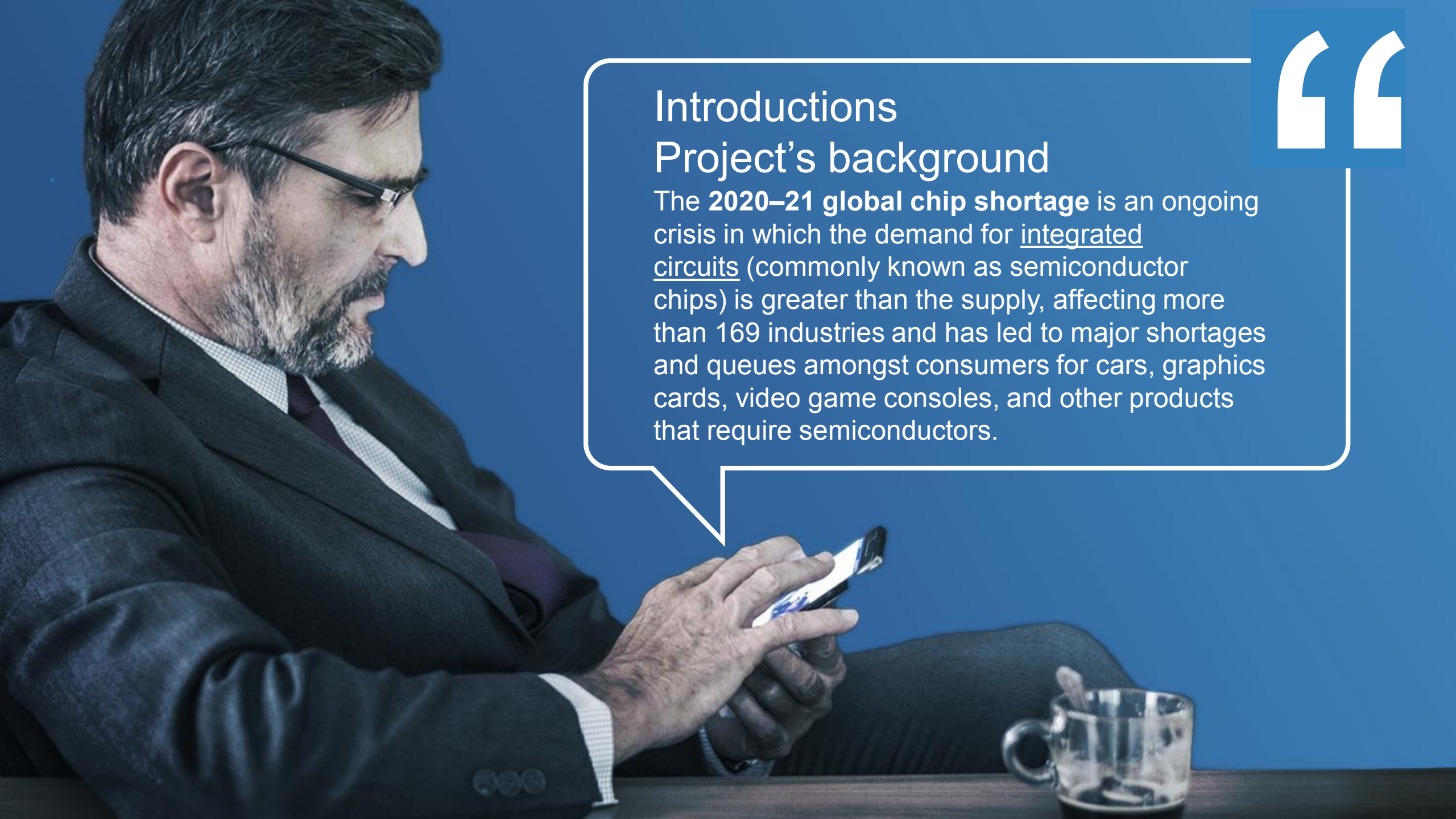




NETWORK ANALYSIS AND GLOBAL SUPPLY CHAIN

Lecture by
Nattapong Puttanapong, Ph.D

EE406: CONTEMPORARY ECONOMIC ISSUES (SEMESTER 1/2021)

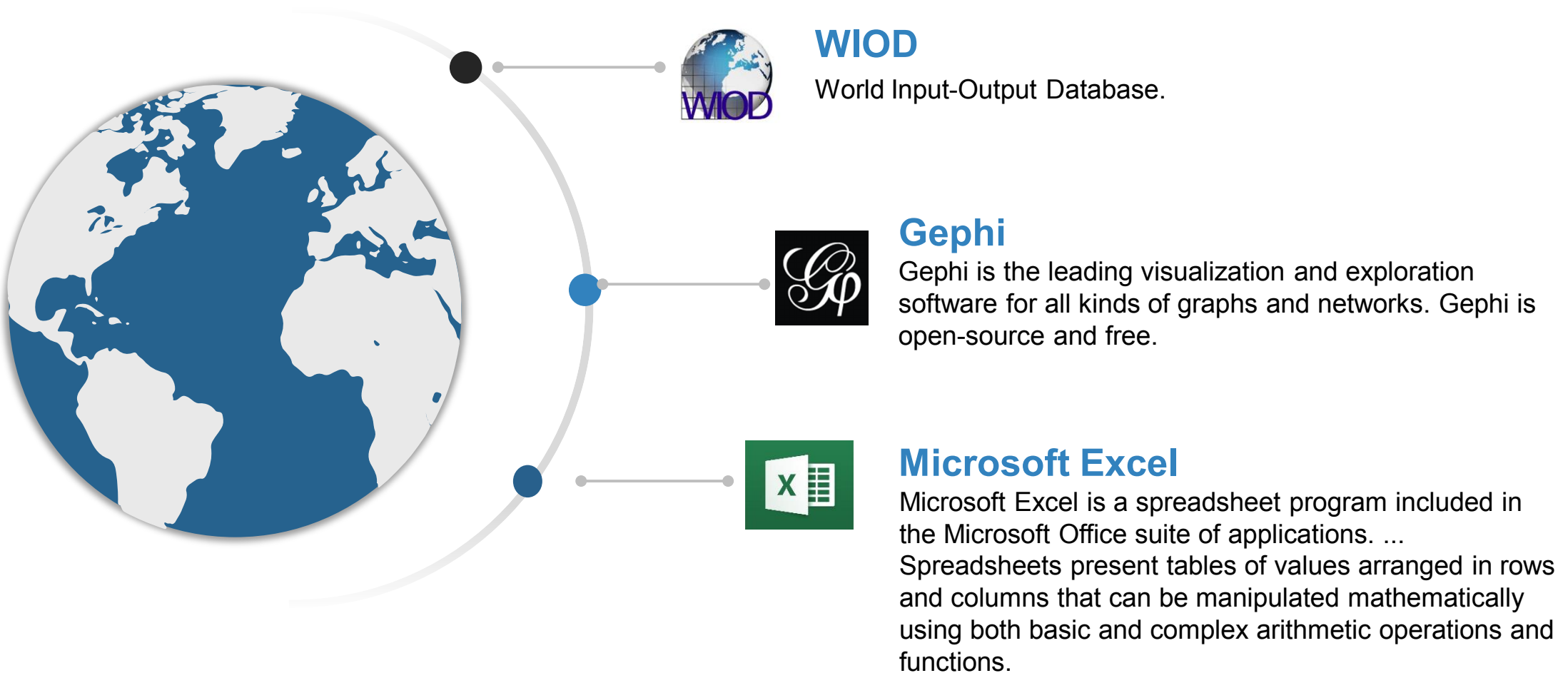


Introductions

Project's background

The **2020–21 global chip shortage** is an ongoing crisis in which the demand for integrated circuits (commonly known as semiconductor chips) is greater than the supply, affecting more than 169 industries and has led to major shortages and queues amongst consumers for cars, graphics cards, video game consoles, and other products that require semiconductors.

Sources of Data and Tools



1

Filters **Statistics** **Settings**

Network Overview

Average Degree 57.848 Run ?

Avg. Weighted Degree 79584.563 Run ?

Network Diameter 5 Run ?

Graph Density 0.078 Run ?

HITS Run ?

Modularity 0.7 Run ?

PageRank Run ?

Connected Components 1 Run ?

Node Overview

Avg. Clustering Coefficient 0.623 Run ?

Eigenvector Centrality Run ?

Edge Overview

Avg. Path Length 2.36 Run ?

Dynamic

Nodes Run ?

Edges Run ?

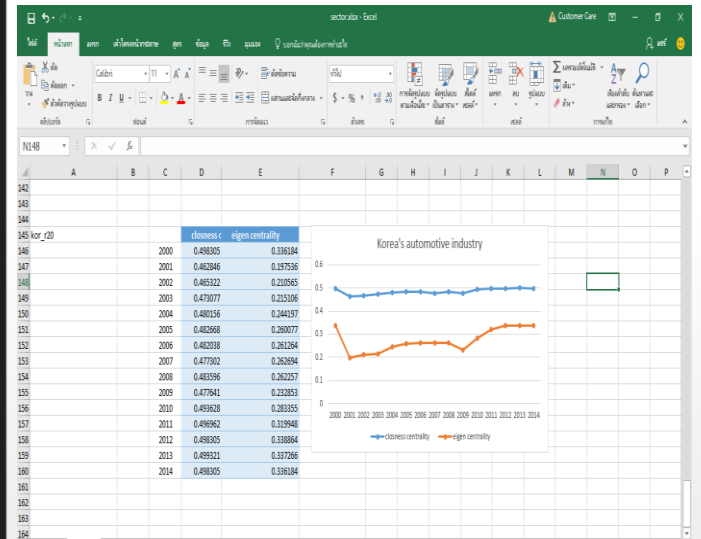
Degree Run ?

Clustering Coefficient Run ?

Analytical Methodologies

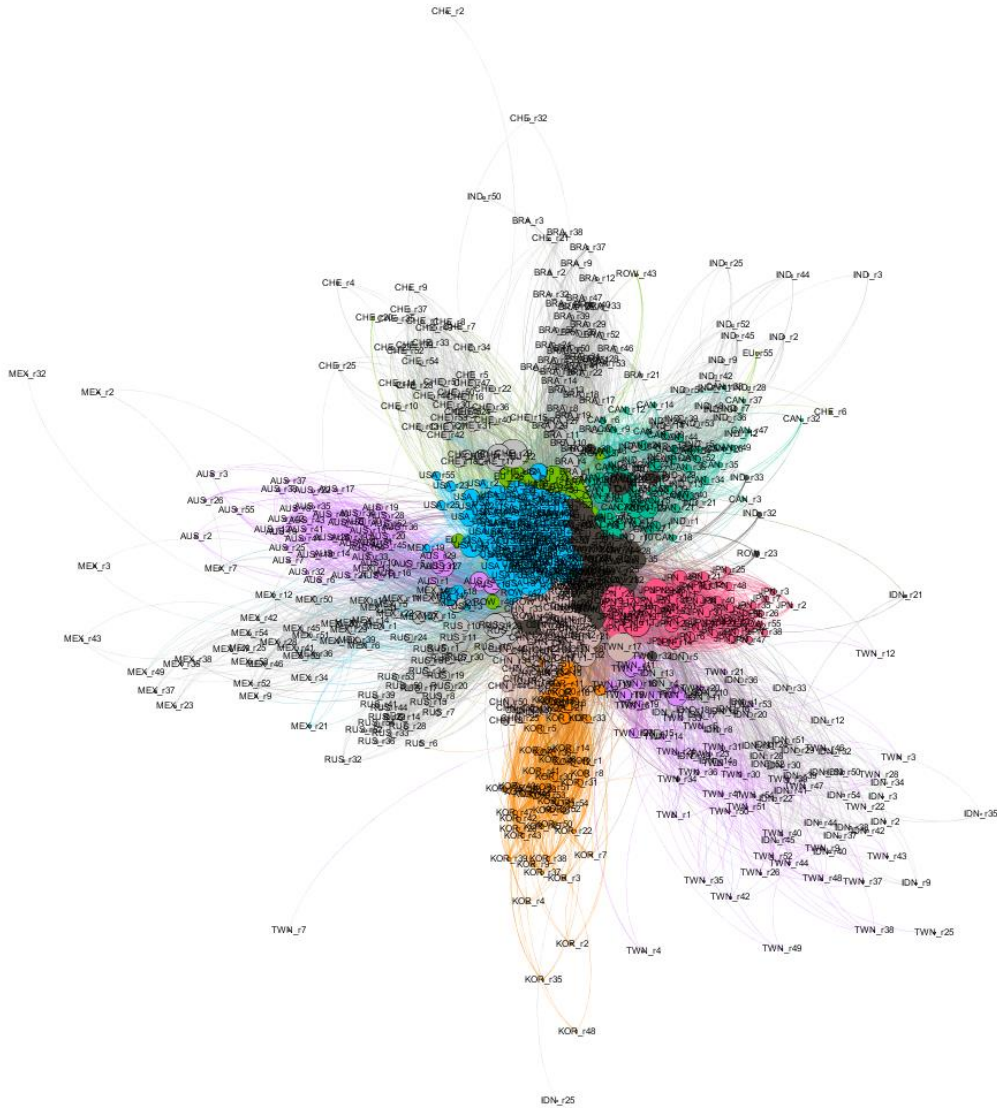
Nodes	Edges	Configuration	Add node	Add edge	Search Nodes	Import Spreadsheet	Export table	More actions	Filter:	Id					
Id	Label	Timestamp	Degree	Weighted De...	Eccentricity	Closeness	Harmonic Closeness	Betweenness Cent...	Authority	Hub	Modularity...	PageRank	Component...	Clustering Coeff...	Number of its...
AL5_1	AL5_1	58	13015.195248	3.0	0.467889	0.510807	0.005347	0.015365	0.015365	2	0.001495	0	0.360226	575	
AL5_2	AL5_2	7	1369.136794	4.0	0.324339	0.346368	0.000003	0.000380	0.000380	2	0.000387	0	0.666667	34	
AL5_3	AL5_3	6	759.970937	4.0	0.311536	0.346432	0.0	0.000603	0.000603	2	0.000337	0	1.0	15	
AL5_5	AL5_5	16	40581.808994	4.0	0.446461	0.449432	0.000329	0.000337	0.000337	2	0.001263	0	0.42348	626	
AL5_6	AL5_6	16	2591.63235	4.0	0.368889	0.421674	0.001321	0.00035	0.00035	2	0.00046	0	0.616254	64	
AL5_11	AL5_11	46	11751.949405	4.0	0.447544	0.481243	0.00032	0.000549	0.000549	2	0.001181	0	0.53303	488	
AL5_17	AL5_17	71	9351.512665	3.0	0.404466	0.509465	0.007784	0.019488	0.019488	2	0.001723	0	0.36646	385	
AL5_28	AL5_28	88	49613.89684	3.0	0.495527	0.500452	0.005768	0.012992	0.012992	2	0.00167	0	0.396578	366	
AL5_38	AL5_38	44	19688.527388	4.0	0.3638	0.430781	0.004149	0.004271	0.004271	2	0.001184	0	0.627607	567	
AL5_38	AL5_38	42	16526.17685	4.0	0.40766	0.444106	0.001186	0.00087	0.00087	2	0.001127	0	0.533679	444	
AL5_44	AL5_44	37	38126.027218	4.0	0.363947	0.368966	0.000881	0.002721	0.002721	2	0.001054	0	0.75873	478	
AL5_50	AL5_50	53	38474.287388	4.0	0.43688	0.498027	0.001184	0.006942	0.006942	2	0.001772	0	0.524687	696	
AL5_51	AL5_51	50	21786.426888	4.0	0.439557	0.498033	0.000111	0.007155	0.007155	2	0.001272	0	0.561224	660	
AL5_54	AL5_54	50	16144.136602	4.0	0.426343	0.464883	0.006	0.008315	0.008315	2	0.001283	0	0.545667	637	
BL_1	BL_1	107	397630.178939	3.0	0.515713	0.537388	0.002565	0.00663	0.00663	3	0.001866	0	0.510692	2842	
BL_5	BL_5	159	826260.82645	3.0	0.543446	0.597561	0.008115	0.044221	0.044221	3	0.002732	0	0.388777	4632	
CH_1	CH_1	74	263031.30548	3.0	0.480469	0.51887	0.001687	0.026485	0.026485	4	0.001407	0	0.519828	1364	
CH_5	CH_5	67	18832.35028	4.0	0.467877	0.506662	0.001952	0.022445	0.022445	4	0.00126	0	0.595711	1192	
CH_6	CH_6	94	220418.02677	3.0	0.393133	0.546441	0.003852	0.039844	0.039844	4	0.00172	0	0.452782	1937	
CH_17	CH_17	119	270916.376311	3.0	0.51108	0.560072	0.003649	0.025444	0.025444	4	0.002114	0	0.364032	2720	
DP_1	DP_1	15	2747.112323	4.0	0.444678	0.473803	0.002513	0.007556	0.007556	0	0.001038	0	0.44385	246	
DP_5	DP_5	47	42448.487679	4.0	0.418359	0.465434	0.004888	0.009507	0.009507	0	0.001281	0	0.325604	337	
DP_28	DP_28	32	11131.78854	4.0	0.40218	0.433943	0.000756	0.003902	0.003902	0	0.001063	0	0.453726	231	
DP_38	DP_38	32	12028.914873	4.0	0.432845	0.463415	0.002348	0.006371	0.006371	0	0.001005	0	0.403326	320	
 Add column  Merge columns  Delete column  Clear column  Copy data to other column  Fill column with a value  Duplicate column  Create a boolean column from regex match  Create column with list of regex matching groups  Negate boolean values  Convert column to dynamic															

2

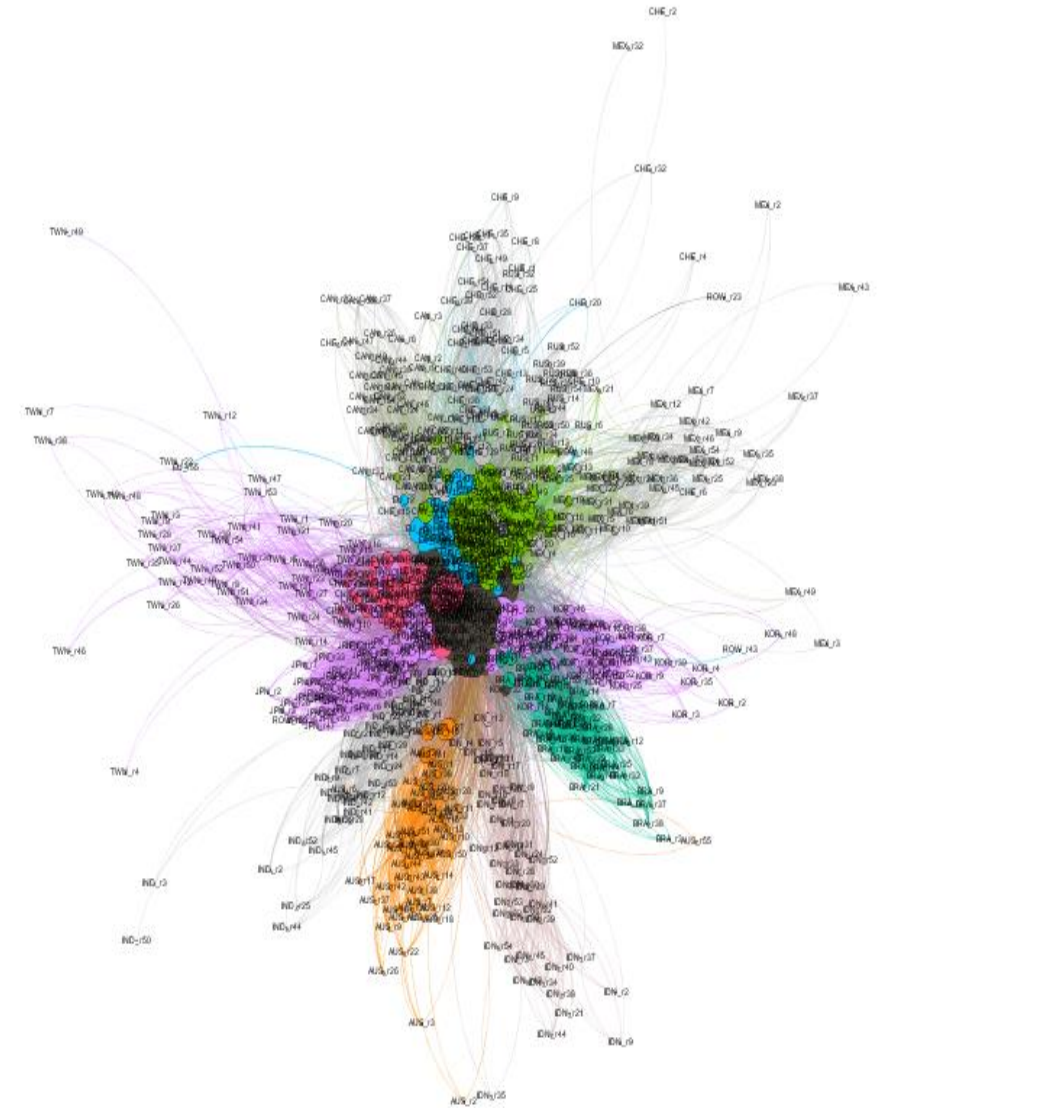


3

Network Diagram :2009

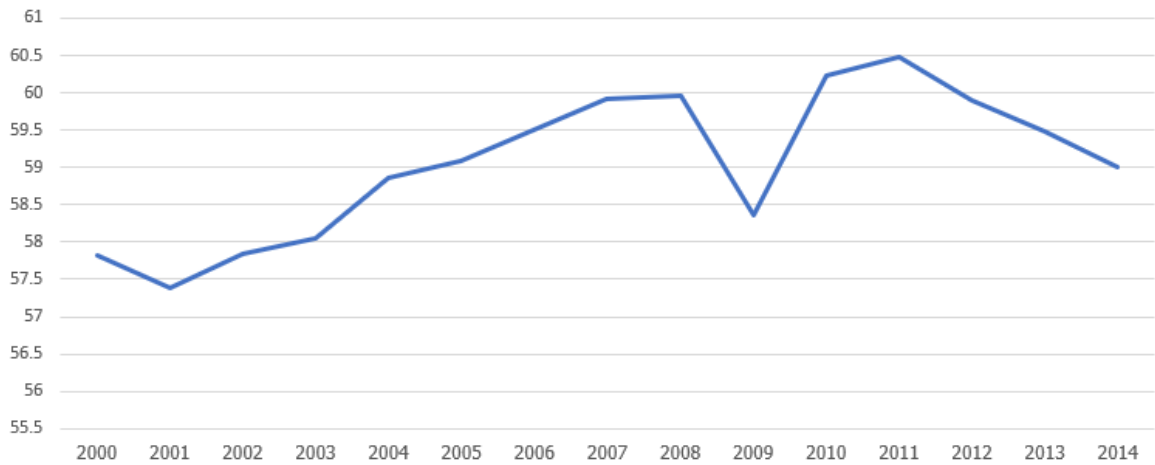


Network Diagram :2014

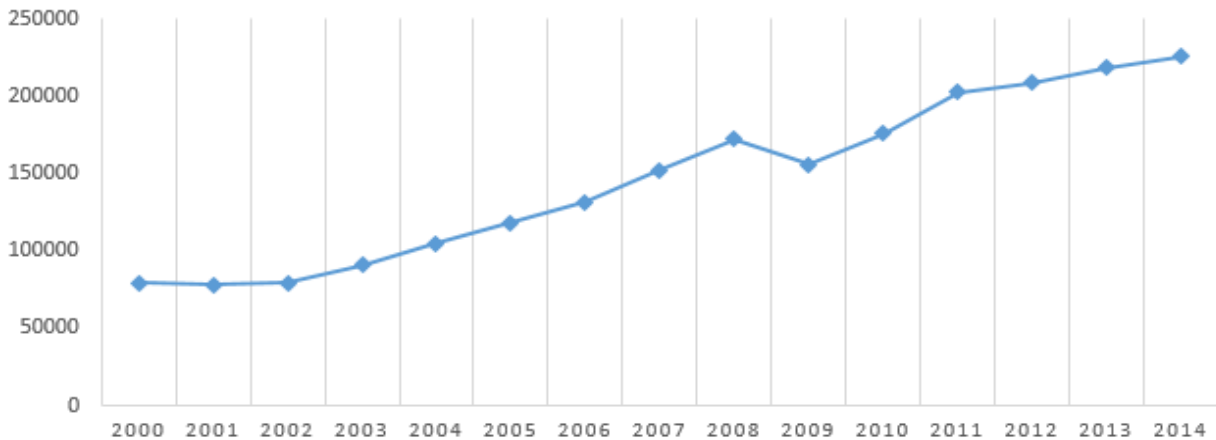


TASK #1 Comparison of main network indicators

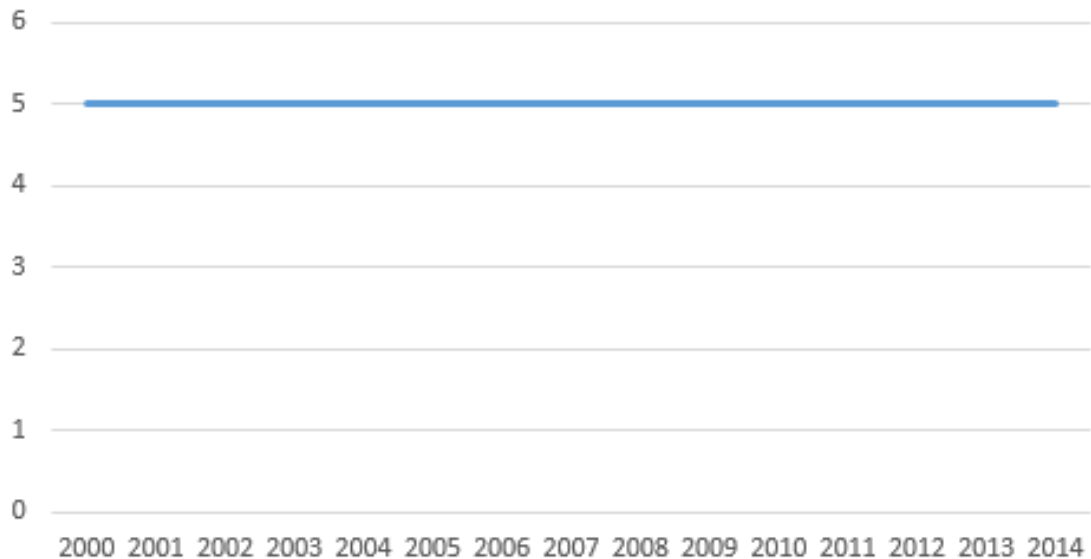
Average Degree



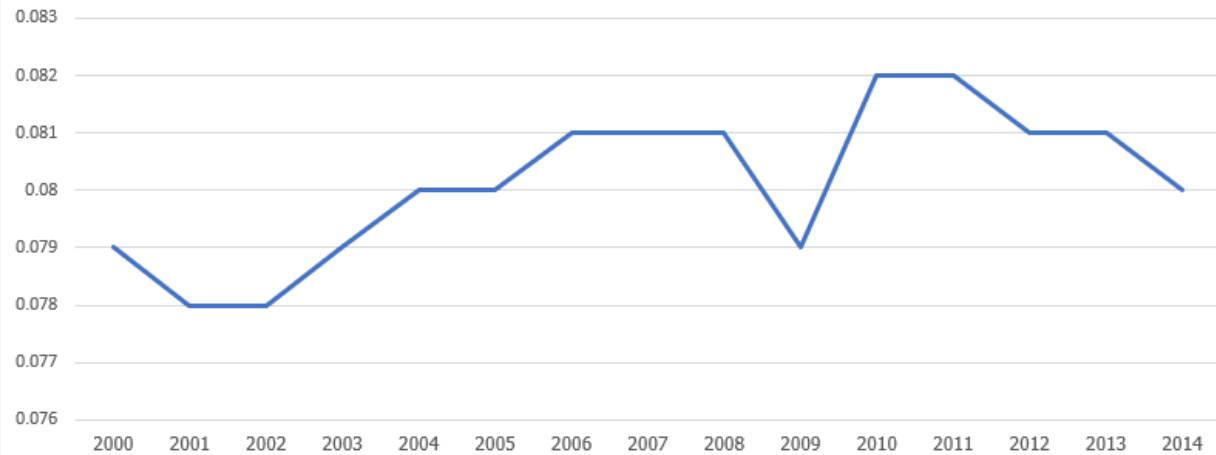
AVERAGE WEIGHTED DEGREE



Network Diagram

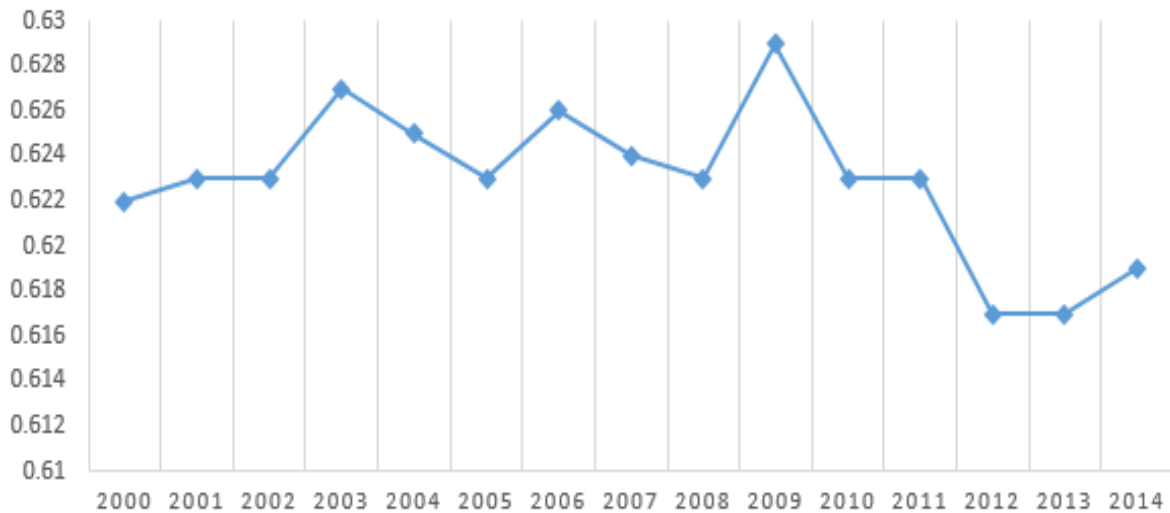


Graph Density

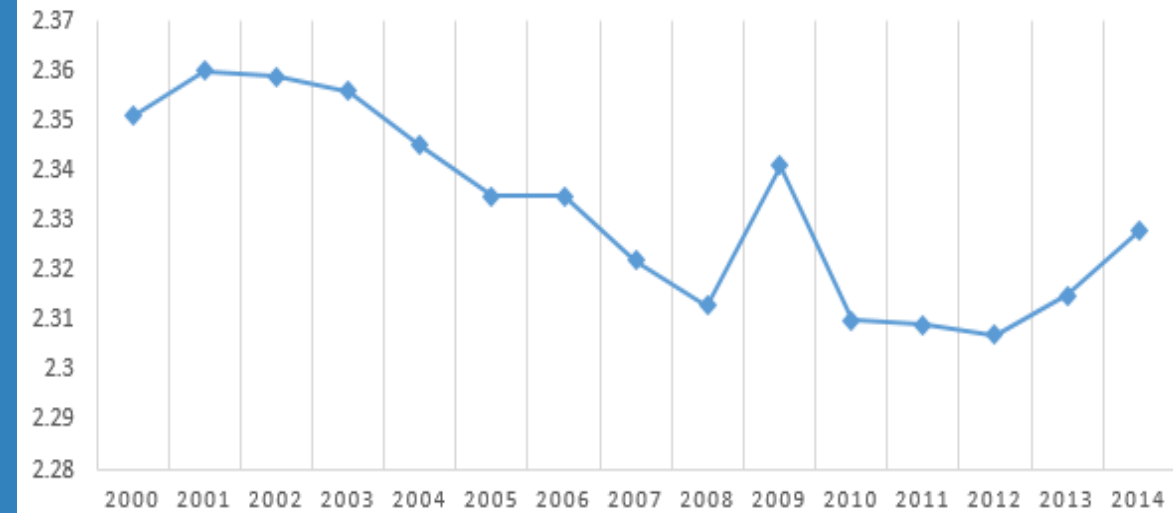


TASK #1 Comparison of main network indicators [cont]

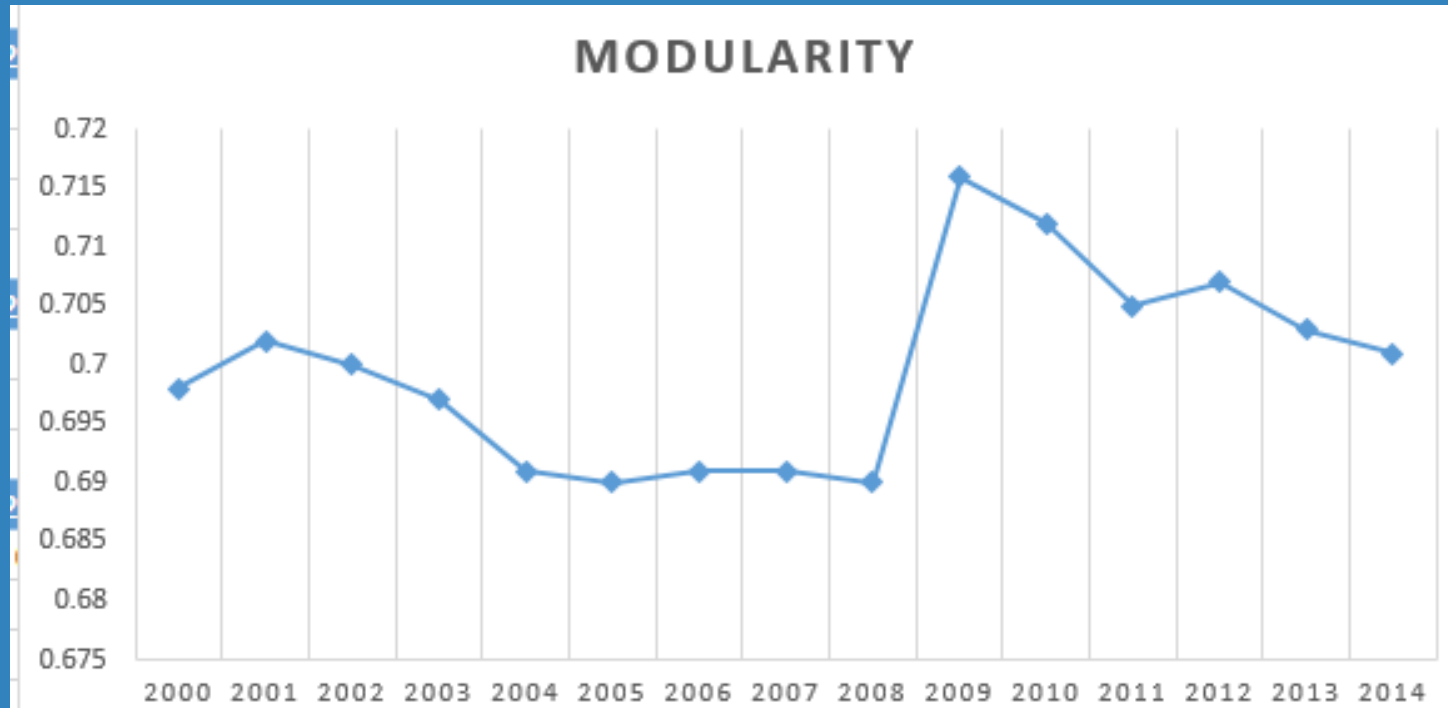
AVG. CLUSTERING COEFFICIENT



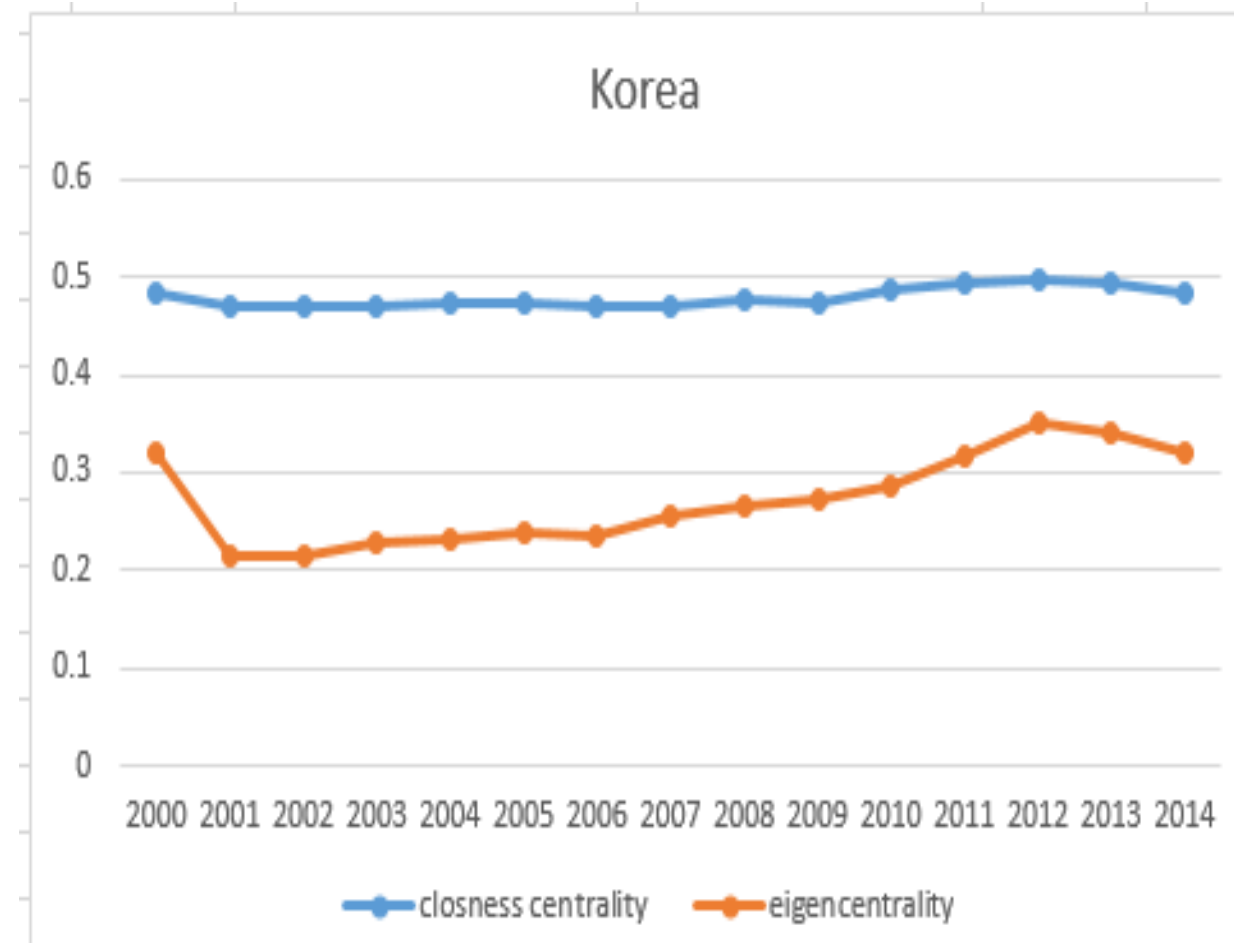
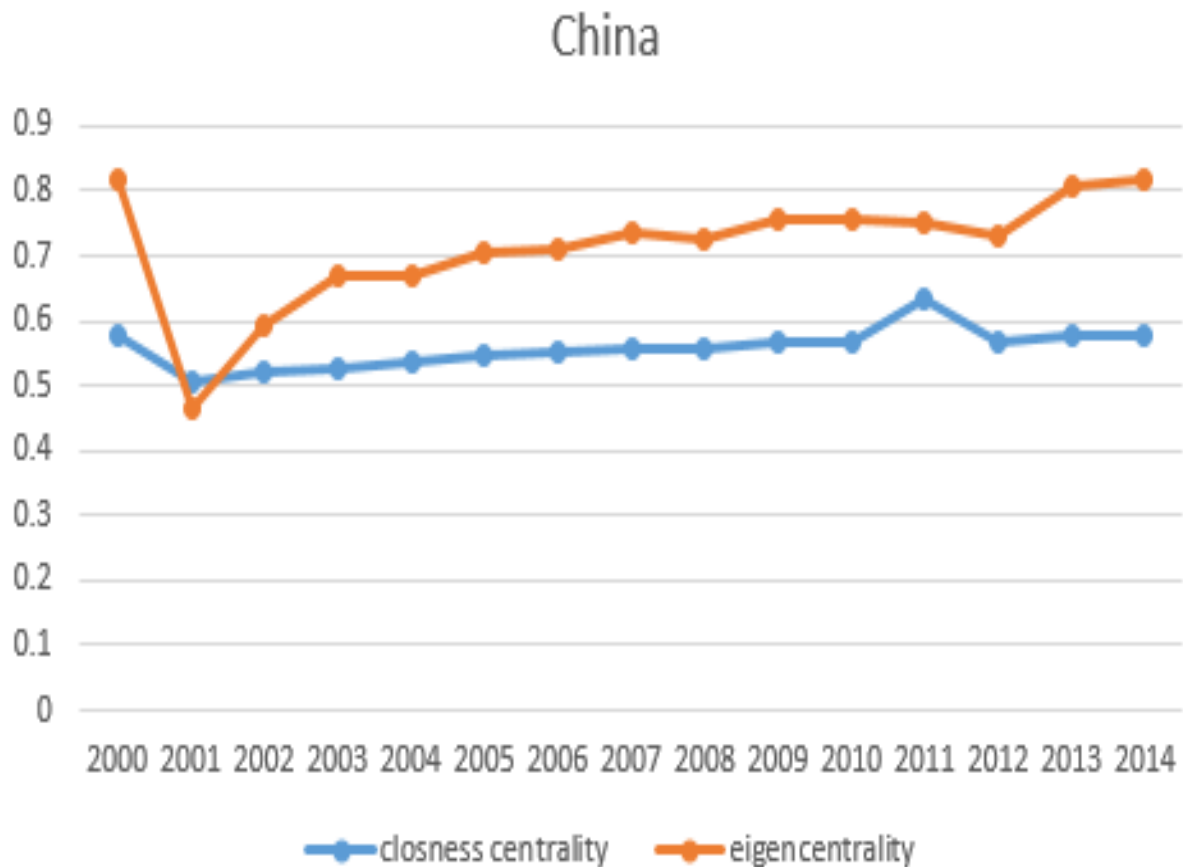
AVG. PATH LENGTH



TASK #1 Comparison of main network indicators [cont]

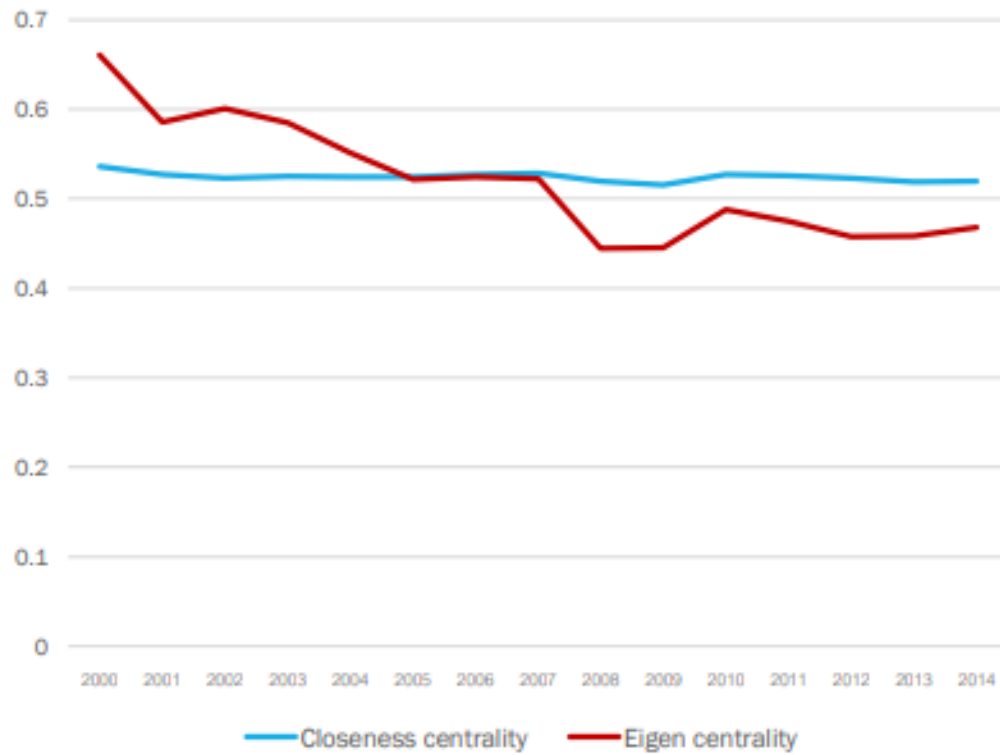


TASK #2: Electronic industry sector no.17

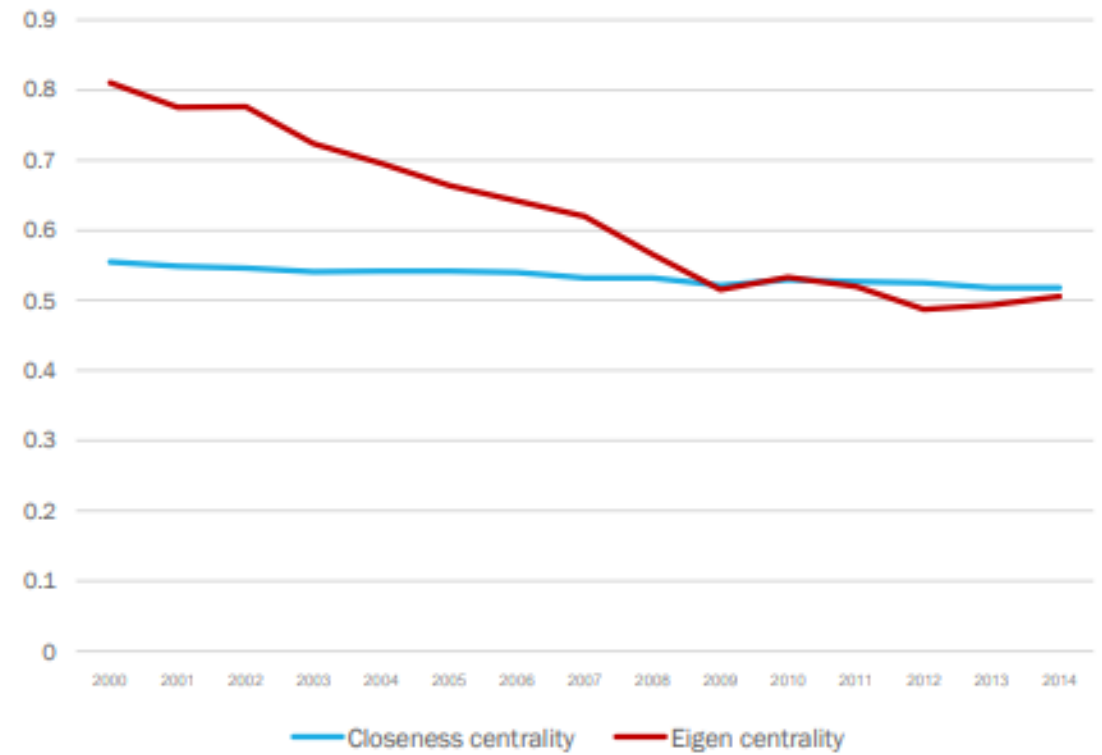


#Task2 [cont]

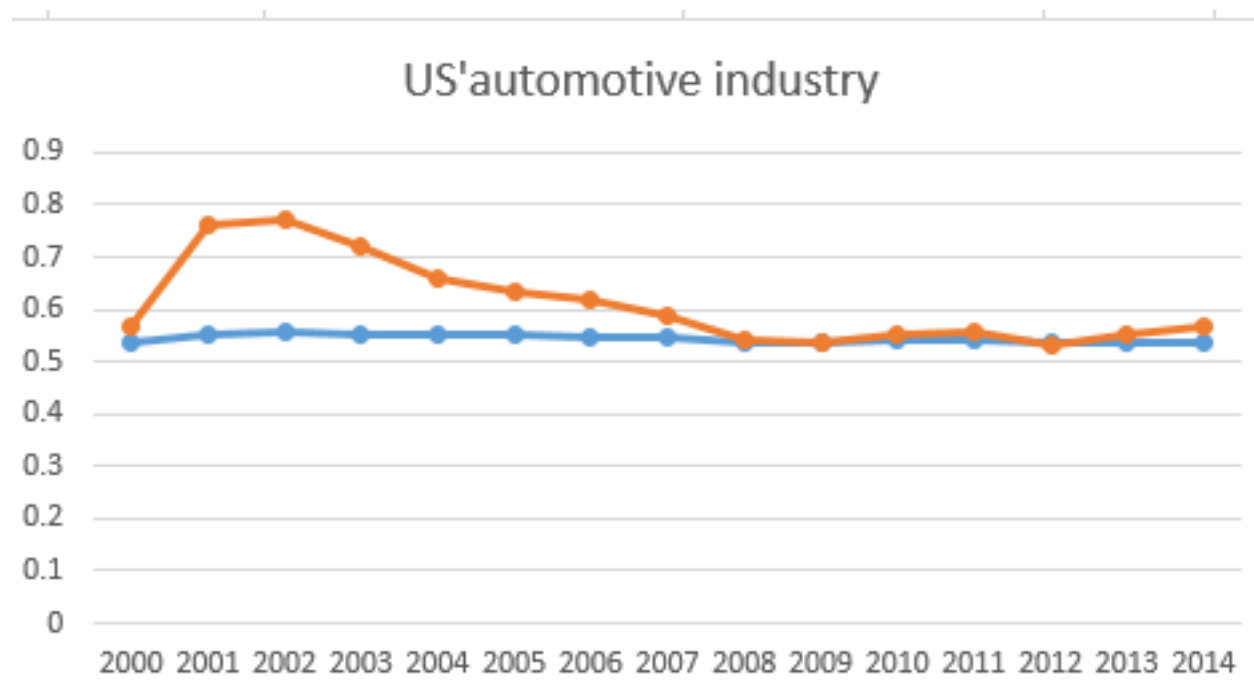
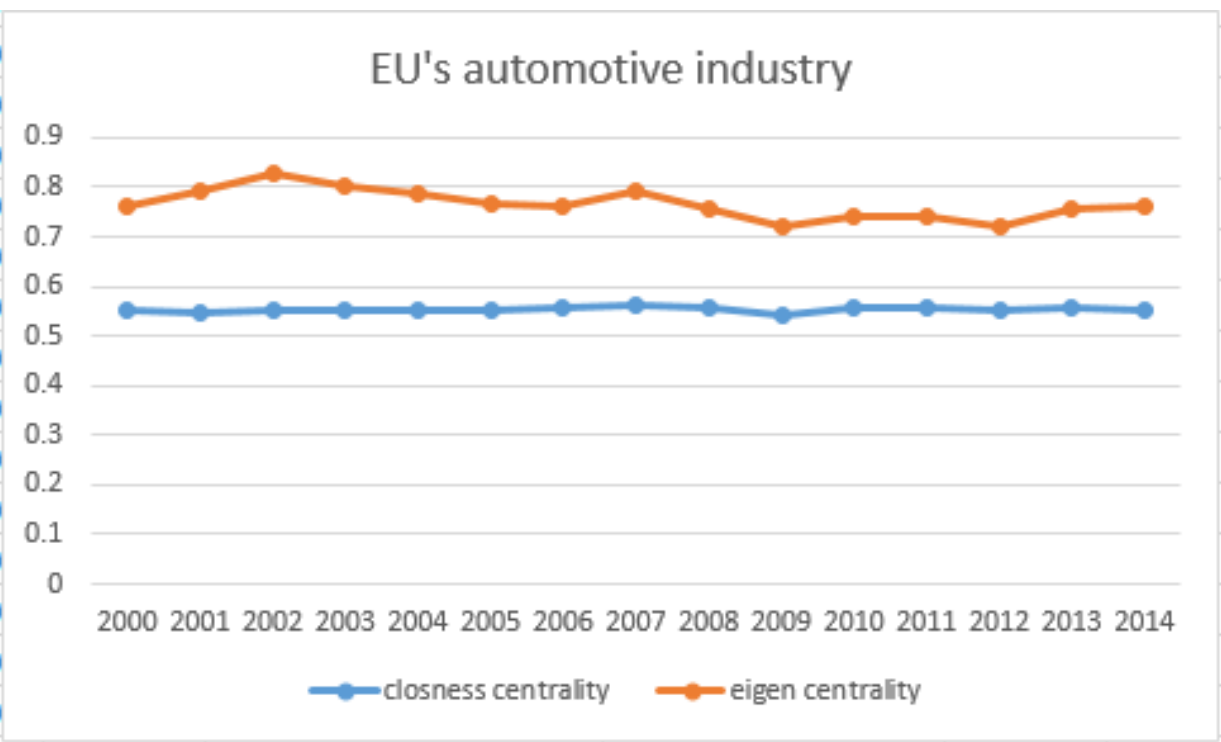
Taiwan



Japan

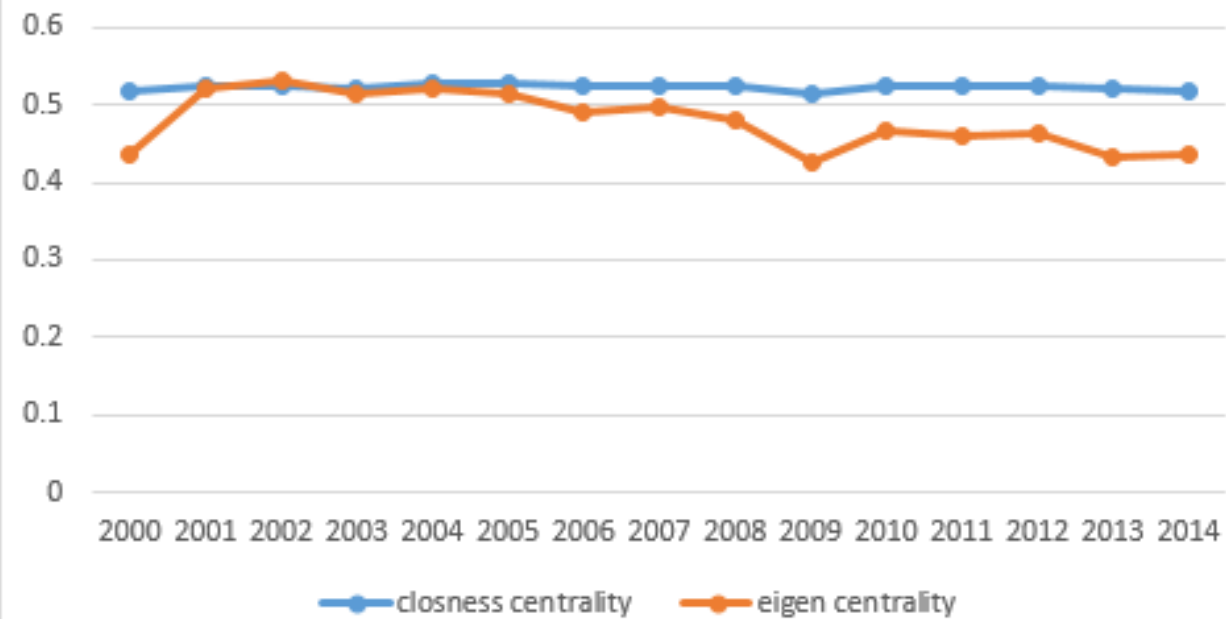


TASK #3: Comparison of centrality indices of automotive industry (sector no.20)

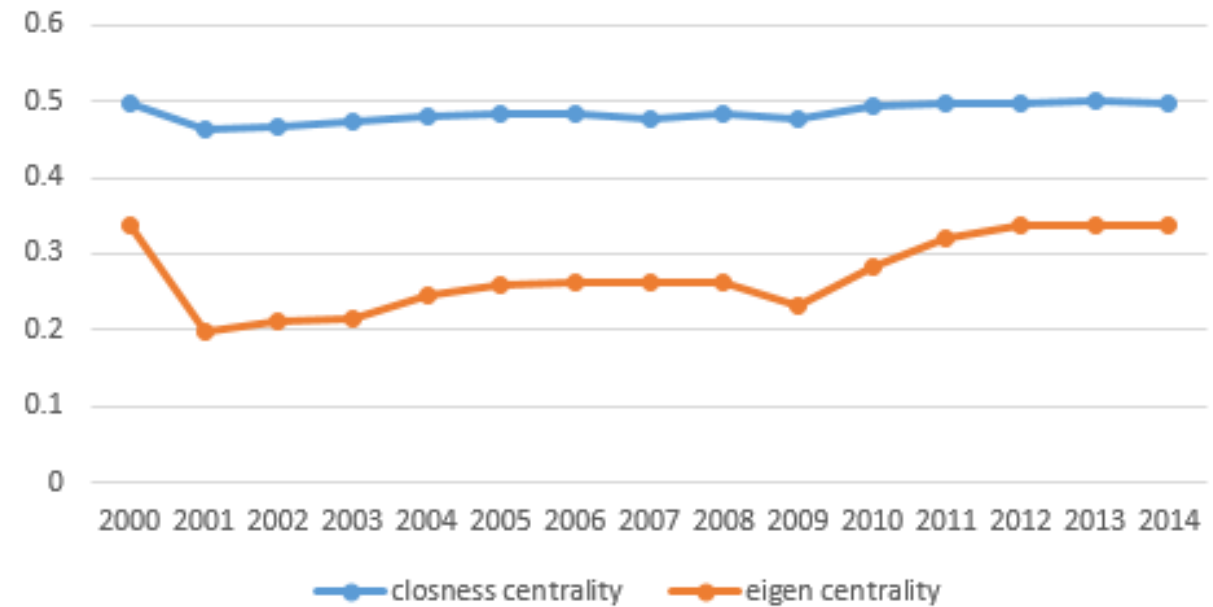


TASK #3 1(CONT)

Japan's automotive industry



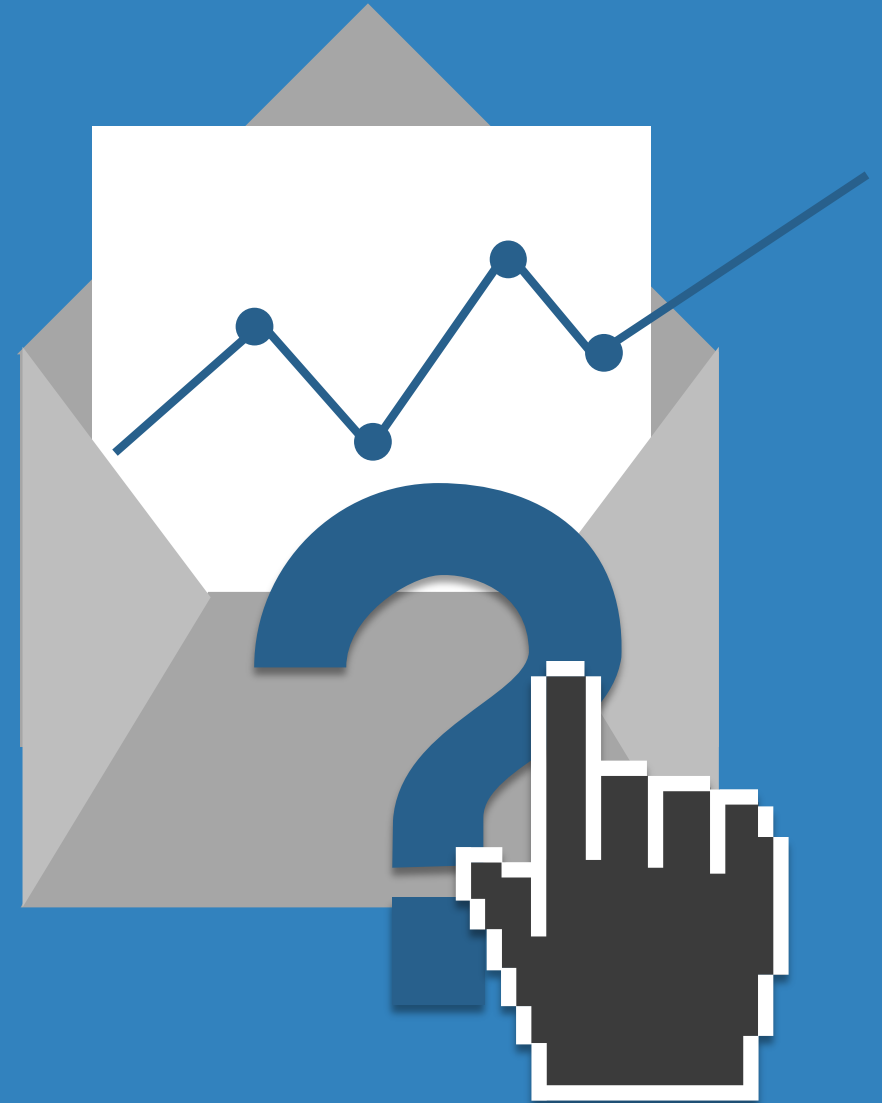
Korea's automotive industry



Policy Recommendations

Industrial policy Recommendations

- 1 STEPPING UP THE INDUSTRIALIZATION LADDER
- 2 Governing industrial policy The technical and political dimensions
- 3 Building productive



Thank You

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