Manufacturing Industry Development and Phenomenon in Indonesia and Singapore: Lessons for Policy Makers

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Abstract – This study aims to describe manufacturing development and relationship of industry indicators in Indonesia and Singapore. It uses secondary data from statistics institutions in Indonesia and Singapore. Research data involves number of manufacturing industry, number of labour, and output. The period of research is year 2005 – 2012. It was taken in the condition of stabilize economy in the two countries. Research methods involve descriptive statistics and correlation test. The research result shows that the development of manufacturing industry tends to increase, and there are a correlation and causal between business indicators. This gives a positive signal for the business and government. The government of Indonesia can take an insight from the development of manufacturing industry in Singapore. And then, the government of Indonesia can support business cooperation with the manufacturing industry in Singapore. The business cooperation involves main technology and expert. Meanwhile, the manufacturing industry in Indonesia can be driven to increase export of commodity.

Keywords: Manufacturing industry, GDP, worker, correlation

I. BACKGROUND

Wiratraman (2007) has identified many effects of outsourcing in Indonesia. It's are the outsourcing is a neo-liberalism product, minimize in job incentive guarantee, inconsistent in job relation, industry can recruit and layoff easily, legalized modern slavery, and conflict paradigm. Those are labor market flexibility implementation in Indonesia. Studies about outsourcing in other country are also done by Anderton and Brenton (1998), Kotabe and Mol (2004), Munch and Skaksen (2005), Kremic, Tukel and Rom (2006), Chongvilaivan, Hur and Riyanto (2009), Tjandraningsih, Herawati and Suhadmadi (2010).

Linder (2004) has defined the "outsourcing" as "purchasing ongoing services from an outside company that a company currently provides, or most organizations normally provide, for themselves". Kotabe and Mol (2004) have described the "outsourcing process" as "a range of actions within a clearly identifiable time-frame that lead to the transfer to outside suppliers of activities, possibly involving the transfer of assets including people, as well, that were previously performed in-house or procured from other units within the corporate system".

Chongvilaivan, Hur and Riyanto (2009) have investigated the outsourcing in US manufacturing industries. They have concluded that:

1. the downstream materials and service outsourcing have a positive impact on the wages of skilled workers relative to those of unskilled workers and the relative demand for skilled workers, while upstream materials outsourcing has the opposite impact.
2. the nature of the relationship between capital inputs and skilled workers depends on the types of capital input employed in the production process.

This research shows that the development of manufacturing industry in Indonesia, Japan and Singapore tends to increase. It confirms that this industry gives a positive contribution to the economy. The number of workers in the manufacturing industry tends to increase from year to year. It is also supported by increasing of wages.

II. THEORITICAL BACKGROUND

Linder (2004) has defined the "outsourcing" as "purchasing ongoing services from an outside company that a company currently provides, or most organizations normally provide, for themselves". Kotabe and Mol (2004) have described the "outsourcing process" as "a range of actions within a clearly identifiable time-frame that lead to the transfer to outside suppliers of activities, possibly involving the transfer of assets including people, as well, that were previously performed in-house or procured from other units within the corporate system".

Kremic, *et. al*. (2006) had studied many literatures about outsourcing. It's give guidance as follow:

a. *Cost saving. Industries can minimize cost about 9% and increase production capacity about 15%.*
b. *Time saving. Industries use this factor as a main decision.*
c. *Hidden cost. Industries use outsourcing to minimize a hidden cost.*
d. *Core activity. Industries use outsourcing to get a core activity.*
e. *Cash infusion. Outsourcing can drive the ability of cash for industry from selling assets.*
f. *Talent availability. Outsourcing provides a skill worker for industry.*
g. *Re-engineering. Industry has a chance to evaluate business process.*
h. *Corporate culture. Industries can implement a corporate culture easily through outsourcing*
i. *Greater flexibility. Outsourcing will give a flexibility both time and resource for industries.*
j. *Accountability. Industries have a chance to implement an accountability process through outsourcing.*

Munch and Skaksen (2005) have tested the theoretical model of outsourcing. They have found that:

1. *Foreign outsourcing is likely to be biased towards activities intensive in unskilled labor, and in that case our model predicts that foreign outsourcing should benefit skilled labor, while it is ambiguous how wages of unskilled labor are affected.*
2. *With respect to domestic outsourcing, if it corresponds to a pure division of labor effect in the sense as there is no skill bias, we expect that more domestic outsourcing leads to higher wages for all workers. Domestic outsourcing should benefit unskilled workers more than foreign outsourcing, and it should benefit skilled workers less than foreign outsourcing.*

III.METHOD

This research is a quantitative research. It uses secondary data such as GDP of manufacturing industry, number of manufacturing industry, labor or manufacturing industry, export and import of manufacturing industry in Indonesia, Japan and Singapore in the year 2005 – 2012. Secondary data are gotten from BPS (Central Bureau of Statistics of Indonesia), Japan Statistics and Singapore Statistics.

Research method uses descriptive-statistics and correlation. The correlation method refers to Taylor (1990).

IV.RESULT AND DISCUSSIONS

A. Manufacturing Industry Development in Indonesia and Singapore

Manufacturing industry in Indonesia has contributed to Indonesian Economy. It can be inferred from Table 1. It confirms that the value of GDP of manufacturing industry tends to increase. The highest and lowest values of GDP in 2014 were happened at Food and Beverage Industry; and Other Manufacturing Industry; Services Repair and Installation of Machinery and Equipment.

The growth rate of GDP of manufacturing industry in Indonesia was shown at Table 2. It describes that the growth rate of GDP at all subsectors in 2014 tends to positive. It means that all subsectors make a good contribution into economy. The highest and lowest growth rates of GDP in 2014 were happened at Food and Beverage Industry (9.54%); and Coal, Oil and Gas Refining Industry (-2.11%).

Table 3 shows the value added of manufacturing industry in Indonesia in 2008 - 2013. The highest and lowest of value added were happened at food industry; and Printing and Reproduction of Recorded Media industry.

Table 4 describes the value of GDP of manufacturing industry in Singapore. It confirms that the value of GDP from manufacturing industry tends to increase between 2011 until 2014. Meanwhile, in the same time the percentage of GDP from manufacturing industry tends to volatile. This condition shows that the manufacturing industry in Singapore is one of part economic activities but is not as economic leading indicators.

Number of manufacturing industry of Singapore in 2011 and 2012 tends to increase each are 9,008 industry and 9,577 industry. In the same time, the highest and lowest numbers of industry are Machinery & Equipment; and Refined Petroleum Products.

B. Labor of Manufacturing Industry

Table 6 shows the number of workers in manufacturing industry in Indonesia. It confirms that all subsectors have many workers. This is good news for reducing unemployment rate in Indonesia. In 2013 the highest and lowest number of workers has happened at Food (832,411 workers); and Beverages (45,013 workers).

Table 7 explains the number of workers and remuneration in manufacturing industry of Singapore. It describes that the number of workers between years 2010 – 2013 tends to increase. On the other hand, the remuneration in the manufacturing industry tends to increase. Those are a positive signal for Singapore's economy.

C. Descriptive-Statistics and Correlation Test

The descriptive-statistics and correlation test were employed to analyze the relationship between GDP of manufacturing industry and number of labor, GDP of manufacturing industry both in Indonesia and Singapore. The descriptive-statistics can be seen at Table 8. Meanwhile, the

result of correlation test was described at Table 9.

The correlation test shows that: a) GDP of Indonesian manufacturing industry (GDPMI) and GDP of Singapore's manufacturing industry (GDPMS) have a strong and positive correlation; b) GDP of Indonesian manufacturing industry (GDPMI) and Indonesian labor of manufacturing industry (LMI) have a strong and positive correlation; c) GDP of Singapore's manufacturing industry (GDPMS) and labor of Singapore's manufacturing industry (LMS) have a weak and positive correlation; d) Indonesian labor of manufacturing industry (LMI) and labor of Singapore's manufacturing industry (LMS) have a moderate and positive correlation.

D. Lessons for Policy Makers in Indonesia

The development of manufacturing industry in Singapore and Indonesia tend to be different. this can be seen from the number of industries, the number of workers, and the correlation between the two. However, both countries have sought to encourage the development of a competitive manufacturing industry.

Several lessons can be obtained by the policy makers in Indonesia are:

1. The Indonesian government needs to encourage businesses to increase the manufacturing industry output (GDP).
2. The Indonesian government needs to regulate employment policies to improve skills and productivity.
3. The Government of Indonesia plays an important role in improving the welfare of workers in line with an increase in output of industrial manufacturing.

V. CONCLUSION

The conclusion of this research involves:

1. The development of manufacturing industry in Indonesia, Japan and Singapore tend to increase. It confirms that this industry gives a positive contribution to the economy. The number of workers in the manufacturing industry tends to increase from year to year. It is also supported by increasing of wages.
2. The correlation test shows that GDPMI-GDPMS have a strong and positive correlation, GDPMI-LMI have a strong and positive correlation, GDPMS-LMS have a weak and positive correlation, LMI-LMS have a moderate and positive correlation.

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APPENDIX

Table 1. GDP of Manufacturing Industry in the year of 2010 – 2014 at Constant Price 2010 in Indonesia (billion IDR)

Economic Sectors and Subsectors	2010 Amount	2011 Amount	2012 Amount	2013* Amount	2014** Amount
Manufacturing Industry	1,512,760.8	1,607,452.0	1,697,787.2	1,774,097.3	1,856,310.6
Coal and Oil and Gas Refining Industry	233,822.2	233,051.9	227,456.1	223,585.3	218,867.3
Food and Beverage Industry	360,443.1	400,003.7	441,341.7	459,283.0	503,090.6
Tobacco Processing Industry	67,249.4	67,096.8	73,011.4	72,814.0	79,258.6
Textile and Garment Industry	96,306.9	102,561.1	108,753.6	115,913.1	117,682.3
Leather, leather goods and Footwear	19,697.2	21,852.3	20,665.3	21,745.7	22,944.2
Wood Industry, Goods of wood and cork and Woven Goods from Bamboo, Rattan and the like	56,775.1	55,230.9	54,786.9	58,180.6	61,712.3
Industry Paper and Paper Products; Printing and Reproduction of Recorded Media	67,984.8	70,631.6	68,590.4	68,229.4	70,569.1
Industrial Chemistry, Pharmacy and Traditional Medicine	114,332.4	124,230.7	140,101.8	147,248.6	152,973.1
Industrial Rubber Products of Rubber and Plastics	66,763.0	68,152.6	73,307.4	71,945.7	72,777.3
Excavation instead Metal Goods Industry	50,948.3	54,909.8	59,252.4	61,228.7	62,690.9
Basic Metal Industry	54,471.5	61,859.7	60,888.7	67,972.4	71,977.5
Metal Goods Industry; Computers, Electronics, Optics; and Electrical Equipment	130,750.5	142,245.0	158,803.5	173,452.4	178,512.8
Industrial Machinery and Equipment	23,767.2	25,794.5	25,436.7	24,163.8	26,289.2
Transport Equipment Industry	134,260.2	142,815.2	148,905.4	171,165.5	177,915.4
Furniture industry	20,069.3	22,061.8	21,588.5	22,375.4	23,176.7
Other Manufacturing Industry; Services Repair and Installation of Machinery and Equipment	15,119.7	14,954.4	14,897.4	14,793.7	15,873.3

Source: BPS
Note: * and ** are temporary data

Table 2. The Growth Rate of GDP of Manufacturing Industry, 2011 – 2014 at Constant Price 2010 in Indonesia (%)

Economic Sectors and Subsectors	2011 Growth	2012 Growth	2013* Growth	2014** Growth
Manufacturing Industry	6.26	5.62	4.49	4.63
Coal and Oil and Gas Refining Industry	-0.33	-2.40	-1.70	-2.11
Food and Beverage Industry	10.98	10.33	4.07	9.54
Tobacco Processing Industry	-0.23	8.82	-0.27	8.85

Economic Sectors and Subsectors	2011 Growth	2012 Growth	2013* Growth	2014** Growth
Textile and Garment Industry	6.49	6.04	6.58	1.53
Leather, leather goods and Footwear	10.94	-5.43	5.23	5.51
Wood Industry, Goods of wood and cork and Woven Goods from Bamboo, Rattan and the like	-2.72	-0.80	6.19	6.07
Industry Paper and Paper Products; Printing and Reproduction of Recorded Media	3.89	-2.89	-0.53	3.43
Industrial Chemistry, Pharmacy and Traditional Medicine	8.66	12.78	5.10	3.89
Industrial Rubber Products of Rubber and Plastics	2.08	7.56	-1.86	1.16
Excavation instead Metal Goods Industry	7.78	7.91	3.34	2.39
Basic Metal Industry	13.56	-1.57	11.63	5.89
Metal Goods Industry; Computers, Electronics, Optics; and Electrical Equipment	8.79	11.64	9.22	2.92
Industrial Machinery and Equipment	8.53	-1.39	-5.00	8.80
Transport Equipment Industry	6.37	4.26	14.95	3.94
Furniture industry	9.93	-2.15	3.64	3.58
Other Manufacturing Industry; Services Repair and Installation of Machinery and Equipment	-1.09	-0.38	-0.70	7.30

Source: BPS (processed)
Note: * and ** are temporary data

Table 3. The Value Added of Manufacturing Industry in the year of 2008 – 2013 at Market Price in Indonesia (billion IDR)

Industry	2008	2009	2010	2011	2012	2013*
Food	116 763	129 058	156 994	192 190	222 838	224 526
Beverages	5 682	6 759	7 488	7 088	10 796	9 189
Textiles	30 051	33 262	39 623	47 444	47 838	44 410
Confection	24 249	29 090	31 124	32 071	44 002	24 141
Leather, leather goods and Footwear	13 443	14 224	15 678	22 580	26 024	16 555
Wood, Cork (Excluding Furniture) and Woven from bamboo, rattan parr	17 821	17 995	14 300	15 896	19 979	17 169
Paper and Paper Products	36 310	45 457	43 168	60 168	55 640	50 136
Printing and Reproduction of Recorded Media	4 902	6 374	10 740	8 330	6 894	10 099
Chemicals and Products of Chemicals	64 295	67 813	83 298	108 313	126 470	118 043
Pharmaceutical, Chemical Medicinal Products and Traditional Medicine	59 577	74 659	38 574	30 987	13 781	48 640
Rubber, Rubber and Plastics Products from	42 528	42 964	50 573	54 040	59 355	56 206
Base Metal	30 600	30 067	31 770	38 202	38 820	44 499
Metal goods, Not Machines and Fittings	24 071	27 000	28 138	30 631	42 102	49 865
Computers, Electronics and Optics	19 528	22 835	25 388	24 802	28 477	29 621
Electrical Equipment	25 394	27 567	28 800	37 288	49 115	51 645

Industry	2008	2009	2010	2011	2012	2013*
Machinery and equipment ytdl	7 793	7 872	11 612	16 837	19 606	14 229
Motor Vehicles, Trailers and Semi-Trailers	47 817	56 479	109 692	103 738	126 238	121 461
Furniture	6 408	7 463	10 363	11 489	8 423	9 599

Source: BPS
Note: * is temporary data

Table 4. GDP of Manufacturing Industry in the year of 2011 – 2014 at 2010 Market Price in Singapore

Gross Domestic Product (GDP)	2011	2012	2013	2014
GDP AT 2010 MARKET PRICES (Million Dollars)	342,371.5	354,061.3	369,793.0	380,585.0
Goods Producing Industries	90,215.3	92,170.1	94,502.4	97,012.2
Manufacturing	70,118.3	70,342.3	71,517.4	73,392.1
GDP AT 2010 MARKET PRICES (%)	6.2	3.4	4.4	2.9
Goods Producing Industries	7.1	2.2	2.5	2.7
Manufacturing	7.8	0.3	1.7	2.6

Source: Economic Development Board

Table 5. Manufacturing Establishment by Industry in the year of 2006-2012 in Singapore

Number

Industry	2006	2007	2008	2009	2010	2011	2012
Food, Beverages & Tobacco	698	738	781	845	832	813	858
Textiles	95	102	101	105	94	93	99
Wearing Apparel	467	494	505	502	461	446	446
Leather Products	45	44	37	31	25	25	27
Wood & Wood Products	99	106	119	121	116	111	145
Paper & Paper Products	121	119	105	112	109	100	105
Printing & Reproduction of Recorded Media	827	861	866	860	836	815	952
Refined Petroleum Products	18	16	16	14	14	14	14
Chemicals & Chemical Products	262	259	269	283	276	282	302
Pharmaceuticals & Biological Products	42	45	46	46	45	46	52
Rubber & Plastic Products	327	341	339	358	344	341	327
Non-metallic Mineral Products	137	137	139	145	143	146	145
Basic Metals	20	24	33	30	30	30	34
Fabricated Metal Products	1,169	1,223	1,210	1,265	1,269	1,271	1,356
Computer, Electronic & Optical Products	275	287	296	306	295	291	327
Electrical Equipment	214	222	219	250	247	248	258
Machinery & Equipment	1,538	1,623	1,595	1,774	1,704	1,663	1,725
Motor Vehicles, Trailers &							

Semi-Trailers	54	60	56	74	77	73	75
Other Transport Equipment	537	542	897	1,057	1,057	1,044	1,156
Furniture	536	528	548	615	620	653	655
Other Manufacturing Industries	411	395	463	503	496	503	519
Total Manufacturing	7,892	8,166	8,640	9,296	9,090	9,008	9,577

Source: Economic Development Board

Table 6. Number of Workers in Manufacturing Industry in the year of 2008-2013 in Indonesia (person)

Subsector	2008	2009	2010	2011	2012	2013*
Food	685507	676773	675797	742195	884602	832411
Beverages	36 618	37 777	38 914	43 267	46 691	45 013
Tobacco Processing	346 766	336 178	329 877	304 243	324 614	278 953
Textiles	470 857	450 956	482 963	477 387	482 349	427 083
Confection	503 619	510 112	528 579	561 908	600 109	473 594
Leather, leather goods and Footwear	231 423	227 204	234 173	247 426	256 500	220 723
Wood, Cork (Excluding Furniture) and Woven from bamboo, rattan parr	250 986	224 837	221 226	212 313	225 456	221 132
Paper and Paper Products	125 011	121 500	126 438	131 250	129 359	108 794
Printing and Reproduction of Recorded Media	43 187	41 663	42 658	46 006	52 147	48 268
Chemicals and Products of Chemicals	151 100	159 122	152 352	162 031	185 066	182 115
Pharmaceutical, Chemical Medicinal Products and Traditional Medicine	60 000	63 562	63 415	67 632	63 529	54 226
Rubber, Rubber and Plastics Products from	342 721	329 993	357 274	356 334	353 624	357 544
Non Metallic Minerals goods	172 882	168 943	168 868	174 811	193 136	179 479
Base Metal	64 422	62 272	68 623	64 678	60 430	56 582
Metal goods, Not Machines and Fittings	172 329	141 703	155 473	154 779	161 861	156 953
Computers, Electronics and Optics	166 559	156 157	164 273	164 247	158 706	120 771
Electrical Equipment	96 518	100 442	99 988	108 512	115 488	95 779
Machinery and equipment ytdl	38 333	37 738	39 471	48 621	56 905	61 188
Motor Vehicles, Trailers and Semi-Trailers	80 652	83 885	95 629	111 384	118 643	80 949
Furniture	170 646	166 398	199 925	191 356	190 127	174 103

Source: BPS
Note: * is temporary data

Table 7. Number of Worker and Remuneration of Manufacturing Industry in the year of 2010 – 2014 in Singapore

Item	2010	2011	2012	2013	2014p
Employment (Number)	414,176	418,324	424,622	424,505	421,143
Remuneration ($ Million)	17,987	18,965	19,694	20,722	21,257

Source: Economic Development Board

Table 8. The Result of Descriptive Statistics

	GDPMI	GDPMS	LMI	LMS
Mean	1733912.	71342.52	783751.3	422148.5
Median	1735942.	70929.85	787303.0	422824.0
Maximum	1856311.	73392.10	884602.0	424622.0
Minimum	1607452.	70118.30	675797.0	418324.0
Std. Dev.	106291.1	1497.834	92951.04	3017.125
Skewness	-0.054773	0.662003	-0.090545	-0.402734
Kurtosis	1.687038	1.844985	1.475693	1.519116
Jarque-Bera	0.289312	0.514509	0.392718	0.473633
Probability	0.865320	0.773172	0.821717	0.789136
Sum	6935647.	285370.1	3135005.	1688594.
Sum Sq. Dev.	3.39E+10	6730516.	2.59E+10	27309125
Observations	4	4	4	4

Source: Data Analyze

Table 9. The Result of Correlation Test

	GDPMI	GDPMS	LMI	LMS
GDPMI	1	0.939746381145329	0.8489216885245428	0.3803386076045139
GDPMS	0.939746381145329	1	0.6969380285082593	0.04124943679227392
LMI	0.8489216885245428	0.6969380285082593	1	0.5928783099663403
LMS	0.3803386076045139	0.04124943679227392	0.5928783099663403	1

Source: Data Analyze