A Study of Investment Pattern through Economic Sectors-Based in Indonesia

by Syaparuddin Unja

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This study aims to analyse the pattern of investment in Indonesia based on economic sectors and the causal relationship between foreign and local investments. The data was analysed using descriptive and inferential statistics through the Granger Causality Analytic. The result of this study indicated that foreign and domestic investment are relatively the same. These patterns showed that the increasing or the decreasing of foreign investment was followed by the increasing or the decreasing of domestic investment.

Key words: *Investment, Foreign and Domestic investment, Investment pattern and Causality.*

Introduction

Investment is an important component in aggregate demand and is a source of economic growth. Changes in investment not only have an impact on aggregate demand but can also encourage increased productivity in an economy. Investment also plays an important and vital role in driving long-term economic growth (Jongwanich and Kohpaiboon, in Siraj Mustefa, 2014). Moreover, investment is also expected to create jobs for the community while reducing the unemployment rate. Viorela Beatrice Iacovoiu (2012) stated that the impact of investment on employment opportunities is complex and sensitive. In general investment or investment, both in the form of domestic investment (PMDN) and foreign

investment (PMA), depends on the attractiveness of the region and an ease and clarity of investment procedures. If all this is in place, the impact on employment will be positive.

Recognising the importance of investment in encouraging economic growth, and in accelerating the development of a country or region, various efforts have been made by both central and regional governments. These efforts are aimed at attracting and encouraging the development of investment both PMDN and PMA, such as by making fundamental changes related to central regulations as well as regulations at the regional level. Based on the annual report of the Investment Coordinating Board (BKPM) on investment trends by PMA and PMDN, Java remains the destination or location for foreign and domestic investment. In this instance, Java attracts 51.00% of total foreign investment. When viewed by province, West Java, DKI Jakarta and Banten are the regions with the most investment locations. Another interesting phenomenon that can be examined is the development of PMDN investments moving to follow foreign investments, and vice versa. PMDN and PMA are also more likely to move in the same sector.

Literature Review

Investment can be defined as a commitment of a sum of money or other resources that are made now (present time) in the hope of obtaining benefits in the future. In practice, investment is usually associated with a variety of activities related to investing money in alternative assets, both classified as real assets such as land, gold, property or in the form of financial assets, for example marketable securities like stocks, bonds or mutual funds. For smarter and more risky investors, investment activities can also include investing in other, financial assets that are more complex, such as warrants, options, and futures as well as international equity. The basis of investment decisions consists of the expected rate of return, the level of risk and the relationship between return and risk (E. Tandelilin, 2012). John M. Keynes and Irving Fisher both argue that investments are made until the present value of expected future revenues, at the margin, is equal to the opportunity cost of capital. This means that investments are made until the net present value is equal to zero.

According to Jingan in Clen Nwakoby and Alajekwu Udoka (2016), in the terminology of Keynessian, investment refers to the addition of capital equipment that will be able to increase the production of capital goods. Barro in Muhammad S Anwer and RK. Sampath, 1999) state that general investment always leads to activities that involve the use of resources to produce goods and services. Investment in infrastructure is important in less developed countries because infrastructure makes producers use technology, and by introducing technology to producers, infrastructure expansion will directly stimulate productivity. Investment in education and training will produce a more skilled and capable workforce. Investment in agricultural research and services will improve and facilitate the

dissemination of scientific research results that also increases productivity. Investment in HR will create family value and togetherness, which, in turn, will reduce births and increase the desired savings per person, per capita.

Neo Classical and Maxist economists believe that capital accumulation is an engine of economic growth. Capital can be used to increase production capacity. All economic models focus on capacity as one of the central parameters in determining the rate of economic growth. According to the World Bank, high GDP growth happens where the ratio between investment / GDP is relatively high (Muhammad S. Anwer and RK Sampath, 1999).

In an endogenous growth model, investment is a significant factor driving economic growth. Conversely, neoclassic growth theory assumes that investment has a limited role and does not continuously improve economic growth as a factor of production. Investment is also crucial to promoting economic growth (Kongphet Phetsavong and Masaru Ichihashi, 2012). Endogenous growth models developed by Lucas, (1988), Rebelo (1991) and Romer (1986) introduce capital in the form of human capital accumulation, research and development and highlight the external influences that emerge from this type of model (Ghaith Alzaidy et al, 2017). Furthermore, Liesbeth et al in Njeru Benedict Nyaga (2013) states that, in the prediction of investment economic theory, direct foreign investment can create a multiplier effect through both vertical and horizontal spill overs. This includes the transfer of technology and knowledge to domestic companies, the formation of human resources and other specific elements.

Methodology

The method of data analysis used in this study is descriptive and quantitative. The analytical tools (i) examine investment patterns in Indonesia based on island and type of investment sectors through descriptive analysis, i.e. graphics and; (ii) analyse causality between PMDN and PMA investments in Indonesia. This study uses the Ganger Causality formula developed by Juanda, Bambang and Junaidi, (2012), can be seen below:

$$EGt = \sum_{t=1}^{m} \alpha i\, EGt - 1 + \sum_{j=1}^{m} \beta j\, INVt - j + U1t$$

$$INV\, t = \sum_{t=1}^{m} \lambda i\, INVt - 1 + \sum_{j=1}^{m} \delta j\, EG\, t - j + U2t$$

With regards to the formulae, EG is Domestic Investment (as X), INV is Foreign Investment (as Y), m is defined as the Number of lags and u represents an error term. The Granger Causality Test provides four possible results: (i) If $\Sigma aj \neq 0$ dan $\Sigma bj = 0$, demonstrating one-way causality from x to y; (ii) If $\Sigma aj = 0$ dan $\Sigma bj \neq 0$, showing one-way causality from y to x; (iii) If $\Sigma aj = 0$ dan $\Sigma bj = 0$, then no causal relationship between x and y exists and; (iv) If $\Sigma aj \neq 0$ dan $\Sigma bj \neq 0$, then a two-way causality between x and y is evident.

Results and Discussion
Investment Pattern

In the current study, the investment pattern aims to identify the changes of PMDN and PMA investments. The pattern of PMDN and PMA investments for the period of 1980-2016 is relatively similar, meaning that movements in the rise and fall of domestic and foreign investment occur almost simultaneously. Given this, it can be said that PMDN and PMA are interrelated.

Figure 1. Pattern of development of Foreign Investment and Domestic Investment in Indonesia, 1980-2016.
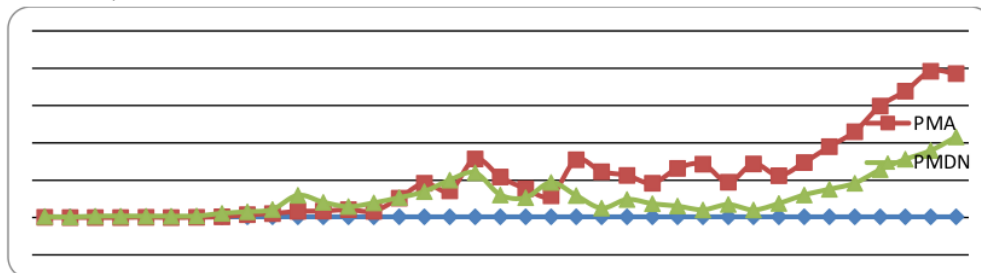
Pattern of Foreign Investment

Given the limitations of the data, the pattern of foreign and domestic investment can only be analysed from 2010 to 2016. In general, during this period, foreign realisation has always increased. In 2010, investment realisation amounted to US$ 16,957.30 million and in 2016 it more than doubled to US$ 34,494.90 million.

Table 1: Development of Foreign Direct Investment Realisation Based on the Investment Activity Report (LKPM) According to Location (US$ million) 2010-2016

No.	Location	Year							Average
		2010	2011	2012	2013	2014	2015	2016	
1	Sumatera	1,489.70	4,130.70	7,286.30	6,696.50	7,658.00	7,444.40	11,196.10	6557.39
	Concentration	8.79	19.19	25.91	20.98	23.68	22.57	32.46	21.94
2	Java	11,498.80	12,324.50	13,659.90	17,326.40	15,436.70	15,433.00	14,772.60	4350.27
	Concentration	67.81	57.25	48.57	54.28	47.73	46.78	42.83	52.18
3	Bali dan Nusa Tenggara	502.7	952.7	1,126.60	888.9	993.4	1,265.10	947.9	953.90
	Concentration	2.96	4.43	4.01	2.78	3.07	3.84	2.75	3.41
4	Kalimantan	2,011.40	1,918.80	3,208.60	2,773.40	4,673.60	5,842.90	2,588.70	3288.20
	Concentration	11.86	8.91	11.41	8.69	14.45	17.71	7.50	11.51
5	Sulawesi	859.1	715.3	1,507.00	1,498.20	2,055.70	1,560.40	2,765.00	1565.81
	Concentration	5.07	3.32	5.36	4.69	6.36	4.73	8.02	5.36
6	Maluku	248.9	141.5	98.8	321.2	111.8	286.2	541.5	249.99
	Concentration	1.47	0.66	0.35	1.01	0.35	0.87	1.57	0.90
7	Papua	346.8	1,345.10	1,234.50	2,414.20	1,414.00	1,155.70	1,682.90	1370.46
	Concentration	2.05	6.25	4.39	7.56	4.37	3.50	4.88	4.71
	Total	**16,957.30**	**21,528.70**	**28,121.70**	**31,918.70**	**32,343.20**	**32,987.60**	**34,494.90**	**28,336.01**

Source: Indonesian Investment Coordinating Board (data processed)

Note: Outside of Oil & Gas Investment Sector, Banking, Non-Bank Financial Institutions, Insurance, Leasing, Investment with permits issued by sector/technical sector, Porto Folio Investment (Capital Market) and Household Investment.

Realisation of foreign investment, based on allocation to the islands, is dominated by Java. Investment reached its peak in 2013 with an investment of US$17,326.40 from a total of US$31,918.70 million or 54.28%. With regards to Table 1, the average realisation of foreign investment between 2010-2016 was US$14,350.27 million or 52.18%. This condition is not

surprising considering that in Java, the pulling factor and driving force of foreign investment, both economic and non-economic, are robust compared to other Indonesian islands. Infrastructural factors, human resources, population, market and other economic features dominate and influence investment decisions. Sumatra is the second location of foreign investment with the average realisation amounting to US$11,196.10 or 21.94%. In 2014, the foreign investment realisation in Sumatra reached 32.46%, while Java stood at 42.83% of total foreign investment realisation.

For Sumatra, the concentration of foreign investment realisation during 2010-2016 was situated in the Riau Islands, with an average investment concentration of 28.39%, 22.47% and 14.83% respectively. This was followed by the Kalimantan Islands where foreign investment was concentrated in East Kalimantan, Central Kalimantan and West Kalimantan with an average concentration of 50.35%, 25.31% and 14.89% respectively. For Sulawesi, foreign investment was focused on South Sulawesi, Central Sulawesi and North Sulawesi, each with 29.60%, 27.27% and 22.88% respectively. While for Maluku Island and Papua, foreign investment centred on North Maluku and Papua at 75.15% and 71.59% respectively.

Kalimantan Island, the third preference for foreign investment in Indonesia, recorded an average of US$.3288.20 million or 11.51% of total foreign investment in Indonesia. This amount is more than double that in Sulawesi at US$.1565.81 million or 5.36% of total foreign investment. A description of the pattern of foreign investment in Indonesia, according to the islands, can be seen in Figure 2.

Figure 2. Pattern of PMA Distribution in Indonesia by Island (%)
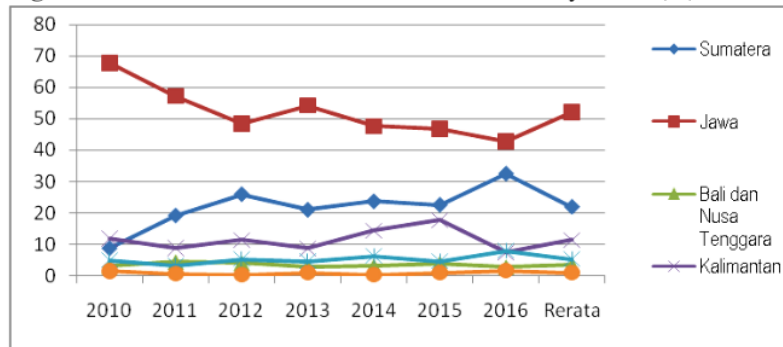
Based on Table 1 and Figure 2 above, it can be concluded that the islands of Java, Sumatra, Kalimantan and Sulawesi are the preferred centres of foreign investment with an investment average of 77.12%. The other islands average 22.88%.

b. Domestic Investment Pattern

In a similar way, the realisation of domestic investment is also concentrated in Java. During 2010-2016, Java Island absorbed Rp.35,140.3 billion to Rp.126,354 billion of total realisation, with an average of Rp.74,096.39 billion per year. Additionally, Sumatra was ranked second as it absorbed Rp.4,224.3 billion to Rp.39,823.5 billion, representing an average of Rp.23,552.13 billion. Kalimantan Island absorbed Rp.13,467.4 billion to Rp.33588.4 billion, representing an average of Rp.21,215.91 billion.

Table 2: Realisation of PMDN Investment in Indonesia According to Islands

Island	Year							Average
	2010	2011	2012	2013	2014	2015	2016	
Sumatera	4224.3	16334.2	14256.3	22913.8	29561.2	37751.6	39823.5	23552.13
Java	35140.3	37176.2	52693	66495.6	97057.2	103758.4	126354	74096.39
Bali dan Nusa Tenggara	2119.3	356.7	3167.8	4400.3	468.9	2893.9	2647.3	2293.457
Kalimantan	14575.7	13467.4	16739.7	28713.6	21419.5	20007.1	33588.4	21215.91
Sulawesi	4337.6	7227.5	4901	3624.2	7113.5	13667.8	13566.2	7776.829
Maluku	0	13.6	323.9	1114.9	156.3	48.2	20.2	239.5857
Papua	229.3	1426.1	100.5	888.3	349.9	1338.6	231.1	651.9714
Indonesia	60626.5	76001.7	92182.2	128150.7	156126.5	179465.6	216230.7	129826.3

Source: Investment Coordinating Board

Given the concentration of domestic investment, Java absorbed 48.91% to 62.17% of total domestic investment with an average of 57.07%. East and West Java and DKI Jakarta provinces comprise the highest concentration of PMDN investment at 36.07%, 25.55% and 15.12% respectively. Sumatra was second with 6.97% to 21.49% of total realized domestic investment and with an average of 18.14%. The provinces of Riau, South Sumatra and North Sumatra represent the highest concentration of PMDN investment with an average of 28.39%, 22.47% and 14.83% respectively.

Kalimantan Island absorbs 11.15% to 24.04% of the total realized domestic investment in Indonesia with an average of 16.34%. The provinces of East Kalimantan, West Kalimantan and South Kalimantan have the highest concentration of domestic investment realisation at

46.06%, 17.39% and 17.18% respectively. Sulawesi absorbs 2.83% to 7.62% of the total realisation of domestic investment in Indonesia with an average of 5.99 %. The provinces of South Sulawesi, Southeast Sulawesi and Central Sulawesi are centres of the highest concentration of domestic investment realisation with an average concentration 51.93%, 14.30% and 12.17% respectively. While for Maluku Island and Papua, domestic investment is concentrated in North Maluku and Papua with 77.40 % and 79.52 % respectively. An overview of the concentration of domestic investment in Indonesia is set out in in Table 3 below and Figure 2 above.
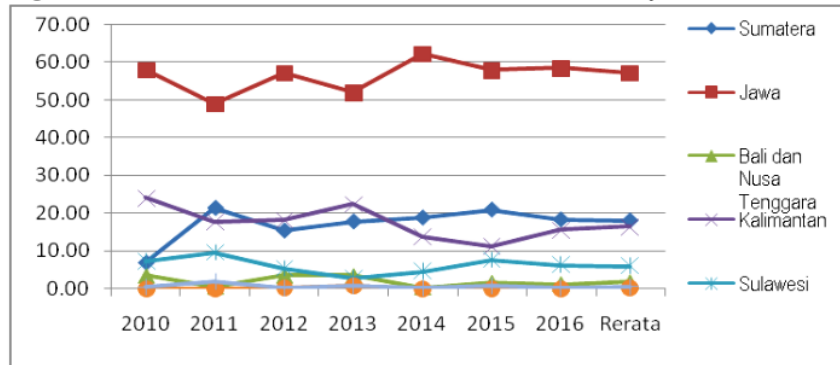
Table 3: Concentration of Domestic Investment in Indonesia by Island

Island	Year							Average
	2010	2011	2012	2013	2014	2015	2016	
Sumatera	6.97	21.49	15.47	17.88	18.93	21.04	18.42	18.14
Java	57.96	48.91	57.16	51.89	62.17	57.82	58.43	57.07
Bali dan Nusa Tenggara	3.50	0.47	3.44	3.43	0.30	1.61	1.22	1.77
Kalimantan	24.04	17.72	18.16	22.41	13.72	11.15	15.53	16.34
Sulawesi	7.15	9.51	5.32	2.83	4.56	7.62	6.27	5.99
Maluku	0.00	0.02	0.35	0.87	0.10	0.03	0.01	0.18
Papua	0.38	1.88	0.11	0.69	0.22	0.75	0.11	0.50
Indonesia	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Indonesian Investment Coordinating Board (data processed)

With regards to Table 3 above, the trend of inter-island concentration fluctuates both for Java and other Indonesian islands. For the period 2010-2016, domestic investment realisation in Sumatra and Kalimantan was alternately positioned, for example in 2011, 2014, 2015 and 2016 Sumatra Island was ranked second. Contrastingly, in 2010, 2012 and 2013, Kalimantan occupied second place in Indonesia. Fourth place was Sulawesi Island, as shown in Figure 3 below.

Figure 3. Domestic Investment Concentration in Indonesia by Island

In light of Table 3 and Figure 3, Java is the overall centre of domestic investment with a concentration exceeding 50% of all investment realisation in Indonesia. Java is clearly the powerhouse of all investment activity across the Indonesian archipelago.

Pattern of Foreign Investment by Sector

Investment patterns by sector can be divided into three groups, namely primary, secondary and tertiary sectors. The primary sector consists of food crops, agriculture, livestock, fisheries and mining. The secondary sector is made up of key industries such as food, textile, leather goods and so on. Lastly, the tertiary sector comprises electricity and water; construction; trade and repair; hotels and restaurants; transportation, warehousing, and communication and housing, industrial areas and offices and other services.

Table 4: Development of Foreign Direct Investment Realisation Based on the Investment Activity Report (LKPM) By Sector 2010-2016 (US$ Million)

No.	Sector	Year							
		2010	2011	2012	2013	2014	2015	2016	Average
1	Primary Sector	3,033.9	4,883.2	5,933.1	6,471.8	6,991.3	6,236.4	4,501.9	5,435.943
	Concentration	18.71	25.07	24.15	22.61	24.51	21.30	15.54	21.70
2	Secondary Sector	3,337.3	6,789.6	11,770.0	15,858.8	13,019.3	11,763.1	16,687.6	11,317.96
	Concentration	20.58	34.86	47.91	55.42	45.63	40.18	57.61	43.17
3	Tertiary Sector	9,843.6	7,801.7	6,861.7	6,286.9	8,519.2	11,276.5	7,774.6	8,337.743
	Concentration	60.71	40.06	27.93	21.97	29.86	38.52	26.84	35.13
	Total	**16,214.8**	**19,474.5**	**24,564.7**	**28,617.5**	**28,529.7**	**29,275.9**	**28,964.1**	**25,091.6**

Source: Indonesian Investment Coordinating Board (data processed)

Note: Outside of Oil & Gas Investment Sector, Banking, Non-Bank Financial Institutions, Insurance, Leasing, Investment with permits issued by sector agencies / technical, Porto Folio Investment (Capital Market) and Household Investment

In terms of the sectors identified above, the highest average in the secondary sector is US$. 11,317.96 million (43.17%), followed by the tertiary sector at US$.11,317.96 million (35.13%) and, then the primary sector at US$5,435,943 (21.70%). Foreign investment in the secondary sector between 2010-2016 was 20.58 to 57.61%. Foreign, direct investment for the secondary sector centred on the metals, machinery and electronics industries (22.03%), the chemical and pharmaceutical industries (20.07%), food industry (17.89%) and, the motor vehicle and transportation industries (15.33%). With regards to the the tertiary sector foreign investment was between 21.97 to 60.71% and localised to transportation, warehouse and communication sub-sectors; electricity, gas and water. Motor vehicle and transportation industries averaged 34.04%, 23.55% and 13.57% respectively. Foreign investment in the primary sector was between 15.54 to 25.07% and centred on mining, food crops and plantation sub-sectors with an average of 69.26 and 28.81% respectively.

Figure 4. Foreign Investment Concentration According to Economic Structure
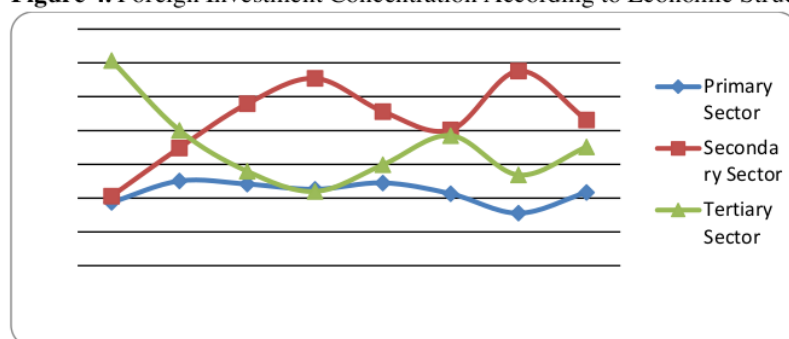
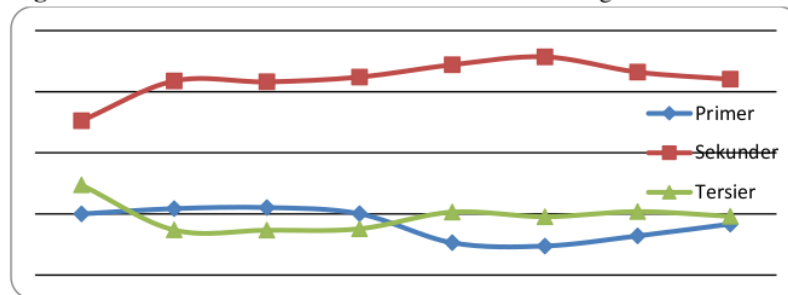***Domestic investment pattern by Sector***

In contrast to the configuration of foreign investment by sectors, PMDN investment patterns are divided into nine sectors and include three economic structures: primary, secondary and tertiary. The primary sector consists of agriculture, hunting, forestry, fisheries and mining and excavation. Electricity, gas and water encompass the secondary sector; whereas the tertiary sector consists of wholesale and retail trade, tourism, transportation, warehousing, and communication, to name a few.

Table 5. Development of PMDN Investment Realisation Based on the Investment Activities Report (LKPM) By Sector Year 2010-2016 (Billion Rupiah)

No.	Sector	Year							Average
		2010	2011	2012	2013	2014	2015	2016	
1	Primary Sector	12131.4	16526.3	20369	25715.6	16520.6	17059.6	27704.6	19432.4
	Concentration	20.01	21.74	22.10	20.07	10.58	9.51	12.81	16.69
2	Secondary Sector	30610	48266.7	58272.5	83035.6	107429.2	128157.5	143617.3	85627.0
	Concentration	50.49	63.51	63.21	64.80	68.81	71.41	66.42	64.09
3	Tertiary Sector	17884.9	11207.7	13540.5	19399.5	32176.5	34248.6	44908.9	24766.7
	Concentration	29.50	14.75	14.69	15.14	20.61	19.08	20.77	19.22
	Total	60626.3	76000.7	92182	128150.6	156126.3	179465.9	216230.8	129826.1

Source: Indonesian Investment Coordinating Board (data processed)

Figure 5. Domestic Investment Concentration According to Economic Structure


Based on an investment activity report (LKPM), the highest average in the secondary sector is Rp.85.627.0 billion or 64.09% of the total domestic investment. Investment in the tertiary sector is an average of Rp. 24,766.7 Billion or 19.22% of total PMDN; while the primary sector average concentration is Rp. 19,432.4 billion or 16.69% of total domestic investment. In terms of the secondary sector, between 50.49 to 71.41% is domestic investment and resides in the industrial sub-sector with an average concentration of 46.26%. This is followed by the electricity, gas and water sub-sector at 12.92% and the construction sub-sector at 4.91%. PMDN investment for the tertiary sector encompasses the transportation, warehousing and communication sub-sectors with an average 12.49%. This is followed by

the real estate and corporate services sub-sectors at 2.77%. The wholesale and retail trades, restaurants and hotels sub-sectors; followed by community, social and individual services each had a respective average concentration of 2.01% and 1.95%.

The concentration of realized domestic investment for the primary sector in Indonesia was between 9.5% to 22.10% of the total domestic investment. An investment of 9.95% and 6.74% of the total domestic investment resided in the agriculture, hunting, forestry and fisheries and mining and quarrying sub-sectors.

Figure 6. Domestic Investment Distribution Patterns in Indonesia According to the Economic Sector
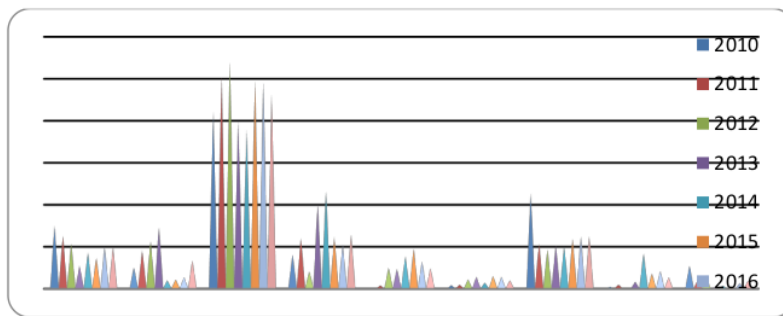
Causality Relations between PMDN and PMA in Indonesia

With regards to Table 6 below, applying Causality Test Lag 1 to Lag 5 between PMDN and PMA investment, found a causality relationship to exist. This condition shows that, on the one hand, the development of PMDN investment is a factor highly considered by investors (PMA) to realise investment. The development of investment (PMA) is a barometer to improve and increase investment prospects in Indonesia. The causality between PMDN and PMA, especially in Lag 2 and 3, can also indicate that PMA and PMDN investors are interrelated via business or collaborative partnerships. In this context, there could be cooperation or joint ventures between PMD and PMA in various fields and at different levels. For example, the output of PMDN companies becomes input for PMA companies and vice versa.

Table 6: Granger Causality Test Value of PMDN and PMA

PMDN against PMA	Prob. value	PMA against PMDN	Prob. value
Lag 1	0.0307	Lag 1	0.0570
Lag 2	0.0009*	Lag 2	0.0389*
Lag 3	0.0008*	Lag 3	0.0437*
Lag 4	0.0013	Lag 4	0.2204
Lag 5	0.0020	Lag 5	0.3979

Note: * meaning is significant

Table 6 above also illustrates, in Lag 1, 4 and 5, a significant directional relationship between PMDN and PMA. Furthermore, a significant relationship in the direction of foreign to domestic investment in Indonesia, namely at Lag 1, clearly exists. In light of this, Lag 1, 4 and 5 PMDN significantly influences PMA.

Conclusions and Recommendations

In general, domestic investment (PMDN) and foreign investment (PMA) relatively have the same pattern. Both PMA and PMDN investment patterns are situated in Java. The average concentration of each is 52.18% and 57.07% of the average realisation of foreign and domestic investment. There is no shift in the concentration of investment in other islands across the archipelago. Patterns of foreign and domestic investment by sector are both concentrated in the secondary sector with an average concentration of 47.13% and 64.09%, respectively. Significantly, a causality relationship between PMA and PMDN exists, especially in Lags 2 and 3 and with and additional direct relationship between PMDN and PMA in lags 1, 4 and 5.

Recommendations

Prudent fiscal and monetary policy are indispensable in order to increase the flow of direct, foreign investment (including domestic investment). Such policies, applied across all sectors, allows for the eventual construction of basic infrastructure and encourages inclusive and sustainable investment. Investment centres are not just primarily situated on Java. It is recommended that a more comprehensive and in-depth study examines the existence of foreign investment (PMA) and domestic investment (PMDN) causality relationships.

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