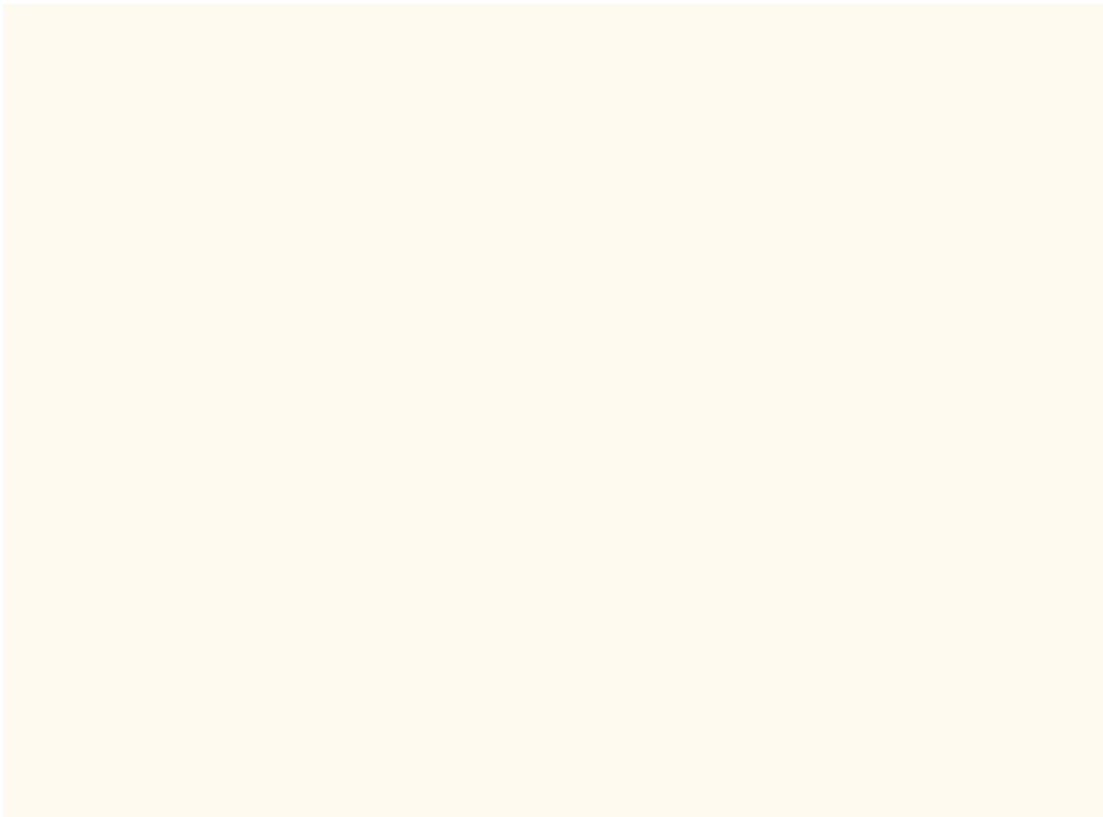




**Identifying the key industrial sectors and international competitiveness for
“INDONESIA”**



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Introduction

In this study, we will look into the background of Indonesia, the country historical trend in import, export and trade balance from 2001 to 2018, quadrant analysis from Trademap, global and local backward and forward multipliers by comparing between year 2005 and year 2015, sector share on GDP also compare between year 2005 and 2015, network analysis of Indonesia sectors, the country's OECD's TiVA indicators, economic complexity index and analyze combination of indicators.

In order to find out which industry and sector that the government should select and put their money to invest in it the most and what policies that the government should do to create the most positive impact to Indonesia's economic growth in the future.

Background

Indonesia or Republic of Indonesia is one of the countries in Southeast Asia, geographically, the country consists of many islands, more than seventeen thousand islands, which made Indonesia to become the biggest island country in the world. Indonesia is the most populous country in Southeast Asia and the 4th most populous country in the world, with more than 267 million people, from worldpopulationreview.com, the median age of the population is approximately 30.2 years old and around 42.4% of the entire population is between 25 to 54 years old. Currently, Indonesia is considering to be one of the middle income countries with the GDP per capita around \$4,068.02.

According to Tambunan (2010), during the Asian Financial crisis in 1997 to 1998, the Indonesian economy fell into a deep recession in 1998 with overall GDP growth at minus 13.7 percent. The worst sector that faced decline were the construction sector at -39.8 percent, financial sector at -26.7 percent, trade, and hotel and restaurant at -18.9 percent. Other sectors also faced with decline, large contractions, manufacturing sector (-12.9 percent) and transport and communication (-12.8 percent).

Interestingly, the agricultural and utility sectors still experienced positive growth at about 0.2 percent and 3.7 percent in 2008 and 2009. This crisis also stopped export-oriented firms from gaining better world price competitiveness, caused a significant drop in income per capita and increased the country's poverty rate.

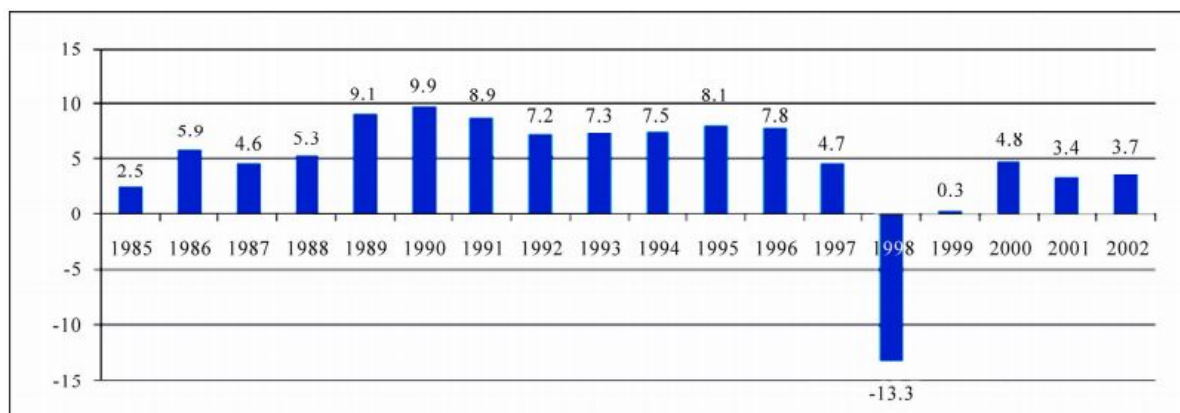


Figure 1 : Indonesian GDP Growth rate during the 1997/1998 Crisis.

Souce : Statistical Yearbook of Indonesia (various years), Indonesian National Agency of Statistics (BPS) (www.bps.go.id), https://www.scirp.org/pdf/me20100300005_81183836.pdf

Again in the global economy in 2008 and 2009, unlike other countries, Indonesia and the Philippines managed to keep positive growth, although they still faced declining rates of GDP growth during the crisis period. Tambunan (2010) showed that from official data (National Agency of Statistics/BPS), overall, the growth rate of Indonesian economy was at around 4.5 percent, much lower than the growth rate achieved in 2008, which they quickly recovered afterward in 2010.

Table 1 : Economic growth in the developing world by region, 2007-2010.

	2007	2008	2009	2010*
East Asia and Pacific	11.4	8.0	6.8	8.1
-PRC	13.0	9.0	8.4	9.0
-Indonesia	6.3	6.2	4.5	5.6
-Thailand	4.9	2.2	-2.7	3.5
Europe and Central Asia	7.1	4.2	-6.2	2.7
South Asia	8.5	5.7	5.7	6.9
-India	9.1	6.1	6.0	7.5
-Pakistan	5.7	2.0	3.7	3.0
-Bangladesh	6.4	6.2	5.9	5.5
Latin America and Caribbean	5.5	3.9	-2.6	3.1
Middle East and North Africa	5.9	4.3	2.9	3.7
Sub-Saharan Africa	6.5	5.1	1.1	3.8

Note: * forecast by the World Bank. Source: World Bank [5]

Source: https://www.scirp.org/pdf/me20100300005_81183836.pdf

Table 2 : Indonesia GDP Growth Rate - Historical Data.

Indonesia GDP Growth Rate - Historical Data		
Year	GDP Growth (%)	Annual Change
2005	5.69%	0.66%
2006	5.50%	-0.19%
2007	6.35%	0.84%
2008	6.01%	-0.33%
2009	4.63%	-1.38%
2010	6.22%	1.60%
2011	6.17%	-0.05%
2012	6.03%	-0.14%
2013	5.56%	-0.47%
2014	5.01%	-0.55%

2015	4.88%	-0.13%
2016	5.03%	0.16%
2017	5.07%	0.03%
2018	5.17%	0.10%

Source : www.macrotrends.net/countries/IDN/indonesia/gdp-growth-rate

Historical Trend

For historical trend, we used the time-series information of Indonesia's export in the figure 2, import and trade balance information from trademap.org, between 2001 to 2018, to analyze the trend in trade of the country. First, we want to mention the historical export trend of Indonesia, from the graph, we can see that since 2001, Indonesia export trend had been increasing up until 2009, which their export clearly decreased, caused from the global financial crisis in that year, before starting to skyrocketed around 2006, Indonesia had very low varieties of the export products, their main export of the nation was mainly natural products including Mineral fuels, mineral oils and products of their distillation, this trend is still continuing throughout the decades, At 2006, we can also see that Animal products that also started to grow and became the second most export category, surpassed the electronic machinery and other equipment which stayed very stable with very low growth over the years. Between 2011 to 2016, the natural energy products faced significant decrease in export rate, but then steadily rose up again from 2017 and onward, continuing to dominate the Indonesia export over other sectors.

For Indonesia's import trend, according to the figure 3, similarly to the export trend, their top import is also natural products including Mineral fuels, mineral oils and products of their distillation, followed by the large machinery, mechanical appliances, reactors and machinery parts etc, then followed by the electronic machinery and other equipment in the third ranking. From 2001 to 2008, for all sectors of their import continuously increased before dropped at 2009 at similar fashion to their exports, and skyrocketed afterward before peaked at 2012-2013 then it all slowly decreasing from 2013 to 2016, with the exception of the

natural energy products and minerals that sharply declined in value from about 45,544,694 thousand US dollar in 2013 to just 19,250,356 thousand US dollar in 2016, which was even lower than machinery, mechanical appliances, reactors and machinery parts sector which had the value of 21,070,907 thousand US dollar in that year. However, in 2017, the mineral fuel energy sector jumped back with its sudden increase back to the first import ranking again.

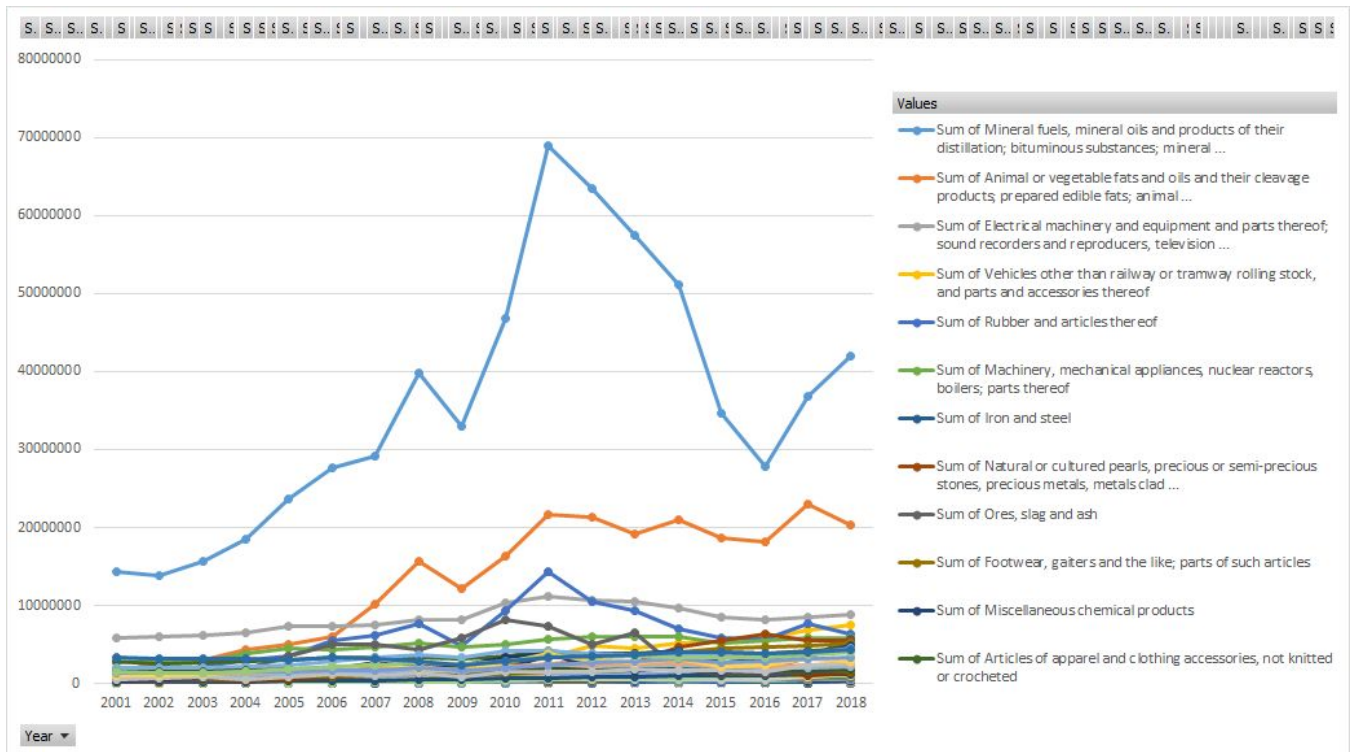


Figure 2 : Indonesia’s historical export trend from 2001 to 2018

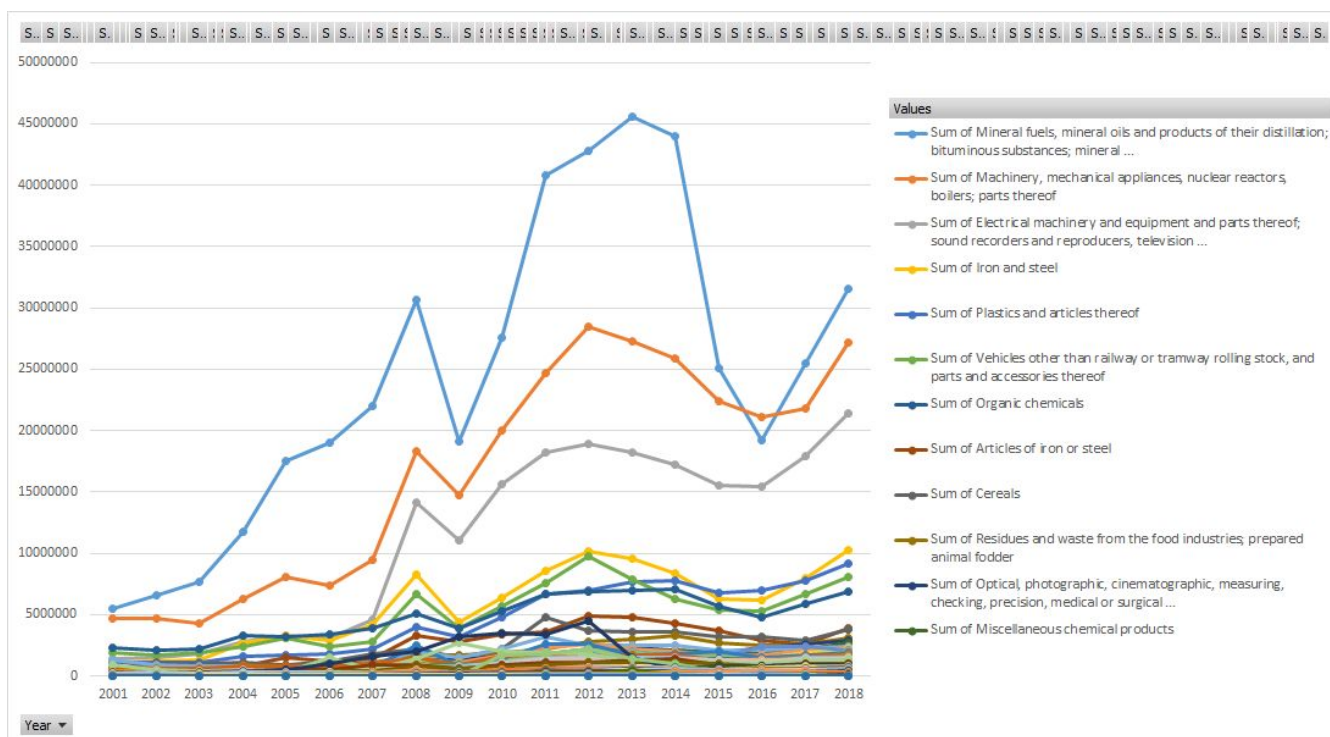


Figure 3 : Indonesia's historical import trend from 2001 to 2018

For the trade balance in figure 4, at the beginning, Indonesia's most profitable categories in 2001 are led by the mineral fuel products category, followed by Electrical machinery and equipment and parts as second place and the third place is the Wood and articles of wood; wood charcoals category. Interestingly, their 5 most negative in trade balance categories at this period are, from the fifth from the bottom to first, are Iron and steel, Ship, boats and floating structures, Cheminacl, Non-railway vehicle and Machinery, mechanical appliances, nuclear reactors and parts. The trend stayed at similar level up to 2006, then in 2007, the mineral fuel dropped in trade balance and got replaced by Animal or vegetable fats and oils and their cleavage products, which continued to be the first rank until peaked in 2008 and got overtaken again by Mineral fuel products that largely increase from 2007 to 2011, reached the highest possible positive trade balance value of the country at 28,080,906 thousand US dollar and sharply declined afterward. After 2011, the Animal or vegetable fat products became and stayed the first rank of positive trade balance of Indonesia upto 2018.

Another interesting point is the Electrical machinery and equipment and parts that from the second rank in trade balance from 2001 to 2003, it slowly declined, until in 2007, it's

balance became negative and continuously decreasing after the slight increase in 2009. In 2018 it became the 2nd to last in the trade balance, only surpassed by Machinery, mechanical appliances, nuclear reactors, boilers, that has only been decreasing since the beginning, at the most negative trade balance position.

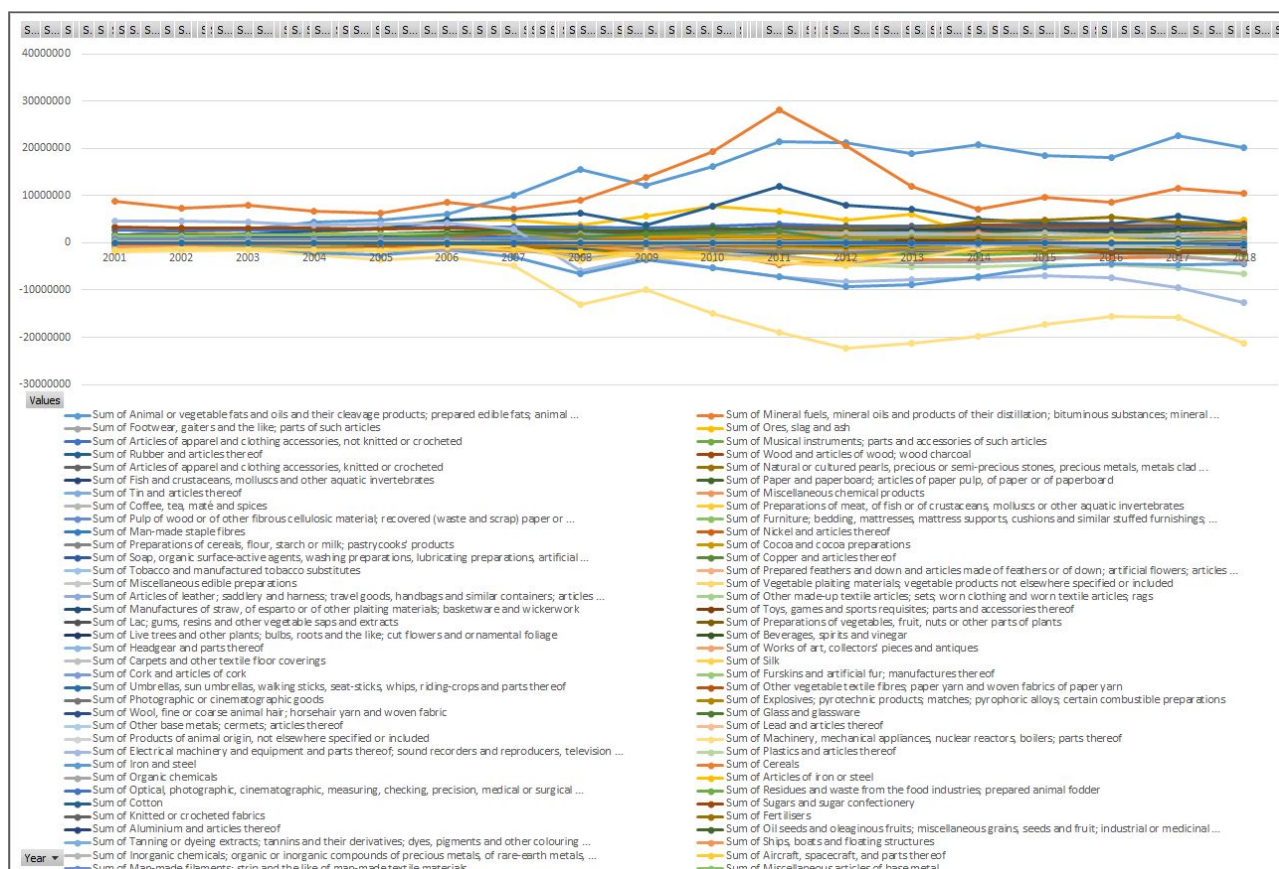


Figure 4 : Indonesia's historical trade balance from 2001 to 2018

Quadrant Analysis

For quadrant analysis that we have collected from Trademap, as shown on the graph, on the horizontal axis, we have the annual increase of Indonesia share in world import and on the vertical axis, it shows the annual growth of world exports, both are from between 2014 to 2018 and using percentage as unit. First noticeable point we can see is that while the mineral fuels, mineral oils and products of their distillation sector is a very large sector that Indonesia is a net exporter, it fell under both the horizontal line of average annual nominal growth of

total exports of the world and the vertical line of 0% growth of Indonesia's world market share, designated it in the losers in declining sectors quadrant, which shows us that it will be difficult to trade promote for product groups in this category since we facing challenges in both supply and demand side.

Another large category, machinery, mechanical appliances and parts, which Indonesia is a net importer, has fallen into the upper-left quadrant sector, the loser in growing market. Which is quadrant for categories that Indonesia has lost market share while the world market has grown, we can improve this sector by investigating how to increase the international market demand of the products.

On the winners in growing sectors quadrant is also containing some large product categories that Indonesia is a net importer, such as the electrical machinery, equipment and parts, which is the biggest one in this quadrant and the vehicles other than railway or tramway rolling stock, these sectors are products that grew faster than overall world trade and Indonesia has been able to outperform world market growth. Exporters of these products have proven their international competitiveness over the periods, for these product categories, we could promote it further by broadening supply capacity.

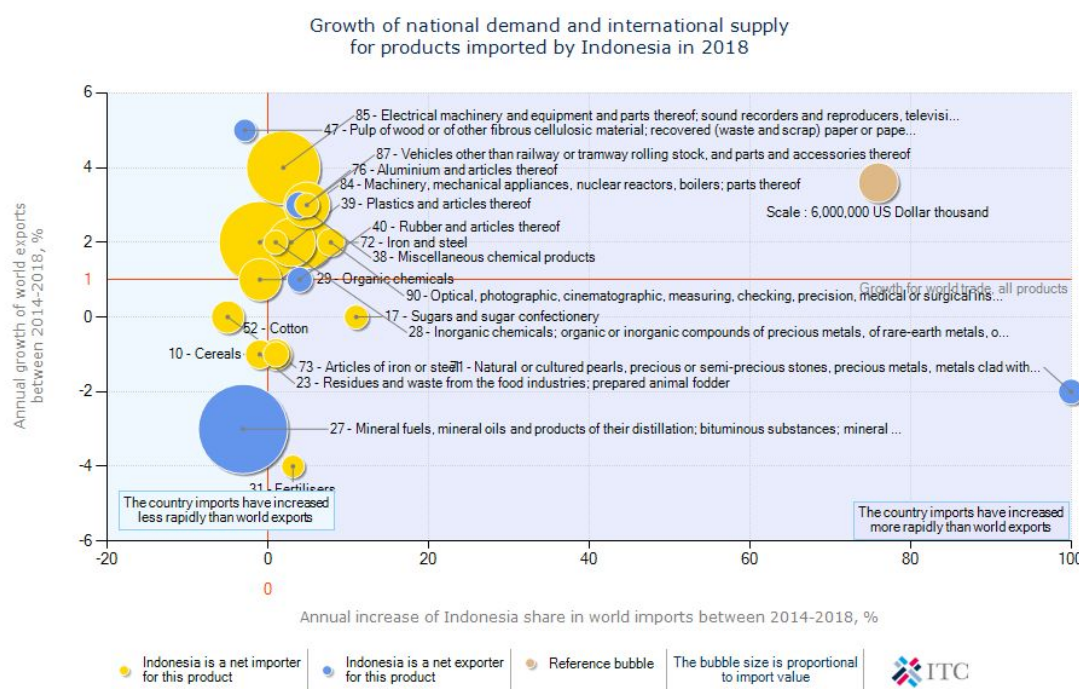


Figure 5 : Growth of national demand and international supply for the products imported by Indonesia in 2018

Source : www.trademap.org, ITC calculations based on UN COMTRADE and ITC statistics

Global Backward and Forward Multipliers (Comparing 2005 and 2015)



Figure 6 : Global multiplier 2005 vs 2015 Indonesia

After the global backward and forward multipliers of Indonesia between 2005 and 2015 chart is done, we create distance of the differences table and ranking the value to see what industries have the five biggest changes because the major units and the gaps between gridlines in both vertical axis and horizontal axis are not similar by using a formula: $c = \sqrt{a^2 + b^2}$, (a = difference in backward multiplier between 2005 and 2015 on X-axis, b = difference in forward multiplier between 2005 and 2015 on Y-axis, and c = distance of the differences from 2005 to 2015).

Table 3: Top 5 biggest changes in global backward and forward multiplier of Indonesia between 2005 and 2015

Industry	Difference in global backward multiplier between 2005 and 2015 on X-axis (a)	Difference in global forward multiplier between 2005 and 2015 on Y-axis (b)	Distance of the differences from 2005 to 2015 (c)
D19 : Coke and refined petroleum products	0.1	-1.0	1.00499
D49T53 : Transportation and storage	-0.1	0.8	0.80623
D05T06 : Mining and extraction of energy producing products	0.1	-0.8	0.80623
D13T15 : Textiles, wearing apparel, leather and related products	0.2	0.7	0.72801
D26 : Computer, electronic and optical products	0	0.7	0.7

From the table 3, the longest distance is 1.00499 that belongs to D19 : coke and refined petroleum products industry which backward multiplier is 2.1 and 2.2 in 2005 and 2015 respectively. The difference in backward multiplier from 2005 to 2015 is 0.1. On the other hand, forward multiplier is 5.8 and 4.8 in 2005 and 2015 respectively. The difference in

backward multiplier from 2005 to 2015 is -1.0. It means that Coke and refined petroleum products industry expands in upstream industry and shrinks in downstream industry supply chain.

Local Backward and Forward Multipliers (Comparing 2005 and 2015)



Figure 7: Local multiplier 2005 vs 2015 Indonesia

After the local backward and forward multipliers of Indonesia between 2005 and 2015 chart is done, we create distance of the differences table and ranking the value to see what industries have the five biggest changes because the major units and the gaps between gridlines in both vertical axis and horizontal axis are not similar by using a formula : $c = \sqrt{a^2 + b^2}$ (a = difference in backward multiplier between 2005 and 2015 on X-axis, b = difference in forward multiplier between 2005 and 2015 on Y-axis, and c = distance of the differences from 2005 to 2015).

Table 4 : Top 5 biggest changes in local backward and forward multiplier of Indonesia between 2005 and 2015

Industry	Difference in local backward multiplier between 2005 and 2015 on X-axis (a)	Difference in local forward multiplier between 2005 and 2015 on Y-axis (b)	Distance of the differences from 2005 to 2015 (c)
D49T53 : Transportation and storage	0.1	0.7	0.7071
D13T15 : Textiles, wearing apparel, leather and related products	0.2	0.5	0.5385
D28 : Machinery and equipment, nec	0.5	-0.1	0.5099
D25 : Fabricated metal products	0.4	0.3	0.5
D24 : Basic metals	0.2	0.4	0.4472

From the table 4, the longest distance is 0.7071 that belongs to D49T53 : transportation and storage industry which backward multiplier is 1.7 and 1.8 in 2005 and 2015 respectively. The difference in backward multiplier from 2005 to 2015 is 0.1. On the other hand, forward multiplier is 2.2 and 2.9 in 2005 and 2015 respectively. The difference in backward multiplier from 2005 to 2015 is 0.7. It means that transportation and storage industry expands in both upstream and downstream industry. But from the table 4, it shows that this industry has contribution to value of production to be downstream than upstream from investment.

Sector Share on GDP (Comparing 2005 and 2015)

From figure 8, It shows that in the year 2005, the section that had the most share in GDP of Indonesia was wholesale, retail trade and repair of motor vehicles, with over 11.0 percent share. The follow-up in number two is the food products, beverage and tobacco at 9.0 percent and number three is the agriculture, forestry and fishing at 8.8 percent. Another interesting sector is the construction sector that was just around 7.2 percent during 2005.

In 2015, we can see the different and shifts of the sector share of Indonesia industry by GDP percentage, while some sectors' GDP share increased, some got declined over the decade, now the sector with the most sector share is construction that sharply increased from 7.2 to 10.6 percent. The previous most share sector, wholesale, retail trade and repair of motor vehicles, dropped to 9.6 percent, equal to food products, beverages and tobacco sector, which made both sectors tied at third place. The second place is now the agriculture, forestry and fishing sector that rose to 10.2 percent.

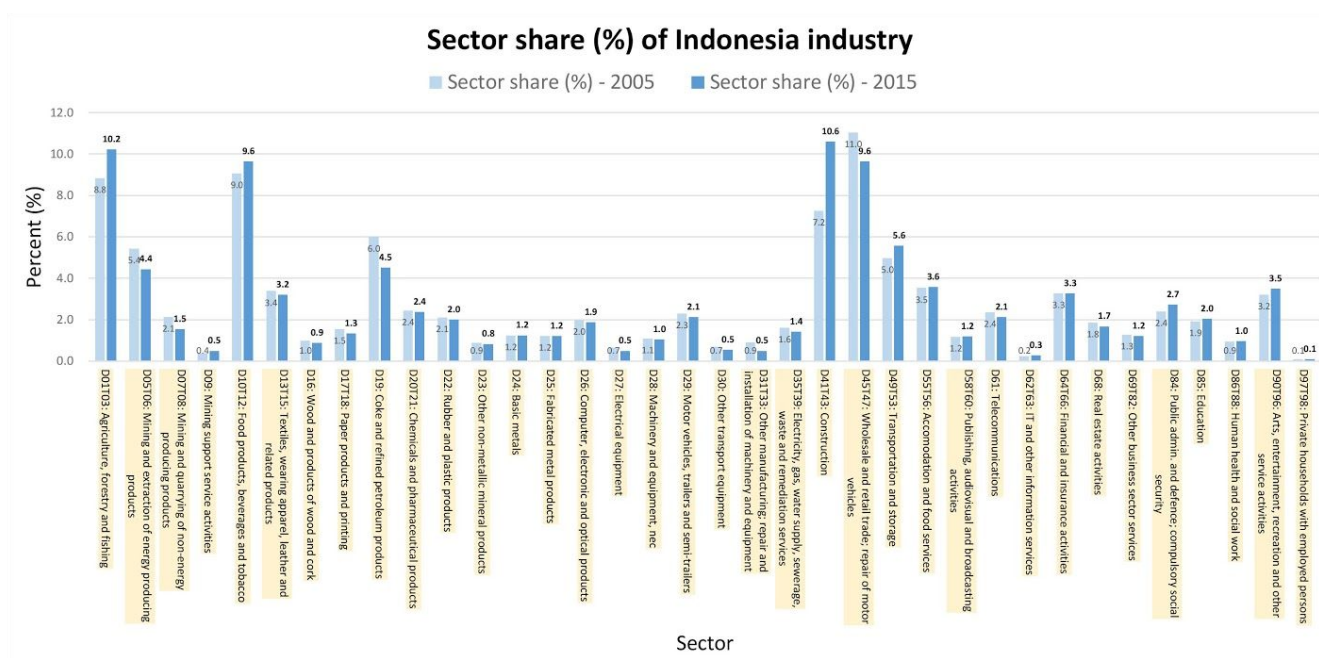


Figure 8 : Sector share (%) of Indonesia industry, comparing between 2005 to 2015

Network Analysis

From the Input-Output table, we calculate and visualize the centrality of Indonesia's sectors and industries, from figure 9 and table 5, we can see that the economic network of Indonesia's industries in the year 2015 is not equally distributed, as some nodes are clearly got more linkage connections than others, first, we can see the industry node with the highest centrality and the most number of linkage is the Wholesale and retail trade, repair of motor vehicles, with up to 30 linkages.

The interesting following-ups were Coke and refined petroleum products at 26 linkages, Transportation and storage at 22, Mining and extraction of energy producing products at 13, at the fourth place, we had Chemical and pharmaceutical products, Machinery and equipment, Other transport equipment, Mining and quarrying of non-energy producing products all 4 industries tied up at 11 linkages. While Agriculture, forestry and fishing industry only had a total of 10 linkages.

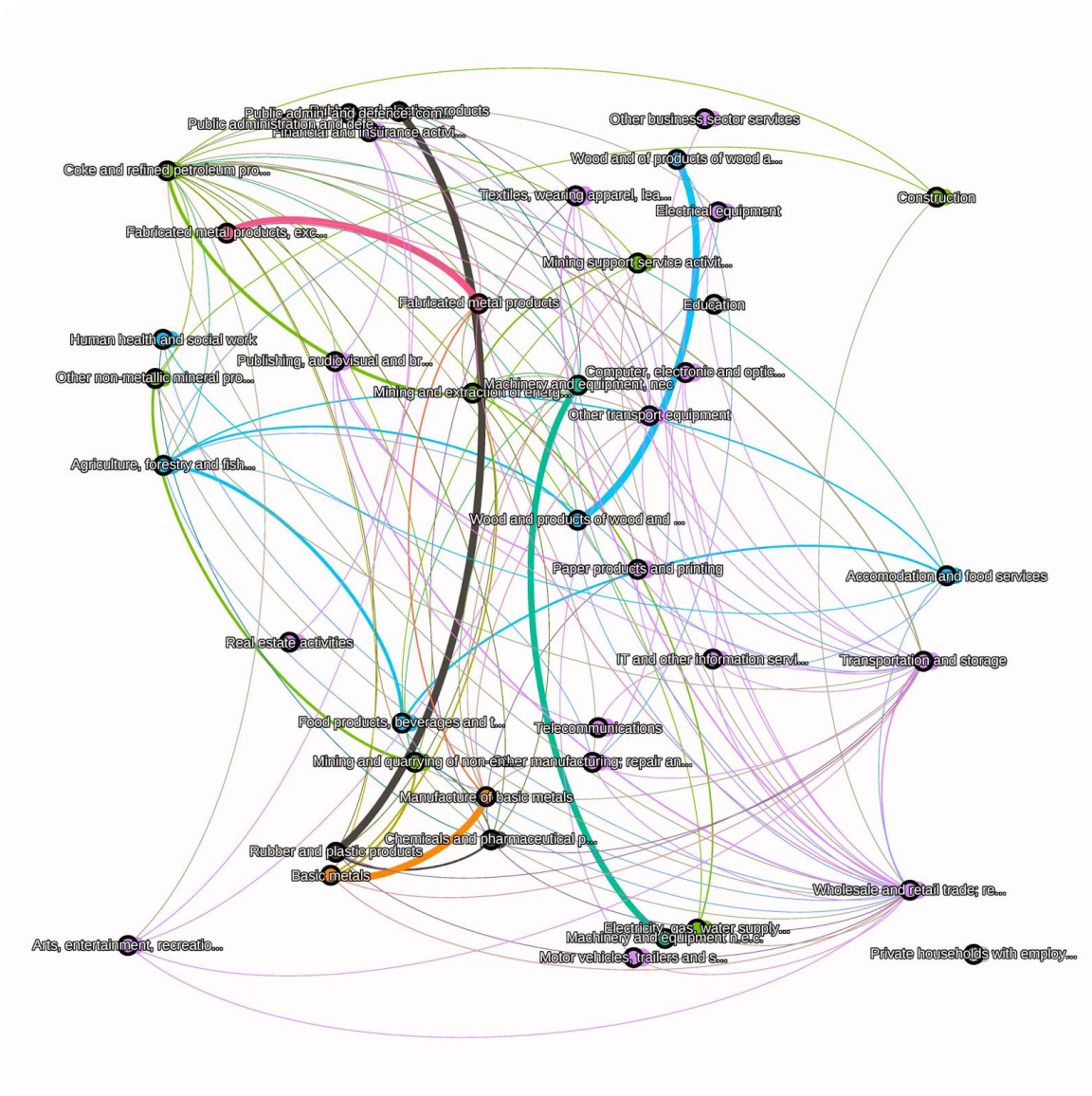


Figure 9 : Visualized Indonesia's network view based from Input-Output table in year 2015

Table 5: Indonesia's number of network linkages by industry

Industry	Numbers of linkage
Wholesale and retail trade, repair of motor vehicles	30
Coke and refined petroleum products	26
Transportation and storage	22
Mining and extraction of energy producing products	13
Chemical and pharmaceutical products	11
Machinery and equipment	11
Other transport equipment	11
Mining and quarrying of non-energy producing products	11
Agriculture, forestry and fishing	10

OECD's TiVA Indicators

Trade in Value Added (TiVA) shows the value added when producing goods and services for export and import. The data of Indonesia from OECD website between 2005 and 2015 can be calculated for domestic products by using domestic value added content of gross exports value (EXGR_DVA) divided by total gross exports (EXGR) and convert to percentage by multiplying 100. The outcome will be shown as a blue line on the chart that vertical axis is percentage and horizontal axis is years. The value began at 81.64% in 2005 and raised up to 87.07% in 2015. On the other hand, The data of Indonesia from OECD website between 2005 and 2015 can be calculated for foreign products by using foreign value

added content of gross exports value (EXGR_FVA) divided by total gross exports (EXGR) and convert to percentage by multiplying 100. The outcome will be shown as an orange line on the chart that vertical axis is percentage and horizontal axis is years. The value began at 18.36% in 2005 and declined to 12.93% in 2015. (Note : The percentage of trade in value added for domestic products (TiVA_DVA) plus the percentage of trade in value added for foreign products (TiVA_FVA) in the same year is equal to 100%. So, if the trend of TiVA_DVA rises up, the trend of TiVA_FVA will be declined.)

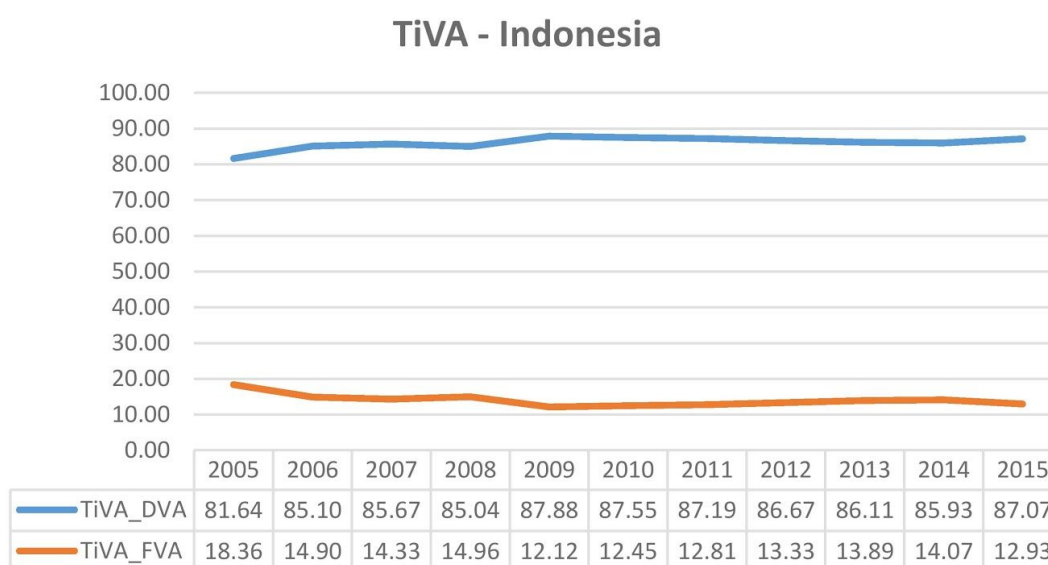


Figure 10 : Foreign value-added content of gross exports as a percent of total gross exports
2005 to 2015

Economic Complexity Index

Indonesia has an Economic Complexity Index (ECI) that measures the information intensity of an economy by considering the information intensity of the products it exports at -0.359668 value that it makes Indonesia on the 72nd ranking of complex country in 2016. Since 1964, Indonesia never has positive Economic Complexity Index until the current period of data. Trend of Indonesia's Economic Complexity Index between 2005 and 2015 seems to decline as the values of Economic Complexity Index are -0.03753 and -0.382548 respectively.

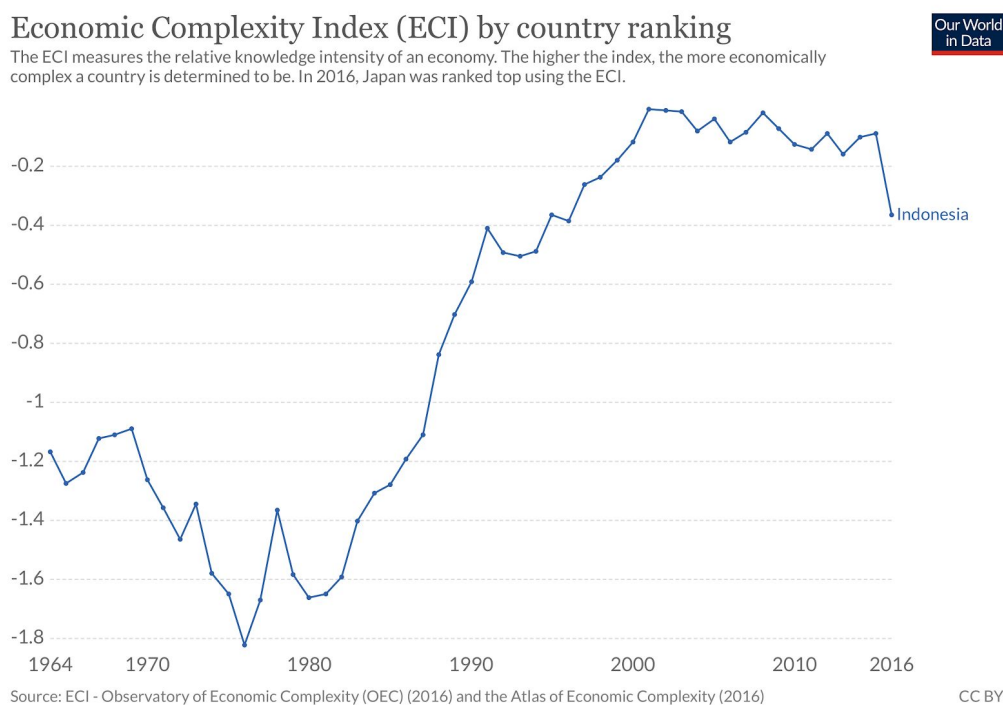


Figure 11 : Economic Complexity Index by country ranking of Indonesia

Source: ourworldindata.org/grapher/economic-complexity-index-eci-by-country-ranking?time=1964..2016&country=IDN

Combination of Indicators

From the chart in figure 11, it shows trade in value added of domestic products and the value of economic complexity index from 2005 to 2015. In 2005, trade in value added for domestic products is around 81.64 percent with the economic complexity index is -0.03753. On the other hand, trade in value added for domestic products is around 87.07 percent with the economic complexity index is -0.38255 in 2015. It infers that Indonesia still have not much knowledge and potential of variety and complexity to develop production innovation that improve the country's production during the rising trend of trade in value added for domestic products.

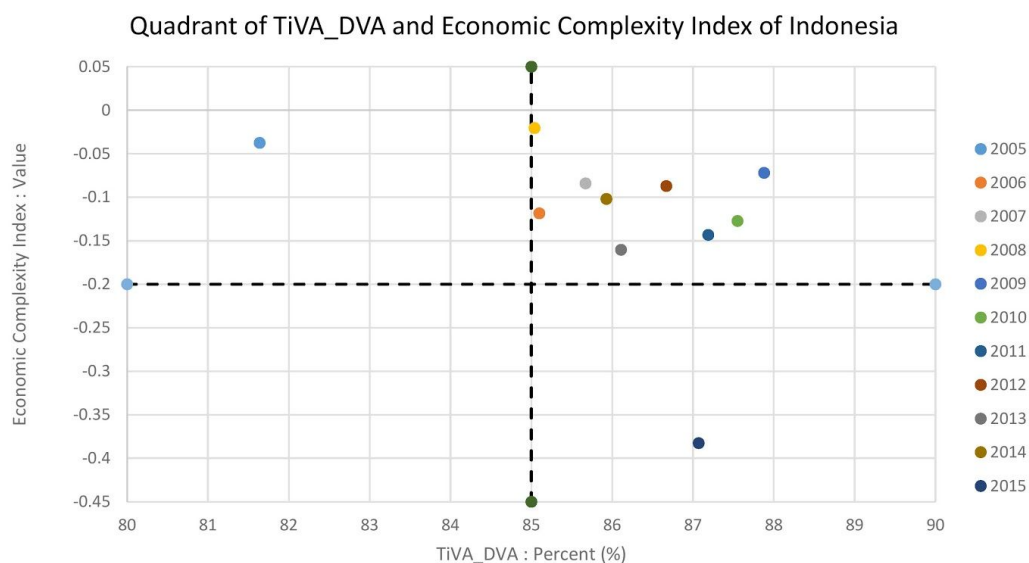


Figure 12 : Quadrant of TiVA_DVA and Economic Complexity Index of Indonesia

Indicators Summary

We used the criteria according to the table 6, to convert the value of the differences from year 2005 and year 2015 of each indicator. into the plus and minus symbols located in table 7, in order to show whether it is a positive change or negative change ,respectively, and the degree of change.

Table 6: Criteria for converting the number value to plus or minus symbols

For multipliers	0.01-0.30	1 plus	-(0.01-0.30)	1 minus
	0.31-0.60	2 plus	-(0.31-0.60)	2 minus
	0.61-0.90	3 plus	-(0.61-0.90)	3 minus
For sector share	0.01-0.50	1 plus	-(0.01-0.50)	1 minus
	0.51-1.00	2 plus	-(0.51-1.00)	2 minus
	1.01-1.50	3 plus	-(1.01-1.50)	3 minus

Table 7 : Results of indicators comparison of the different of multipliers and factor share between year 2005 and 2015, and the number of linkages in 2015

Indicator / Industry	D13T15	D19	D20T21	D26	D45T47	D49T53	D90T96
Global Backward Multipliers	+	+	0	0	0	-	+
Global Forward Multipliers	+++	---	+	+++	-	+++	-
Local Backward Multipliers	+	+	+	0	+	+	+
Local Forward Multipliers	++	-	+	++	+	+++	-
Sector Share on GDP	-	---	0	-	---	++	-
Network Analysis (Numbers of linkage in 2015)	9	26	11	5	30	22	7

* D13T15: Textiles, wearing apparel, leather and related products, D19: Coke and refined petroleum products, D20T21: Chemicals and pharmaceutical products, D26: Computer, electronic and optical products, D45T47: Wholesale and retail trade; repair of motor vehicles, D49T53: Transportation and storage, D90T96: Arts, entertainment, recreation and other service activities.

We have selected 7 industries to be displayed in the table, which can be divided into 3 groups, first, there are 4 industries with the most noticeable change in the global or local multiplier from year 2005 to year 2015, including Textiles, wearing apparel, leather and related products, Coke and refined petroleum products, Computer, electronic and optical products and Transportation and storage. Another industry that we have selected, Wholesale and retail trade; repair of motor vehicles was the industry that had the most numbers of linkage to other industries in the year 2015.

Finally, we chose the Chemicals and pharmaceutical products, Computer, electronic and optical products and, finally, Arts, entertainment, recreation and other service activities industry as they are the most interesting and have high potential to improve the country economics status, upgrading it from middle income country to a high income country, based from the case of Korea and Taiwan.

Policies Summary

From the indicators, we can see that Indonesia's current main industry is natural resources and mining industry which the main export and import is mineral fuels, oil and products from their distillation, but from the quadrant analysis, this product industry while is indonesia is the strong exporter, the industry itself is a losing industry in declining market. Any investment or assisting policies that can be applied to this industry would still not create strong improvements since we facing challenges in both supply and demand side.

Furthermore, according to sector share analysis, Coke and refined petroleum products also decreased from 6.0 percent in 2006 to only 4.5 percent in the year 2015, which we believe that Indonesia now should move away from the mineral fuel and natural products industry.

Following Ha-Joon Chang, we suggest Indonesia to move their supply curve to more sophisticated industry by defying the country's comparative advantage, skipping over some redundant industries to quickly jump started the economy. We have chosen the Computer, electronic and optical products industry that the Indonesia's government should focus as the selected industry since first it is one of indonesia's largest export and import, even if Indonesia was still a net importer for this industry, it is also one of the industries in the winner of growing industry quadrant which we can easily improve to the export of this industry by broadening supply capacity.

We suggest on increasing the protection of local products in this industry, not allowing the import or increase tariff of imported products in this industry, and also improve the incentive for the private sector to research and develop the product in this category further by introducing national R&D facilities, similar to Korea and Taiwan. Another important policy that Indonesia's government should focus on is to provide education system to improve the

quality of the market supply of labor since currently Indonesia has abundant supply of labor and no issue in the aging society, as their median age of the population is approximately 30.2 years old and 42.4% of the entire population is between 25 to 54 years old.

Other policies that we suggest are decline tax rate of this industry's product, improve special economic zone to influence foreign direct investment to the country because it will occur transferable knowledge to upgrade human capital in the country supply curve, establish national funds to support private investment, exempting the corporate income-tax for private sector and reduction or exemption from personal income tax for researchers and experts in this industry (Jatusripitak, 2015).

Finally, after Indonesia successful with the computer and electronic industry, we think that Indonesia should move away to the new industry such as Chemicals and pharmaceutical products, which could develop further into the medical field, in the long run, similar to Thailand's 10 targeted industries by Somkid Jatusripitak, and Arts, entertainment, recreation and other service activities industry, that Indonesia could follows the success of Korea's K-pop (Kwon, 2016), while in the year 2015, the entertainment industry has moderate percent of sector share at 3.5 percent, improved 0.3 percent from the year 2005 and had 7 linkages to other industries, when combined with a large number of Indonesia's population that could potentially support this industry from their media consumption, it could be a promising industry for indonesia in the future.

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Appendix

Id	Label	Timesta...	Degree	Weighted ...	Eccentri...	Closeness Ce...	Harmonic Closene...	Betweenness C...	PageRank	Authority	Hub	Modularit...	Compone...	Clustering ...	Number of...	Eigenvect...
Wholesale and r...	Wholes...	30	5.3	3.0	0.787234	0.873874	239.563255	0.0465...	0.399...	0.3998...	6	0	0.157635	64	1.0	
Coke and refine...	Coke a...	26	5.3	3.0	0.72549	0.81982	113.23625	0.0409...	0.390...	0.3901...	3	0	0.223333	67	0.968296	
Transportation a...	Transp...	22	4.6	3.0	0.672727	0.765766	73.041014	0.0354...	0.348...	0.3485...	6	0	0.257143	54	0.862028	
Mining and extr...	Mining ...	13	4.0	3.0	0.544118	0.626126	15.980541	0.0216...	0.208...	0.2087...	3	0	0.287879	19	0.510165	
Chemicals and p...	Chemic...	11	3.4	4.0	0.506849	0.587838	6.389694	0.0168...	0.204...	0.2043...	1	0	0.444444	20	0.507658	
Machinery and e...	Machin...	11	2.0	3.0	0.569231	0.63964	76.173715	0.0266...	0.191...	0.1911...	5	0	0.218182	12	0.434539	
Mining and quar...	Mining ...	11	3.9	3.0	0.544118	0.608108	6.780102	0.0179...	0.20381	0.20381	3	0	0.533333	24	0.500109	
Other transport ...	Other t...	11	3.3	3.0	0.544118	0.608108	38.450514	0.0199...	0.161...	0.1617...	6	0	0.244444	11	0.406009	
Agriculture, fore...	Agricult...	10	3.9	4.0	0.506849	0.578829	6.356116	0.0156...	0.153...	0.1535...	0	0	0.555556	20	0.38778	
Financial and ins...	Financi...	9	3.1	4.0	0.445783	0.524775	44.932456	0.0148...	0.086...	0.0863...	6	0	0.214286	6	0.218642	
Other manufactu...	Other ...	9	2.7	4.0	0.5	0.565315	24.820714	0.0159...	0.15249	0.15249	6	0	0.464286	13	0.38199	
Paper products ...	Paper ...	9	3.4	3.0	0.506849	0.567568	3.000866	0.0134...	0.177...	0.1773...	6	0	0.571429	16	0.444377	
Textiles, wearin...	Textile...	9	3.8	3.0	0.513889	0.572072	2.243691	0.0135...	0.171...	0.1716...	6	0	0.642857	18	0.431224	
Accommodation a...	Accom...	8	2.9	3.0	0.5	0.554054	5.152381	0.0118...	0.112...	0.1126...	0	0	0.52381	11	0.28948	
Fabricated meta...	Fabrica...	8	1.9	3.0	0.528571	0.59009	23.723302	0.0171...	0.171...	0.1714...	4	0	0.285714	8	0.38973	
Publishing, aud...	Publish...	8	3.2	3.0	0.506849	0.558559	28.042772	0.01198	0.137...	0.1371...	6	0	0.428571	9	0.347587	
Arts, entertainm...	Arts, e...	7	2.7	3.0	0.493333	0.540541	7.916457	0.0106...	0.134...	0.1344...	6	0	0.533333	8	0.338865	
Electrical equip...	Electric...	7	2.7	3.0	0.513889	0.554054	2.908753	0.0120...	0.136...	0.1369...	6	0	0.533333	8	0.338402	
IT and other info...	IT and ...	7	2.5	3.0	0.5	0.545045	21.527997	0.0105...	0.093...	0.0933...	6	0	0.333333	5	0.240922	
Other non-metal...	Other n...	7	2.8	4.0	0.474359	0.529279	0.666667	0.0106...	0.137...	0.1378...	3	0	0.666667	10	0.344607	
Basic metals	Basic ...	6	1.9	4.0	0.486842	0.547297	4.26564	0.0129...	0.158...	0.1583...	2	0	0.533333	8	0.358159	
Manufacture of ...	Manufa...	6	1.7	4.0	0.425287	0.497748	6.223351	0.0144...	0.093...	0.0935...	2	0	0.066667	1	0.206501	
Mining support s...	Mining ...	6	2.7	4.0	0.468354	0.515766	0.396104	0.0093...	0.115...	0.1157...	3	0	0.5	5	0.288924	
Rubber and pla...	Rubber...	6	1.9	4.0	0.486842	0.547297	9.246395	0.0134...	0.154...	0.1540...	1	0	0.6	9	0.349941	
Computer, elect...	Compu...	5	2.9	4.0	0.4625	0.502252	0.0	0.0078...	0.109...	0.1095...	6	0	0.5	3	0.274299	

Figure A1 : the calculated results of network analysis from IO table of Indonesia in 2015, Data Table, Gephi

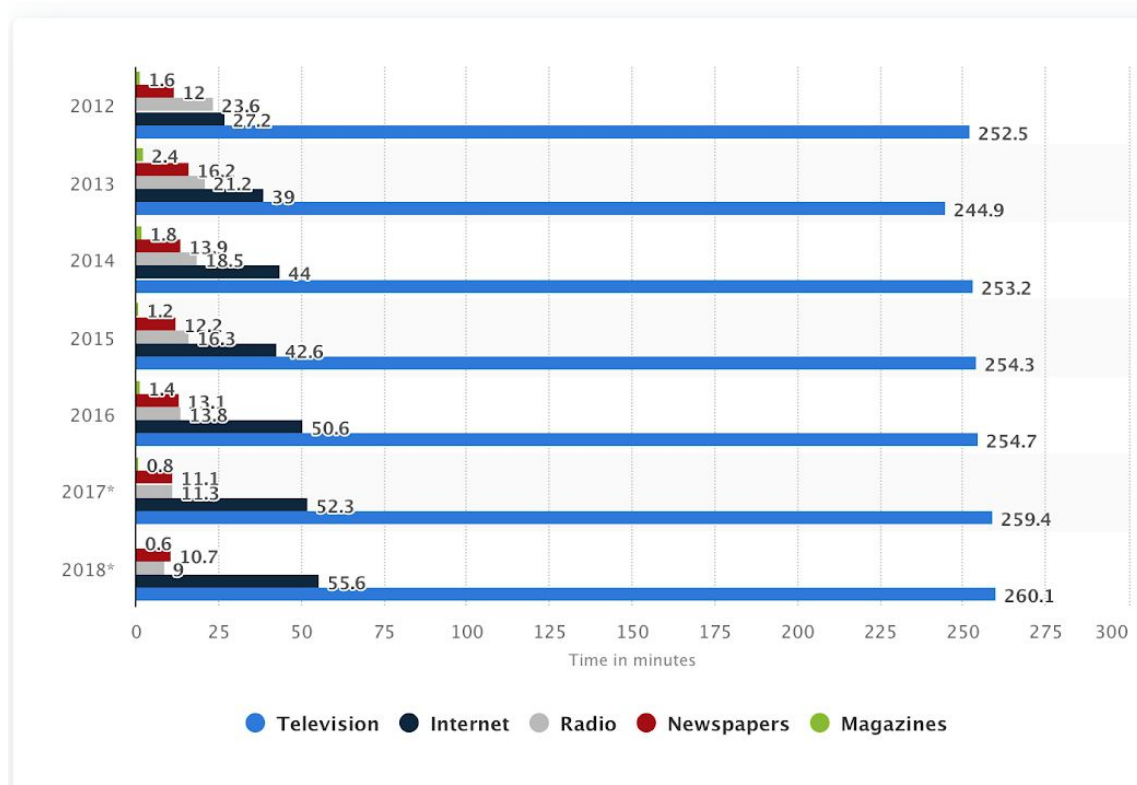


Figure: A2 : Daily time spent with selected media in Indonesia from 2012 to 2018 (in minutes)

Source : <https://www.statista.com/statistics/256307/time-spent-with-media-in-indonesia/>