WIOD 2008	WIOD 2013
WIOD 2004	WIOD 2009	WIOD 2014

Use Gephi and Excel to analyze data



1. Select interesting **industries and countries** to be analyzed

3. Use **Gephi** to calculate data and create visualization



2. Obtain data from **WIOD**

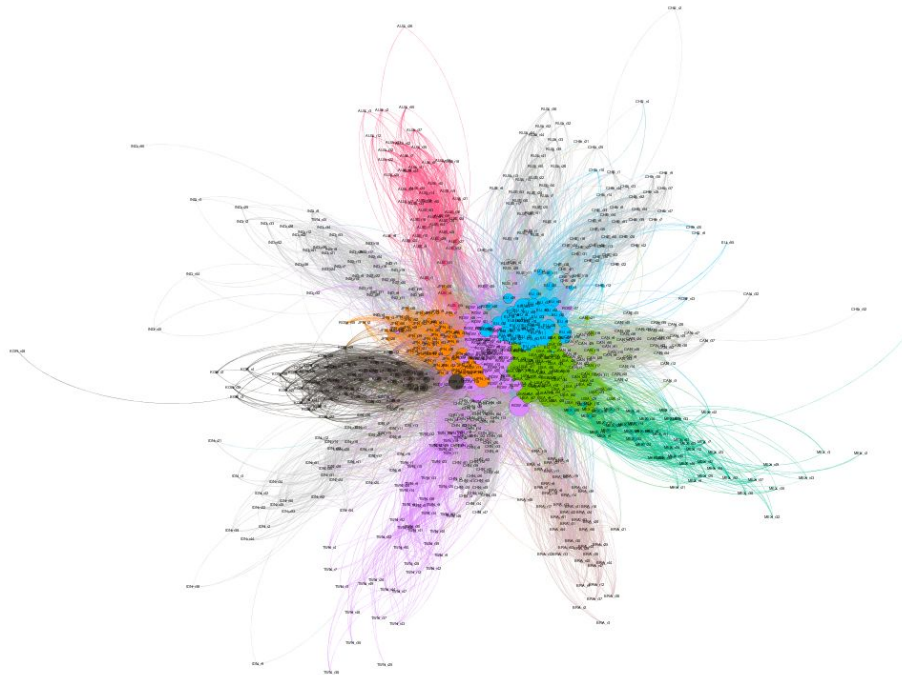


4. Use **Excel** to do a further analysis



We can use gephi to do a network diagram

Year 2000 Network Diagram



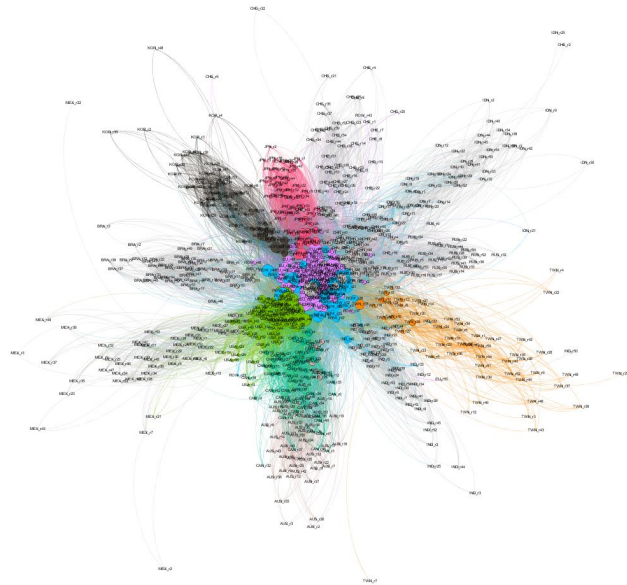
Use Eigenvector Centrality and Modularity

The most central and biggest bubbles: ROWs

By comparing each year, we can tell how the economy evolves over time

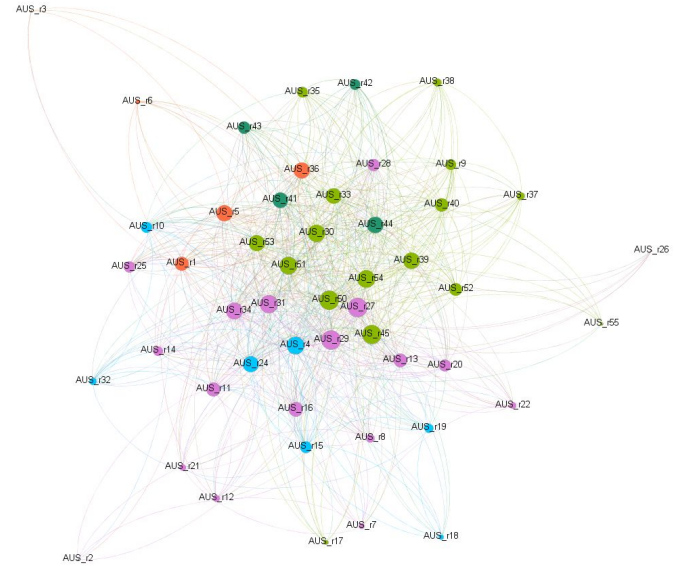
In 2009, there is a global financial crisis

Year 2009 Network Diagram



EU has the most central and biggest bubbles

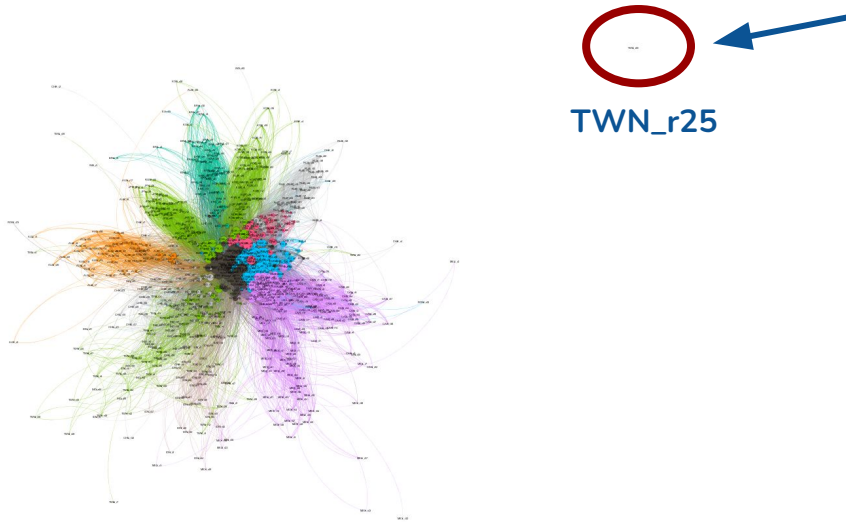
Australia 2009



Most impact sector: r50 (Administrative and Support service)

For 2014 network diagram, there is one sector of one country being left out

Year 2014 Network Diagram

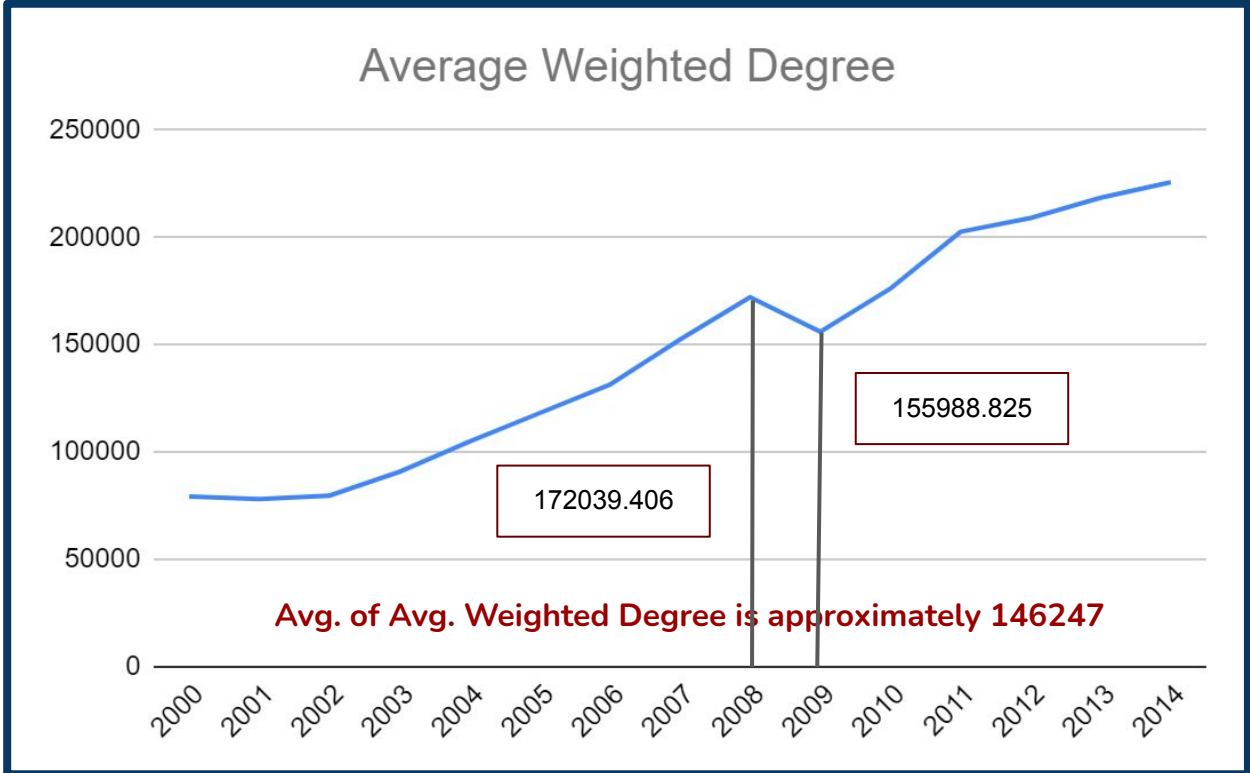
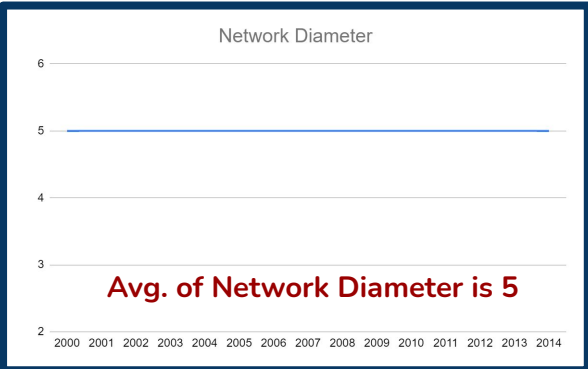
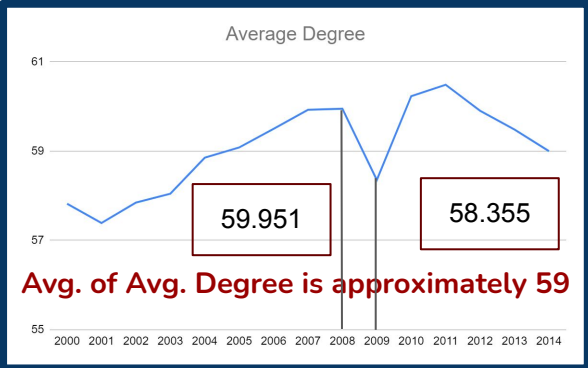


Taiwan's Water Collection Treatment and Supply is being left out from the World data

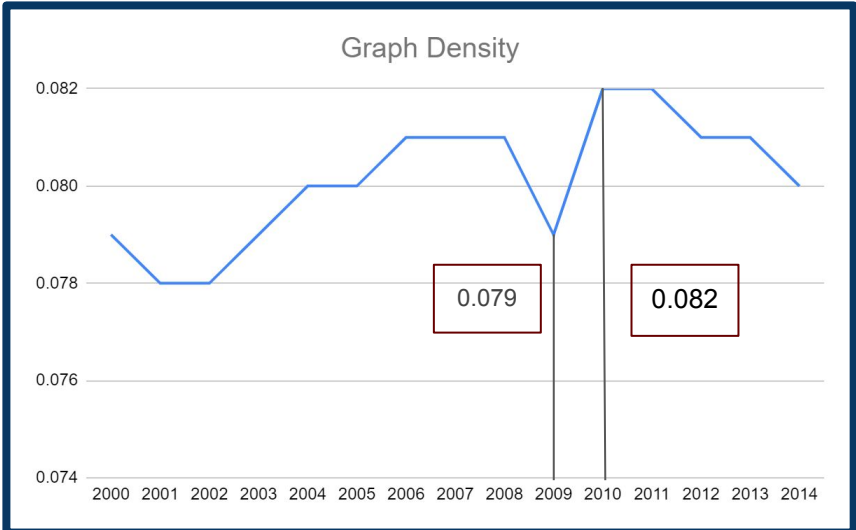
The most recent data that we have

The most central and biggest bubbles: ROWs

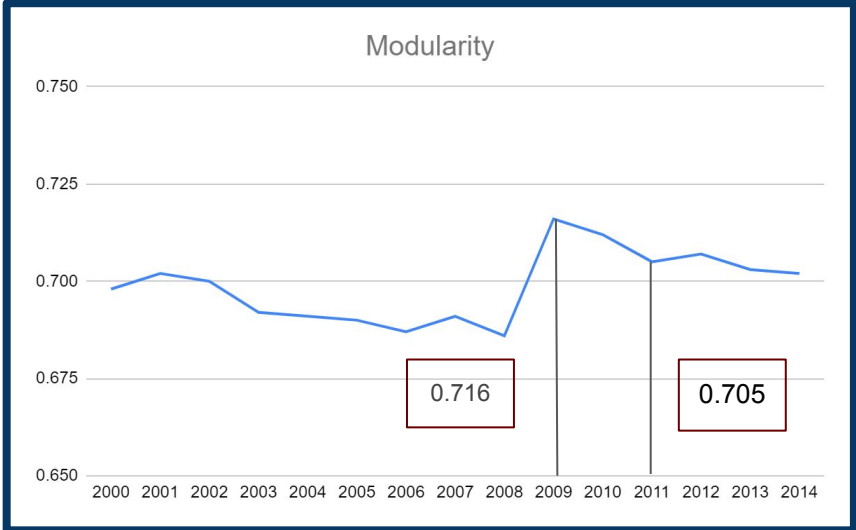
Plot a graph and then it shows how each degree have changed over time



Modularity keep reducing after the global financial crisis in 2009

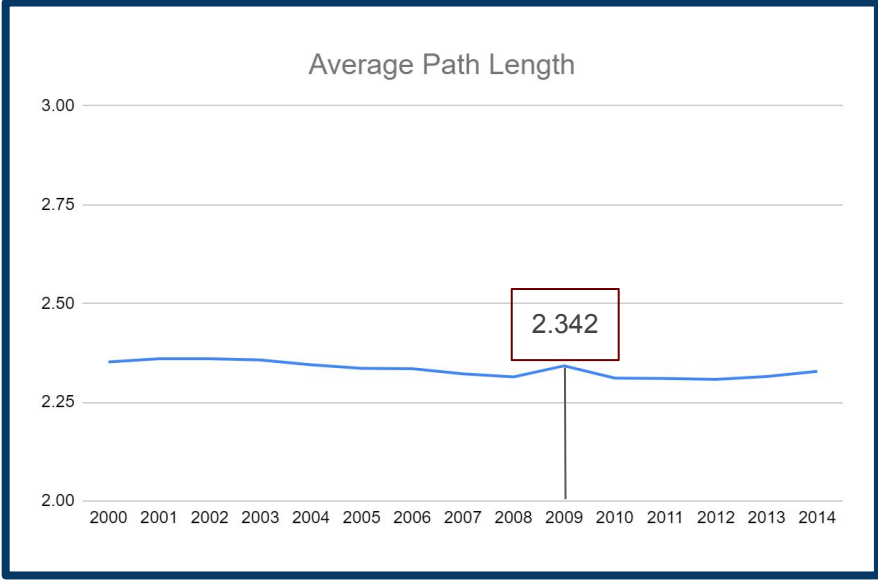
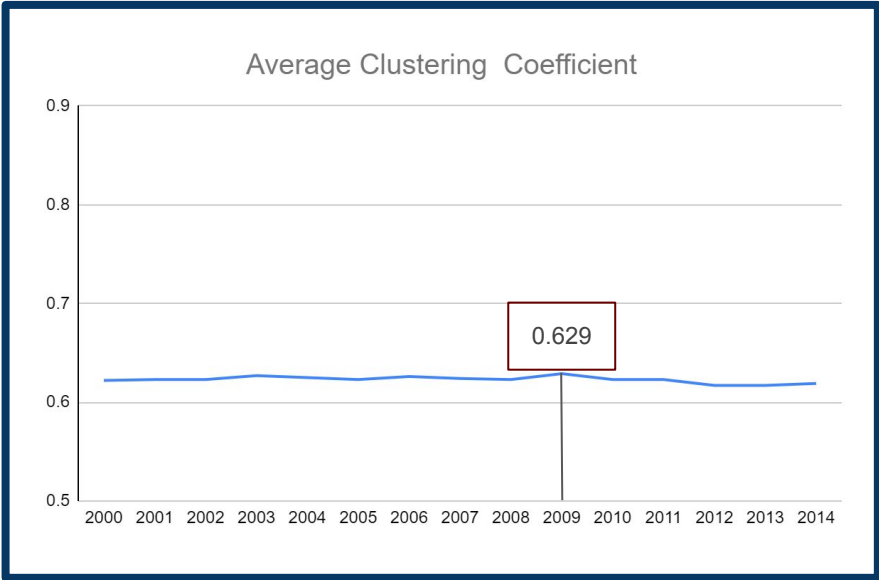


Avg. Graph Density is approximately 0.080



Avg. Modularity is approximately 0.699

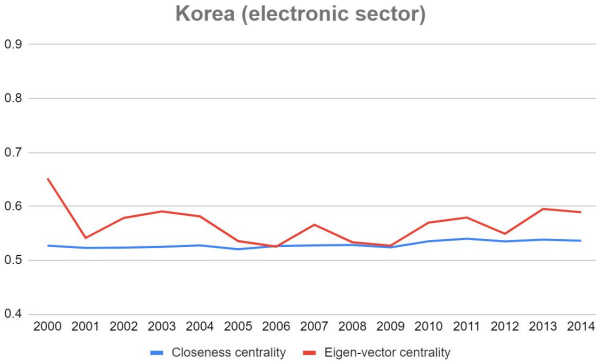
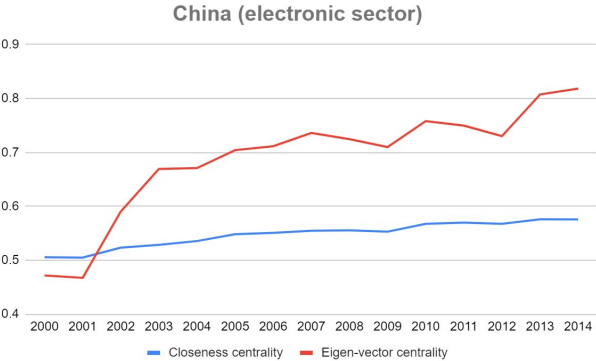
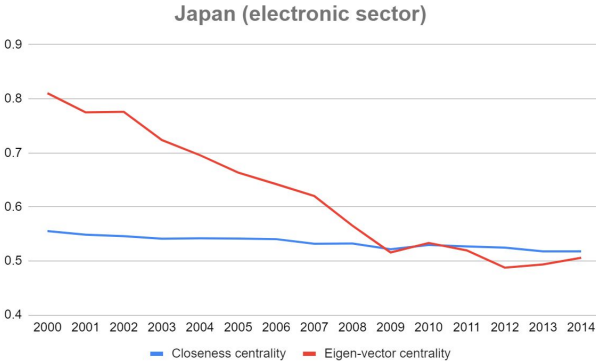
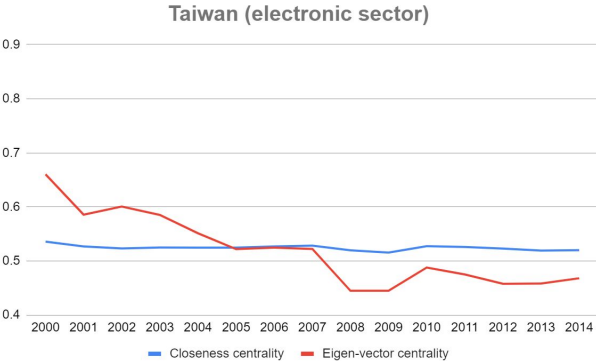
Trends of the Avg. Clustering Coefficient and Avg. Path Length during 2000-2014



Avg. Clustering Coefficient is approximately 0.6

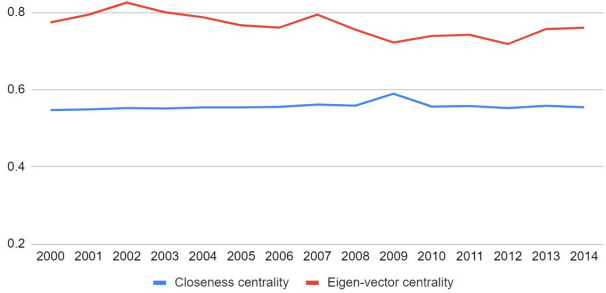
Avg. Path Length is approximately 2.3

Each graph below represents the centrality indices of the major electronic goods exporters.

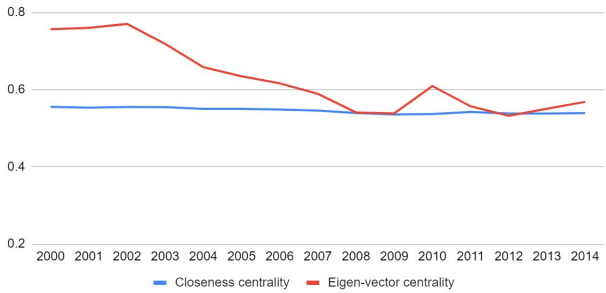


Each graph below represents the centrality indices of the major automotive exporters.

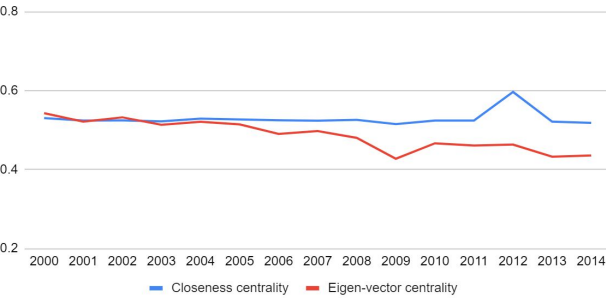
Europe (automotive sector)



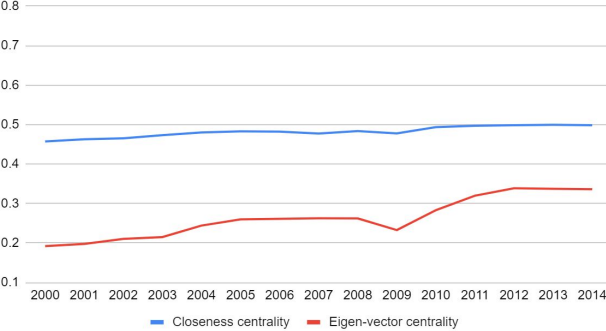
USA (automotive sector)



Japan (automotive sector)



Korea (automotive sector)



Use the result from Gephi and Excel to improve electronics trading among countries

Taiwan



Support domestic workers in electronic sector so that they will not lose out from the production relocation

Japan



Give subsidies to electronic productions

Korea







Lower tax of electronic part of productions and encourage the companies to invest in R&D

China



Lower tax on producing electronic product so that it can attract more electronic producers

Use the result from Gephi and Excel to improve automobile trading among countries

<p>Europe </p> <p>Diversify their vehicle production line to other countries outside of EU</p>	<p>USA </p> <p>Give subsidies for automobile producers to reduce the cost of production and create more advanced technologies</p>
<p>Japan </p> <p>Reduce the export tax so that car producers can export more</p>	<p>Korea </p> <p>Reduce the export tax so that car producer can export more</p>