



Network Analysis And Global Supply Chain

Introduction and project's background

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What is WIOD?

WIOD is a set of the databases series covering 28 EU countries and 15 other major countries in the world for the period from 2000 to 2014.

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- GLOBAL FINANCIAL CRISIS
 - Global financial crisis occurred at the USA between at the end of 2007 and mid-2009.
 - There was a downturn in the US housing market.
 - Many banks around the world incurred large losses and relied on government support to avoid bankruptcy.
- SEMICONDUCTOR CRISIS
 - "Higher prices but fewer options"

GLOBAL FINANCIAL CRISIS

2000

2007

2009

2014

SEMICONDUCTOR CRISIS

2020

2021

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**WIOD :
THE WORLD
INPUT-OUTPUT
DATABASE
FOR THE PERIOD
FROM 2000 TO
2014**

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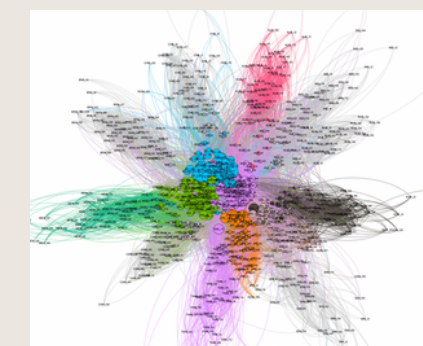
Analytical Methodology

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EU_15	EU_15	138	788087.700885	3	0.542808	0.587052	0.00814	
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IND_15	IND_15	37	30251.901887	4	0.440283	0.470375	0.002482	
IND_158	IND_158	20	7958.78957	4	0.419042	0.445011	0.000455	

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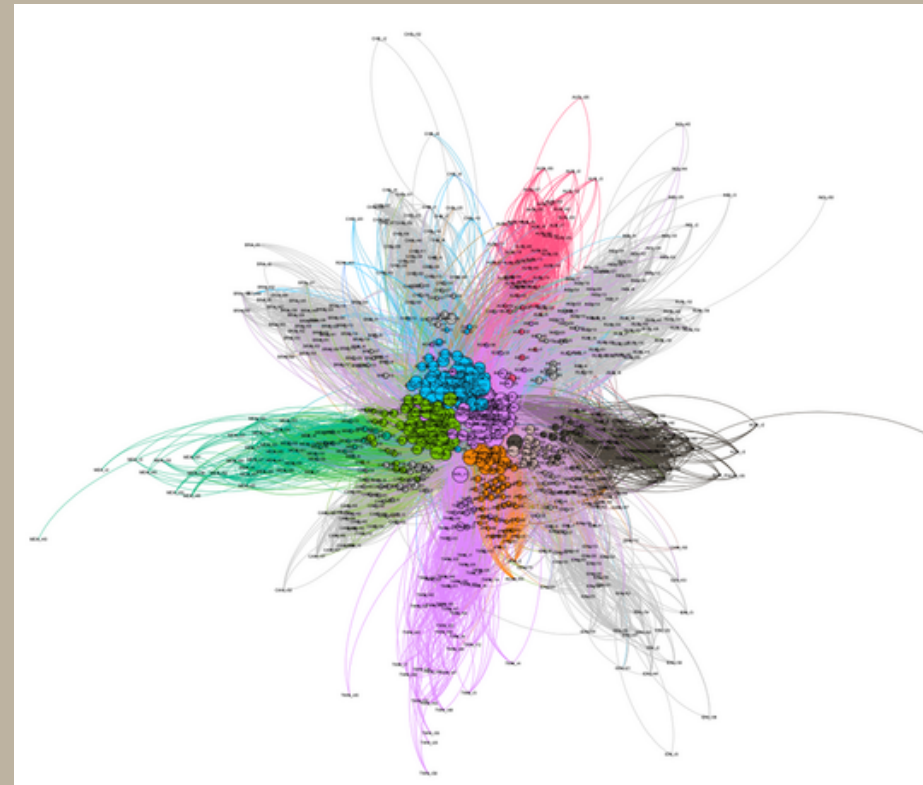
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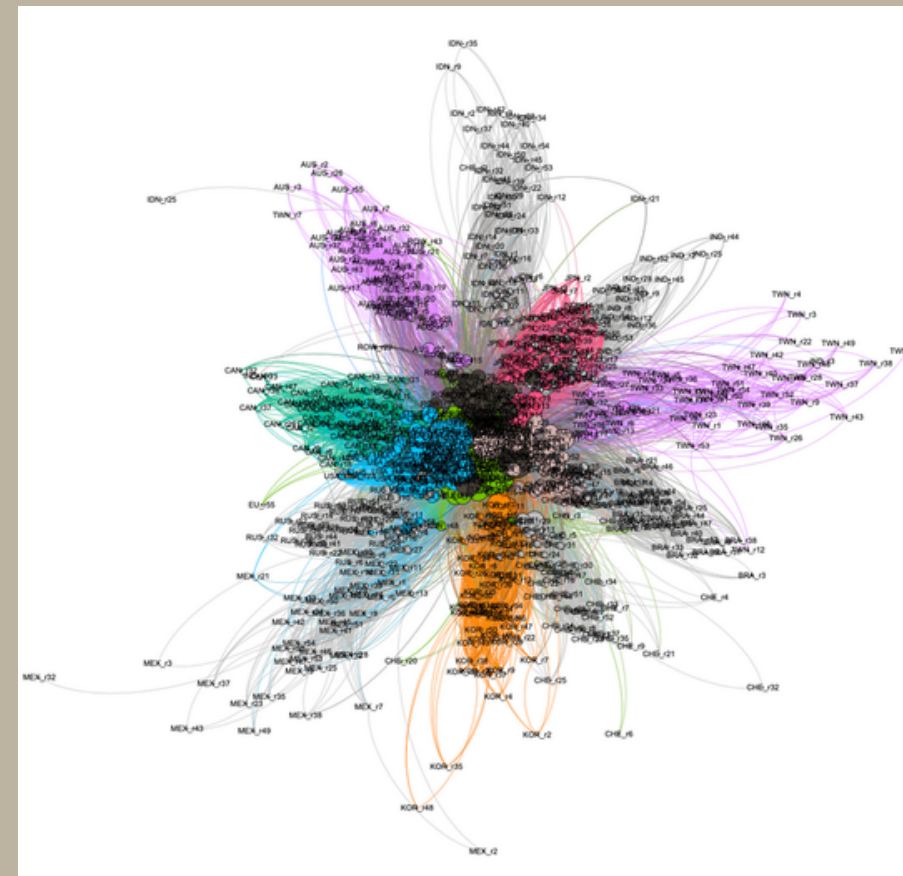
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Results: Comparison of main network indicators

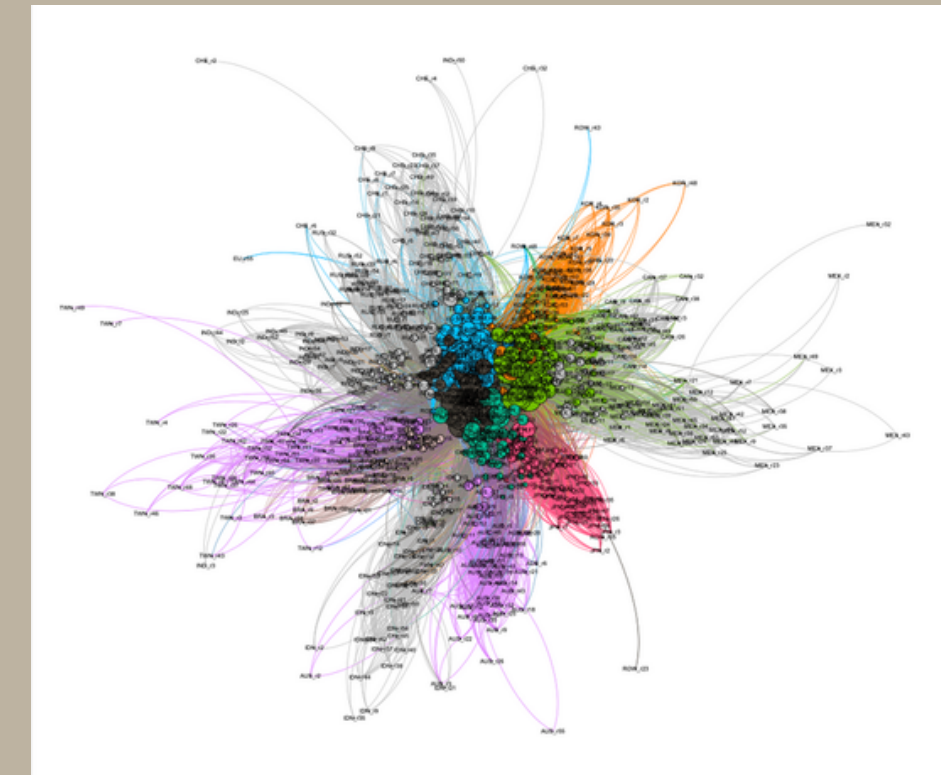
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NETWORK DIAMETER 2000



NETWORK DIAMETER 2009



NETWORK DIAMETER 2014

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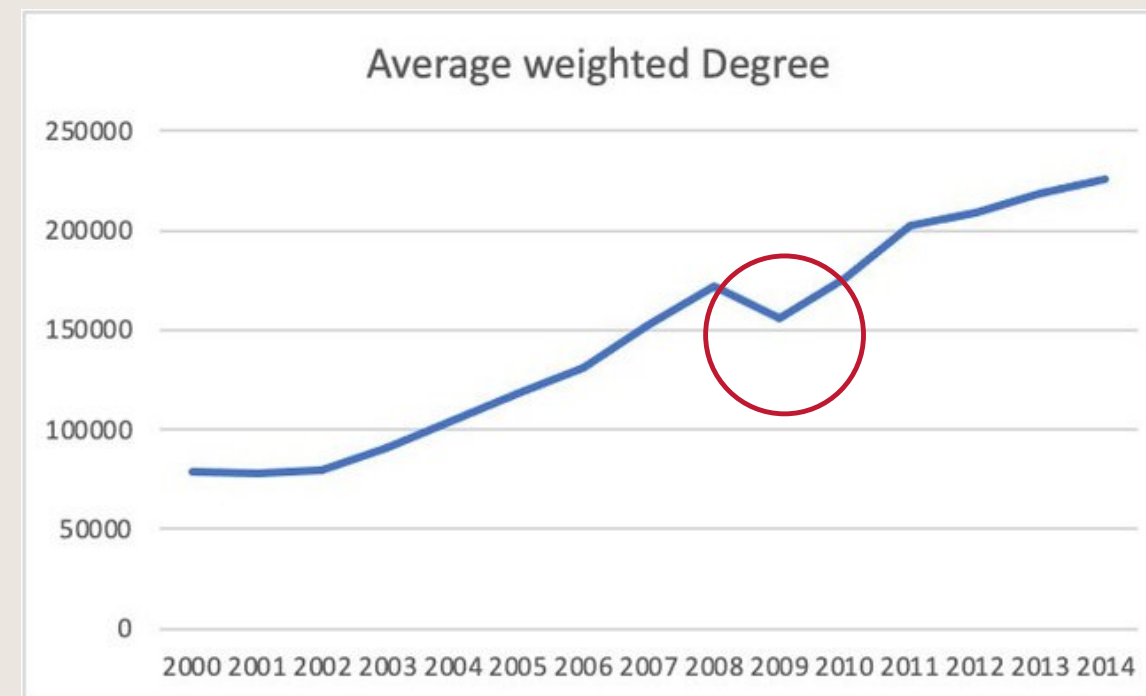
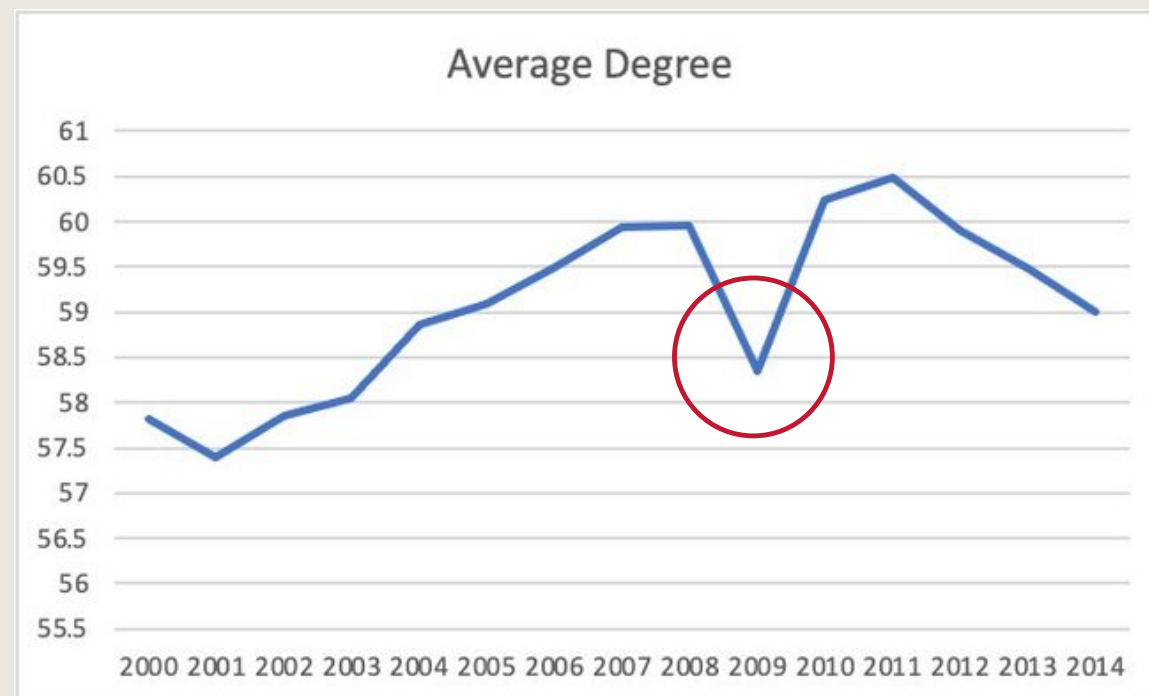
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CONCLUSION

- Average degree
 - In 2011, there are highest average number of edges connected to a node which is 60.488
 - During 2009, the average degree is dramatically drop due to financial crisis.
- Average weighted Degree
 - Between 2000 and 2008, the average weighted degree is increase and drop in 2009, then it is continuously until 2014

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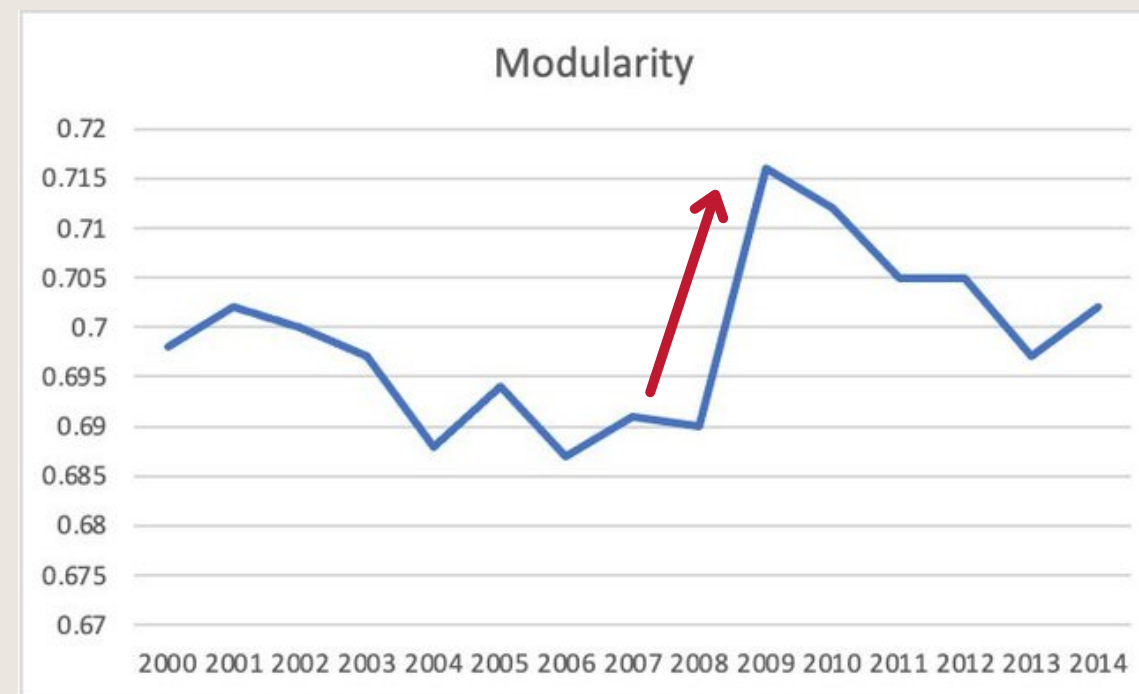
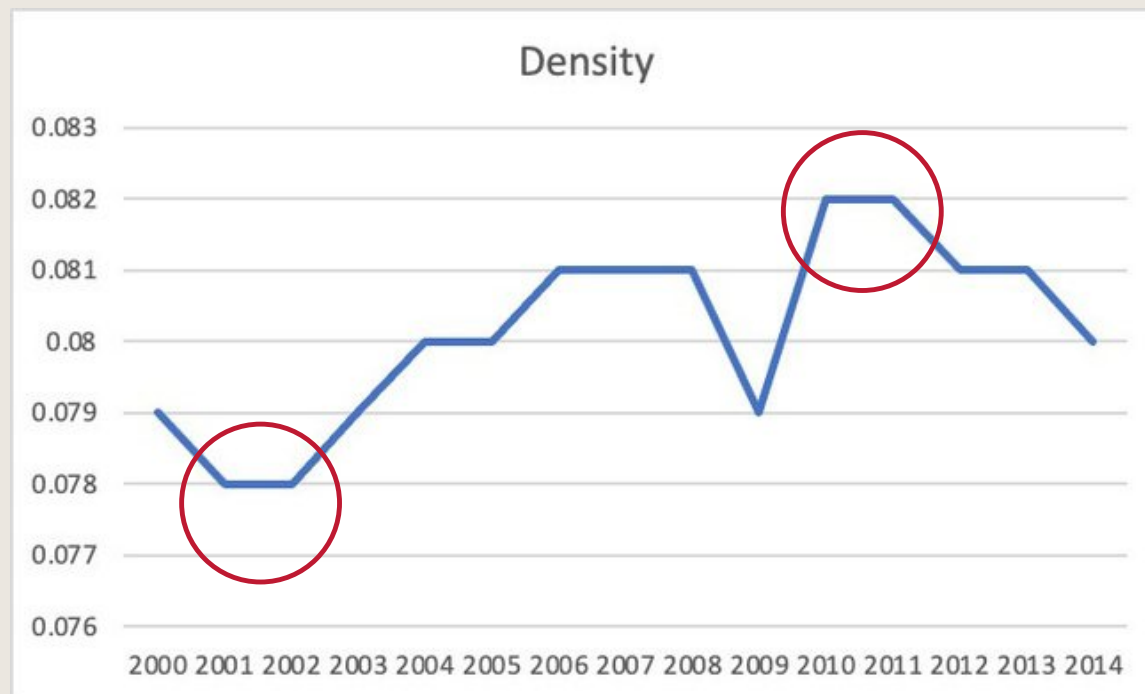
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CONCLUSION

- Graph Density
 - During 2010 and 2011, the graph density is 0.082 which is a highest graph density while the lowest graph density is 0.078 in the year 2001 and 2002.
- Modularity
 - The modularity is fluctuate between 2000 and 2014.
 - In 2009, it is dramatically increase and then decrease until 2013.

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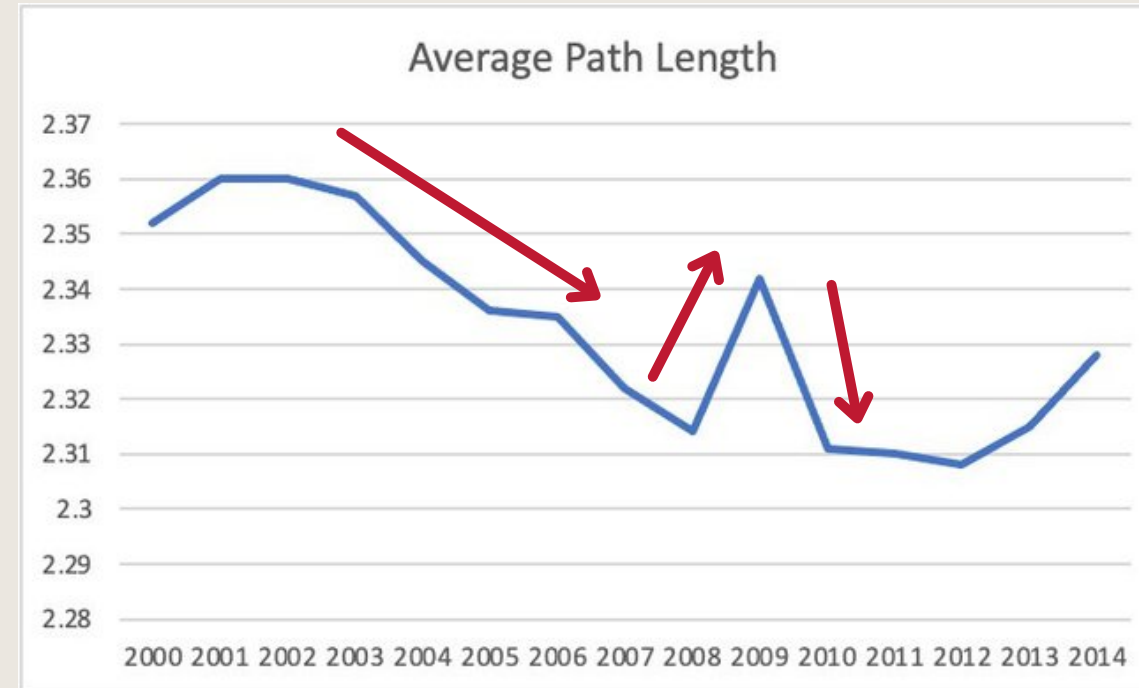
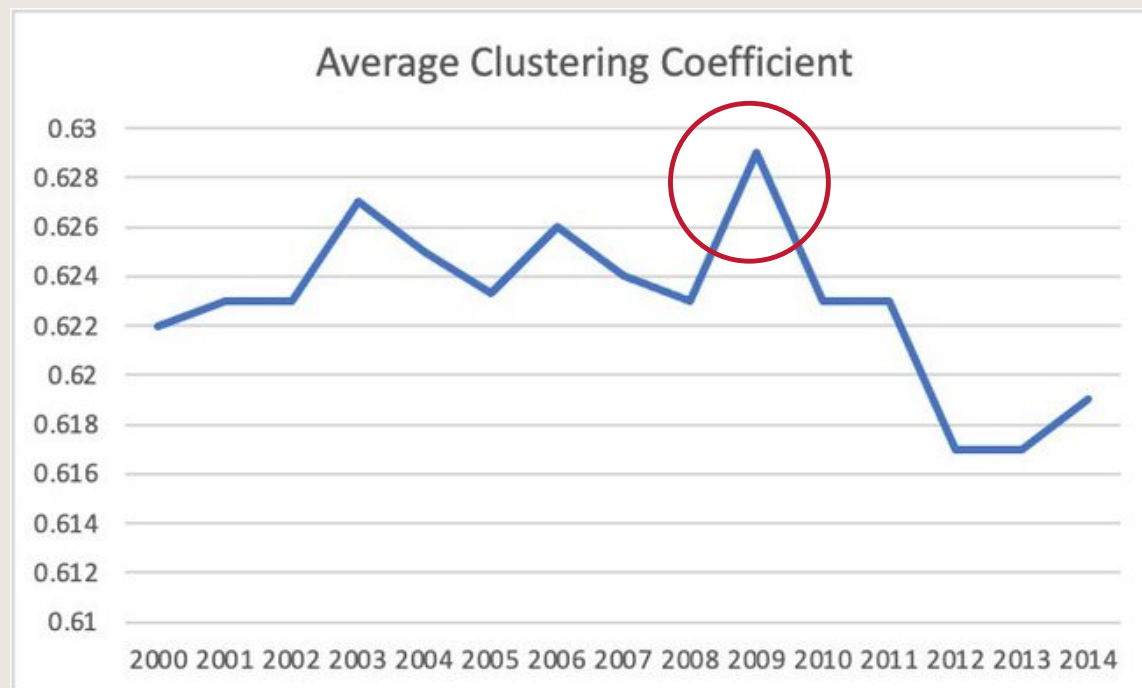
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CONCLUSION

- Average Clustering Coefficient
 - The peak average clustering coefficient is in 2009 which is 0.629
- Average Path Length
 - Since 2000 until 2008, the average path length is decreasing and then it is significantly increasing between 2008 and 2010 and dropping again after 2009.

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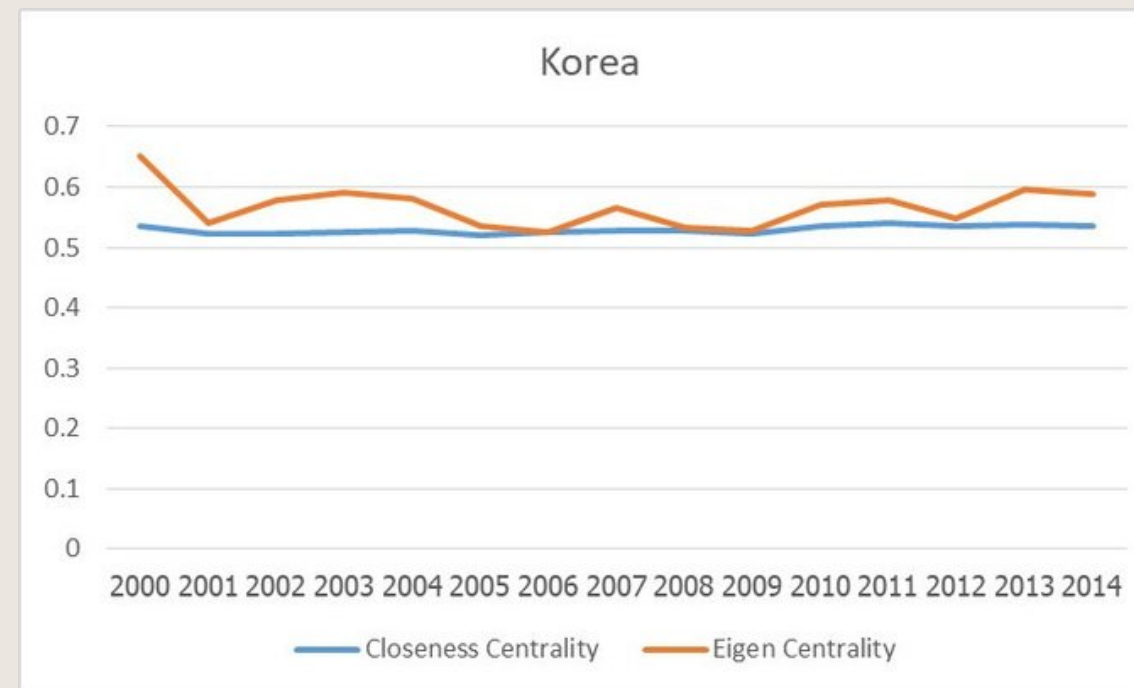
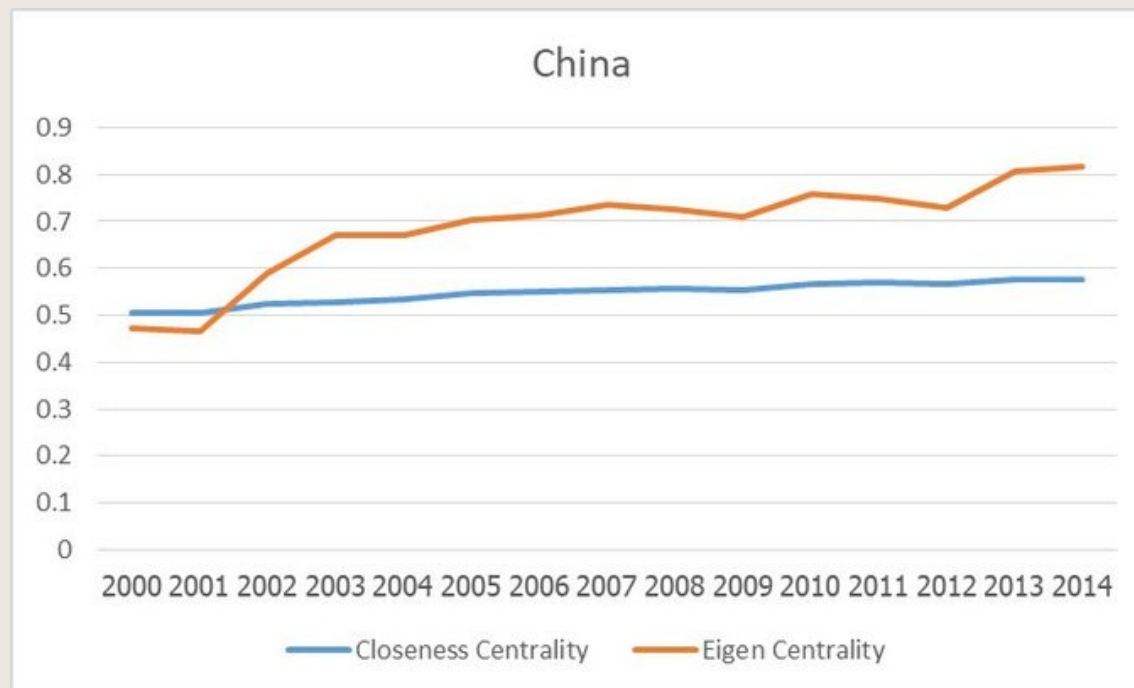
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Conclusion

- For China, both indicators are moving in the same direction.
- For Korea, Eigen centrality is volatile but closeness centrality is stable.

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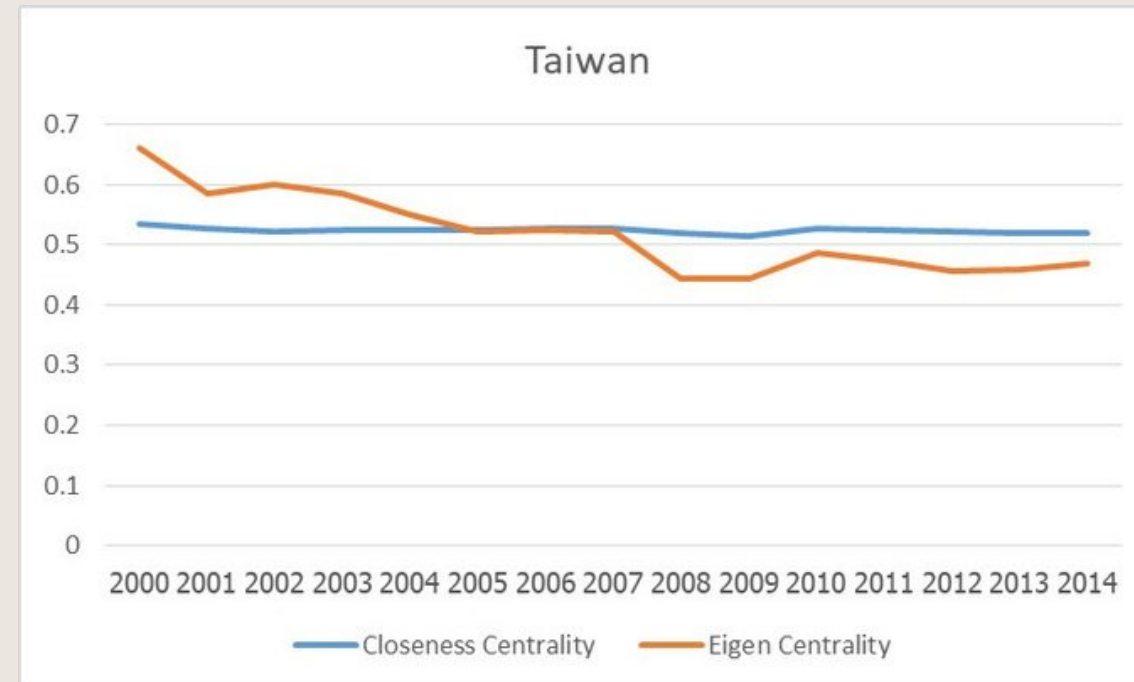
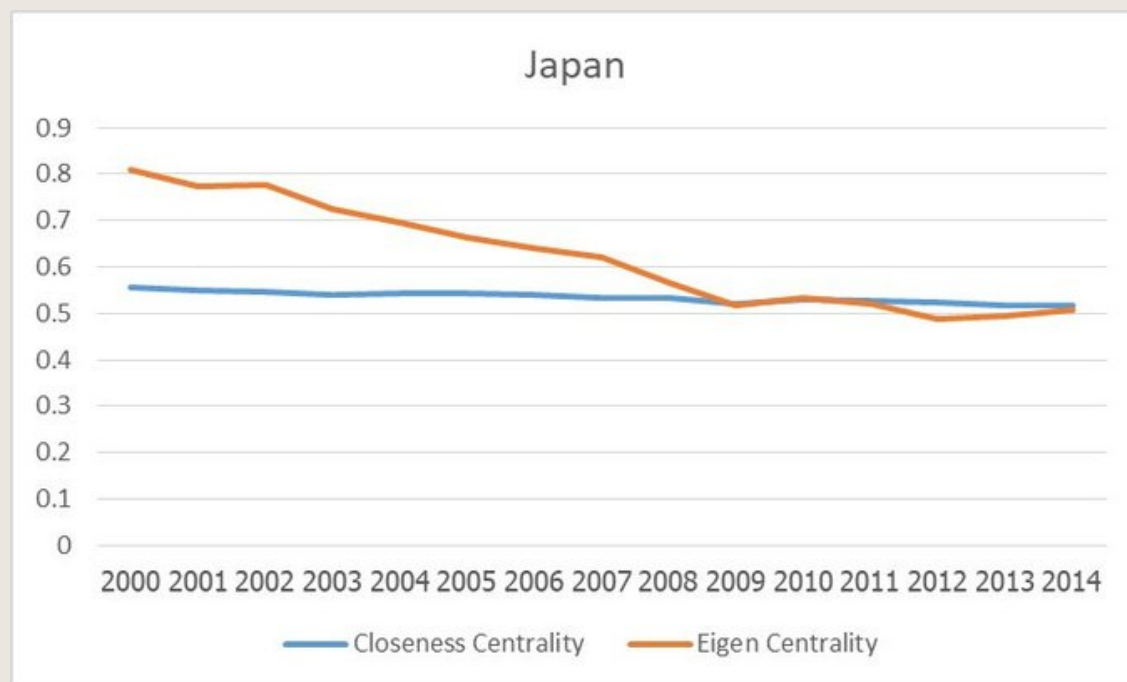
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Conclusion

- For Japan, Eigencentrality is quite volatile while closeness centrality is stable.
- For Taiwan, both indicators are same like Japan. Closeness centrality is stable but Eigen centrality is volatile.
- So, both indicators for Japan and Taiwan are inconclusive direction.

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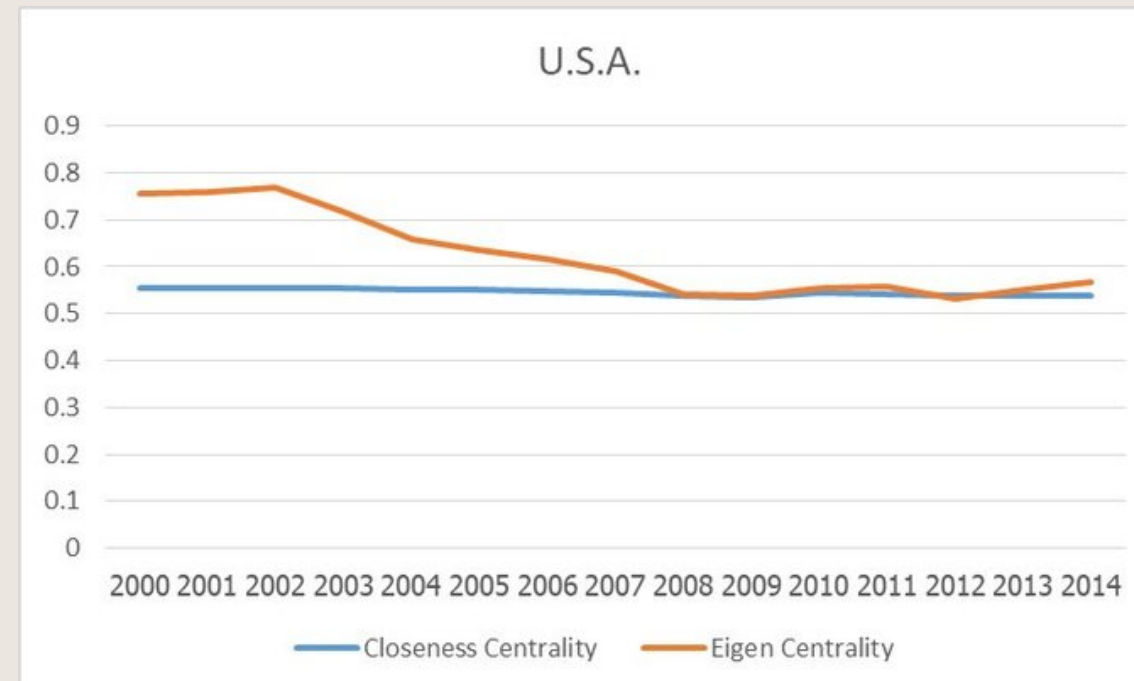
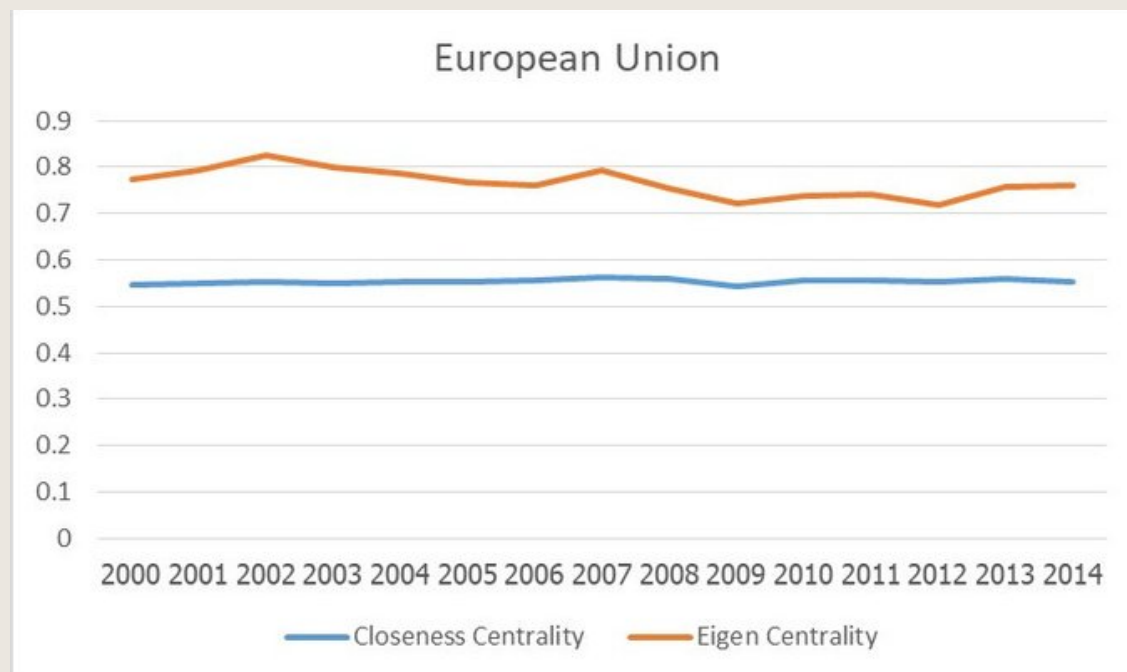
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Conclusion

- For EU, both indicators seem to move in the same direction.
- For U.S.A, both indicators are not moving in the same direction.

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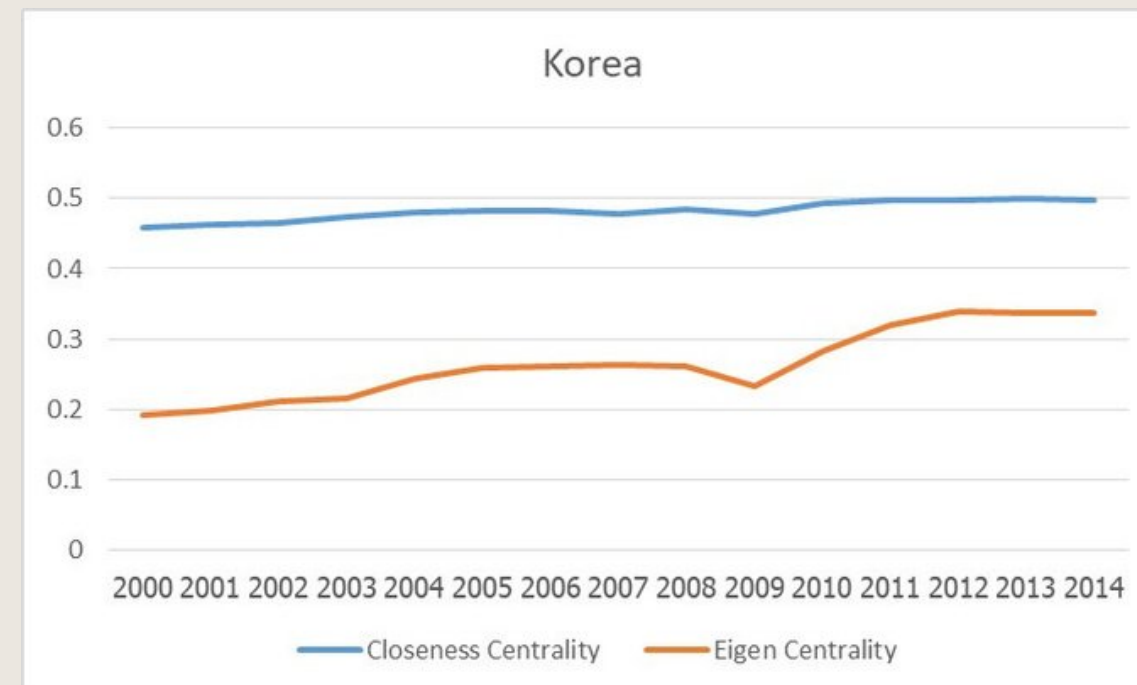
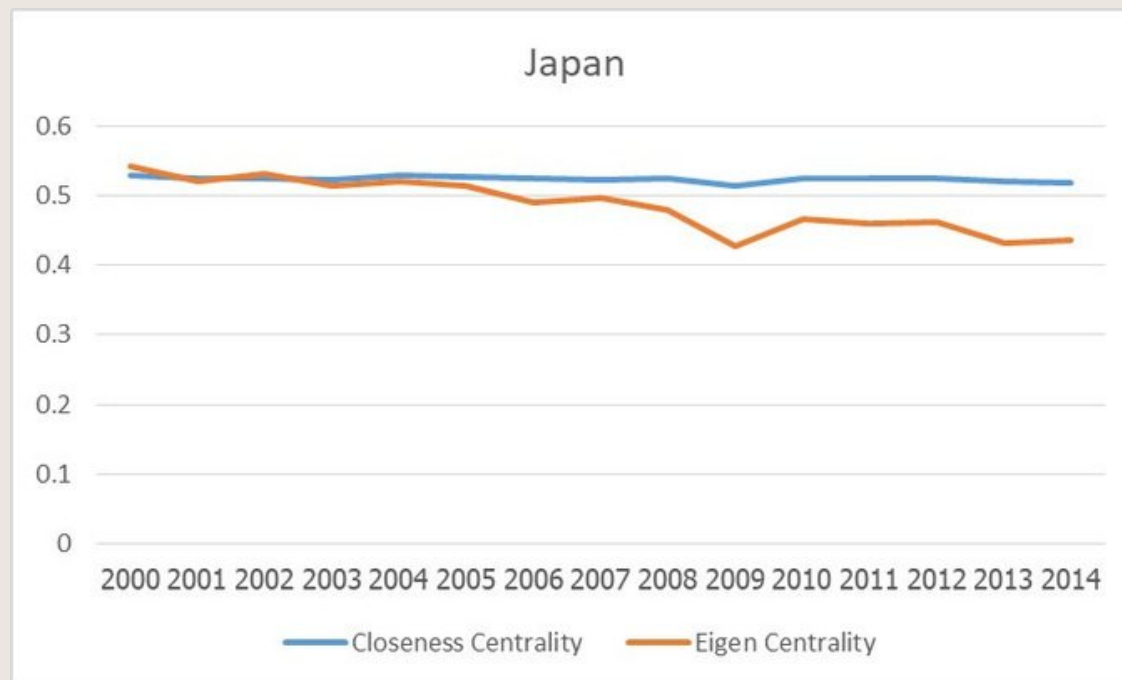
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Conclusion

- For Japan, both indicators are not moving in the same direction.
- For Korea, both indicators are moving in the same direction.

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Summary & Policy Recommendations

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- Automotive industry seems to be prioritized as the most important in the European Union comparing to USA, Japan, and Korea.
- Korea originated at the lowest in automotive exporters comparing to those 3 countries and increase significantly since 2009. On the other hand, Eigen-vector centrality of USA and Japan slightly declined since 2008 and 2005 respectively. USA and Japan should create a culture of quality.
- As we are living in technological-based society, to stabilize the industry, all countries should improve their inventory planning in order to prevent the unexpected situation in the future. (ex, semiconductor crisis during 2020-2021).

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Thank you!

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