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Intellectual Property and Foreign Direct Investment: An Empirical Analysis

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ABSTRACT

With the help from both domestic and international markets, ASEAN countries are able to catch-up with the latest economic development if they can sustain high economic growth for a long-period of time. To do so, the resources available in the countries such as capital and labors should fully be utilized up to the optimum level. The capital itself, can be in many forms such as investment. Since most of the ASEAN countries are categorized as developing countries, the reliance on foreign direct investment (FDI) as a source of growth is highly needed as it helps the economy to step on a higher stage of economic development via the roles of foreign experts and technological transfer. In ensuring higher level of investment, there is a need to ensure high level of intellectual property protection since it assists in promoting invention, innovation and new business development. In opposite, lacking in protection might discourage foreign investors to invest in the countries, thus limiting the ability of the countries to grow further. Therefore, the aim of this paper is to examine whether strong intellectual property protection will really help in attracting more foreign investors to invest in ASEAN-5 countries. Using annual data from 2007 to 2016, panel data estimation using random effect is employed. It was found that the ASEAN-5 countries should strengthen their intellectual property protection in order to stimulate higher foreign investments. Nevertheless, in between copyright and patents, copyrights protection gives significant effect to the FDI inflows relative to the latter one. It indicates that the countries are slowly moving out from the production-based economy and catching-up towards a digital economy.

Keywords: *ASEAN-5, foreign direct investment, intellectual property protection, digital economy, copyrights*

INTRODUCTION

Due to fruitful benefits of regional economic integration, ASEAN had recorded among the highest economic growth relative to other advanced economies such as United States, European Union and Japan since 2013 to 2015. The growth was mainly due to various initiatives taken to face global shocks and uncertainties. Besides, massive income generation from agricultural products such as rubber and palm oil were significant in propelling the regional economic growth especially for the global producers such as Indonesia and Malaysia. However, sole reliance on natural resources are no longer relevant at this point of time due to transformation of economic structure (Mohamed Nour, 2015). Moving forward, the need to focus on robust productivity growth via invention and innovation activities are crucial as outlined in the ASEAN Economic Community Blueprint 2025 (ASEAN, 2015). These needs can be addressed via the

promotion of domestic as well as foreign direct investment (FDI) particularly in driving the globalization, intensified competition as well as rapid diffusion of information and communication technology (Jorgenson et al. 2016).

However, due to globalization and rapid development in technology, product imitation is a threat to the economic growth. Instead of buying the original product, people can easily get the imitated product at a cheaper price. If the government allows this trend to prolong, foreign investors would shift their investment location to other countries. As a result, the economy might not be able to sustain high level of economic growth in a long period of time. Hence, to avoid any disruption to the economy, the protection of the intellectual property (IP) is essential to encourage more FDI, technological transfer as well as stimulate creativity, invention and innovation. Thus, the aim of this paper is to examine whether strong intellectual property protection will really help in attracting more foreign investors to invest in ASEAN-5 countries.

LITERATURE REVIEW

Theoretically, the nexus between IPR protection and FDI was highlighted by Dunning (1993) with its OLI paradigm. It illustrates multinational corporations' activities in terms of ownership (O), localization (L) and internalization advantages (I). Initially, the multinational firms have no market power in the local market. In competing with local producers, they must have certain ownership advantages such as advanced production technology, patented products, trademarks, reputation or other assets to remain viable. This ownership advantage explains their presence in the local market. The second element of OLI paradigm, localization advantage, explains the roles of multinational firms in exporting their products to the local market due to differences in costs, quality factor, government policies, international transport and communication costs, and overcoming trade restrictions. Meanwhile, the last element, internalization advantage, illustrates their preferences in having full control over the production processes in the local market. Instead of giving license on their assets to the local firms, their decision to have full control is mainly due to high transaction costs in regulating and legalizing the contracts.

The protection of IPR has acquired an essential role in attracting more FDI, hence stimulating higher economic growth. Empirically, its standing on FDI is still subject to debate. The conflict exists whether stronger protection of IPR stimulate or discourage FDI. Obviously, the issue of IPR protection is highly centered in developing countries. Weak protection may increase the number of imitative products, which ultimately makes a host country becomes less attractive for foreign investors (Ivus et al., 2015; Javorcik, 2004). Instead of investing in countries with weak protection, foreign investors would prefer to focus on distribution of their imported products only. On the other hand, a case of India shows that weak protection helps to establish the country into a successful pharmaceutical industry due to an ease of product imitation (Ivus et al., 2015). Local pharmaceutical firms may easily imitate foreign pharmaceutical products due to lower level of technological complexity. However, for an industry that produces complex products, the number of product imitation is very limited even if weak protection is imposed in a country. In this case, higher FDI can be seen from India's perspective especially in the manufacturing sector due to low imitation abilities.

Strict IPR protection can be translated into greater security that can enhance the process of industrial development in developing countries. This can be seen in the countries such as Taiwan, Japan, Saudi Arabia and Vietnam from 1985 to 2010 (Hsu & Tiao, 2015) as well as Egypt from 1985 to 2011 (Elshamy, 2015). By adopting Ordinary Least Square (OLS) and System Generalized Method of Moments (System GMM), it was found that more multinational firms would be keen to invest and shift their production plants to these countries due to greater security on the intellectual property (Cook & Liu, 2015). Their decision to invest is partly due to the host countries' investment environment (Zhang & Yang, 2016).

From the other perspective, a country that enforce strict protection may experience less trading activities especially on imitative products (Javorcik, 2004). More market power is gained by small number of innovators who can easily obtain higher market shares. Their abilities to monopoly power is very high, leading to a welfare loss to the society. Eventually, it distorts the assimilation of technological diffusion and knowledge transfer among local firms due to high cost of transfer.

Nevertheless, negative relationship between IPR protection and FDI has been found in the cases of Malaysia, Indonesia, India and Thailand from the period of 1985 to 2010 (Hsu & Tiao, 2015). It might be due to other external factors which were uncontrollable such as the costs of investment as well as country risks. Besides, FDI seems to be higher if a country is enforcing weak IPR protection since the motive of investment is mainly due to asset-seeking motive. The intention to acquire more knowledge-based assets are dominant even without the consent of the original asset owners (Yoo & Reimann, 2017). The advantage is on the developing countries who are able to acquire knowledge on new technology via FDI without having to pay high prices due to weak IPR protection.

In conclusion, the nexus between IPR protection and FDI is still ambiguous. Owing to the debate, this paper seeks to empirically investigate the relationship between IPR protection and inward FDI in ASEAN-5 countries.

METHODOLOGY

By integrating both series, the effects of IPR protection and other variables on the level of FDI were examined among ASEAN-5 countries from the year of 2007 to 2016. Out of the ten ASEAN countries, namely Malaysia, Singapore, Thailand, Philippines and Indonesia were selected based on their economic performance. Therefore, in investigating the effects of IP protection on the FDI inflow in ASEAN-5 countries, equation 1 as shown below can be employed.

$$FDI_{it} = \beta_0 + \beta_1 IPR_{it} + \beta_2 PAT_{it} + \beta_3 COP_{it} + \beta_4 GDP_{it} + \beta_5 INF_{it} + \beta_6 EXC_{it} + \varepsilon_{it} \quad (1)$$

FDI represents the net inflow of foreign direct investment (The World Bank Group, 2019) while GDP denotes the growth rate of ASEAN-5 countries (CEIC Data, 2019). It is included as one of the variables that is widely used in estimating FDI via the Gravity Model.

IPR represents the total intellectual property rights protection while PAT represents patterns protection which is derived from Ginarte-Park Patent Protection. COP denotes copyright protection that is derived from BSA Global Software Survey. These three variables namely IPR, PAT and COP are included as a proxy of ownership advantage in the OLI paradigm. In this regard, the multinational firms would prefer to invest in a country that value their advanced technology and innovative products via the enforcement of IPR protection such as patent and copyrights. The protection of IPR can be expressed in the form of an index with the value ranges between 0 (the weakest protection) to 10 (the strongest protection). It comprises the protection of the intellectual property rights, patent protection as well as copyright piracy. The value of IPR is derived from the Global Competitiveness Index, World's Economic Forum.

Following this, INF dictates the level of inflation rate as a proxy of the second element in the OLI paradigm, localization advantage (CEIC Data, 2019). It is expected that the multinational firms invest in the ASEAN-5 countries due to differences in costs. Finally, EXC represents the level of exchange rate of the local currency per US$. It explains the final element in the OLI paradigm, internalization advantage. In this case, the multinational firms are attracted to invest in ASEAN-5 countries due to their preferences in having full control over the production processes in the local market. Instead of giving license on their assets to the local firms, they prefer to have full control in order to avoid high transaction costs in regulating and legalizing contracts with the local players.

In this regard, panel data analysis was employed due to its ability in omitting variable bias and heterogeneity problems. Besides, it is able to capture the complexity of social behavior relative to time series analysis. Given three types of panel data analysis, this paper used random effects (RE) model in estimating equation 1. RE is chosen as we allow for individual country's differences in response to the FDI inflows. For example, each country in the ASEAN-5 countries have different macroeconomic conditions, which can be measured by using GDP and inflation. Besides, their exchange rate is also different. By allowing these differences, the RE model is preferable as compared to other panel estimations such as pooled ordinary least square (POLS) and fixed effect (FE) model. POLS is not preferable as it assumes all ASEAN-5 countries as the same. Even though FE model does not assume all countries to be the same, it is also less preferable since it does not allow any differences between the countries. Statistically, the model selection in between POLS, FE and RE can be determined by using the BP-LM test (in between POLS and RE) as well as Hausman test (in between RE and FE). Finally, the Generalized Least Square (GLS) is applied to achieve the best result. All variables except IPR, PAT and COP are transformed into logarithm form in order to improve heteroscedasticity problem. In testing the stationarity level for each variable, the Levin, Lee and Chu (LLC) test was adopted with a Newey-West bandwidth selection. The appropriate number of lags were selected by using the Schwarz Information Criterion (SIC).

RESULTS

By adopting the Levin, Lee and Chu (LLC) stationarity test, it was found that all variables are stationary at level except for the exchange rate. As illustrated in Table 1, the result for this variable should be interpreted with caution.

Table 1: Levin, Lee and Chu's Stationarity Test at Level

Variable	Statistics	Prob
FDI	-5.41388	0.0000***
IPR	-5.15782	0.0000***
PAT	-815.465	0.0000***
COP	-16.2422	0.0000***
GDP	-27.8973	0.0000***
INF	-10.7197	0.0000***
EXC	-1.07967	0.1401

*** denotes stationary at 1% confidence level

To ensure no multicollinearity problem exists among all explanatory variables, a correlation analysis is conducted. The results as shown in table 2 illustrates that all IPR variables namely IPR, PAT and COP are highly correlated with each other. Hence, these variables are estimated separately in four different models (refer table 3). This measure is conducted in order to avoid multicollinearity problem if they are included in the same regression.

Table 2: Correlation matrix among all explanatory variables

	IPR	PAT	COP	GDP	INF	EXC
IPR	1	0.7602	0.9314	-0.0112	-0.3278	-0.4969
PAT	0.7602	1	0.7337	0.0312	-0.3593	-0.5058
COP	0.9314	0.7337	1	-0.0779	-0.4228	-0.5881
GDP	-0.0112	0.0312	-0.0779	1	0.3489	0.1410
INF	-0.3278	-0.3593	-0.4228	0.3489	1	0.5032
EXC	-0.4969	-0.5058	-0.5881	0.1410	0.5032	1

Due to high correlation between IPR variables, the regression results are categorized into four different models as shown in table 3. Explanatory variables such as GDP, INF, EXC are included in all regressions. In avoiding multicollinearity problem, the first set of regressions include IPR as the variable that explains the total IPR protection while the second set includes the patent protection (PAT). Meanwhile, the third model includes the copyright protection (COP) only as a measure of IPR protection.

The findings as shown in table 3 illustrates the importance of GDP and exchange rate stability in stimulating more FDI in ASEAN-5 countries. It is no doubt that higher economic growth will attract investors to invest in the region as previously tested in the Gravity Model by various researchers (Tomohara, 2016; Bello & Subasat, 2012). In terms of the exchange rate, its fluctuation against US$ leads to higher costs for the investors to give license on their assets to the local firms. Hence, they would prefer to invest and control the production processes on their own as the exchange rate appreciates. It is consistent with one of the OLI paradigms as highlighted by Dunning (1993). However, all three sets of regressions confirmed that inflation rate is not significant in attracting more FDI into the region. Indirectly, it illustrates that there is no difference between the costs of conducting businesses in the local and foreign markets. Even there is high cost of living in ASEAN-5 countries, it does not give any significant influence in attracting FDI into the region.

From the perspective of the IPR protection, the total IPR protection as shown in the first set of regression is significantly influencing FDI inflow in ASEAN-5 countries. Similarly, copyright protection as shown in the third set of regression also behave in the same way. Parallel to Dunning (1993), gaining competitive advantage from the IPR protection would motivate multinational companies to invest in the region. The competitive advantage can be translated into greater security on the foreign intellectual property that helps in ensuring the stability of their position in the host country (Cook & Liu, 2015; Zhang & Yang, 2016).

Table 3: Panel data regression results (random effects model)

	1	2	3
Constant	14.47621 (0.0000)***	22.81353 (0.0000)***	19.20773 (0.0000)***
GDP	0.995623 (0.0007)***	1.193152 (0.0001)***	1.062958 (0.0006)***
INF	-0.662637 (0.1510)	-0.571302 (0.1940)	-0.290695 (0.5520)
EXC	0.261183 (0.0095)***	-0.063069 (0.4803)	0.228981 (0.0861)*
IPR	4.166880 (0.0003)***		
PAT		-0.442835 (0.6678)	
COP			1.439947 (0.0206)**
R-squared	0.495150	0.382924	0.387322
Adjusted R^2	0.437452	0.312401	0.317302
F-statistics	8.883365	5.429774	5.348892
Prob (F-stat)	0.0000***	0.00165***	0.0018***
Jarque-Bera	3.602752	0.425718	1.787580
Prob (J-Bera)	0.165072	0.808270	0.409102

*** denotes significant at 1% confidence level
** denotes significant at 5% confidence level
* denotes significant at 10% confidence level
Figures in parentheses are probabilities of t-statistics.

Nevertheless, this is not the case for the patent protection since the coefficient is insignificant in explaining the FDI. This might be due to the change of the world's economic structure from traditional resource-based economy into a knowledge-based as well as digital economy. Apart from that, the motive of the investors is lesser on the utilization of the resources in the ASEAN-5 countries. Cheaper resources which are highly needed in the traditional and manufacturing sectors can easily be accessible in other Asian countries such as Laos and Vietnam (Ni et al., 2017; Ghazal & Zulkhibri, 2015). These two countries might need higher protection of patent in order to stimulate more FDI. The higher protection which is deemed to be more important in the current state of development is on the copyright protection rather than the patent protection. It can be illustrated in the third model of regression whereby the coefficient of the copyright protection is significant in explaining the inflow of FDI. Basically, the copyright protection includes the protection of original works in the forms of architecture, computer software and programs, artworks and etc. It can be seen in the cases of China and United States among the main investors in the ASEAN countries that have invested in various development projects such as infrastructure, transportation and etc.
Based on the results of the probability of the F-statistics as well as the Jarque Bera test, it can be concluded that all models as shown in table 3 are correctly specified. The residuals are also normally distributed.

CONCLUSION

This paper investigates the nexus between GDP growth, exchange rate, IPR protection and inflation rate on the inflow of FDI in ASEAN-5 countries from 2007 to 2016. The findings revealed that the total IPR protection in ASEAN-5 countries does contribute significantly to the inflow of FDI into the region. Besides, copyright protection is significant in stimulating higher FDI relative to the patent protection. Indirectly, it shows that the ASEAN-5 countries are moving towards knowledge-based economy and digital economy. The copyright protection is highly essential in ensuring more FDI in the areas of architecture, ICT development and etc. Moving forward, the patent protection is not significant since the production-based economy is becoming less relevant among the foreign investors in ASEAN-5 countries. Their preferences in investing in the manufacturing sector have been changed to other Asian countries such as Laos and Vietnam especially. To remain viable and competitive in the eyes of the world, the ASEAN-5 economies have to transform themselves by setting interrelated policies to induce new creation of knowledge and technology acquisition. Moreover, the roles of other determinants of the FDI such as GDP growth and the stability of the exchange rate cannot be neglected.

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