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The Mediating Effect of Information Asymmetry on IFRS and Foreign Direct Investment

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ABSTRACT

This study examines the mediating effect of information asymmetry on the relationship between IFRS and FDI inflows in ASEAN countries. The hypotheses were empirically tested using a sample of ASEAN 6 from 2001 to 2016 and for information asymmetry measurement, this study applies Bid-ask spread and Illiquidity measurement introduced by Amihud (2002). This study also fulfils the three steps required for mediation analyses based on casual steps approach. The results indicate that information asymmetry mediates the relationship between IFRS and FDI inflows. Additionally, this study also demonstrates that IFRS adoption is a determinant factor for FDI inflows and eventually economic growth. This study provides evidence regarding the outcomes of IFRS from the aspects of information asymmetry reduction and FDI inflows enhancement. Therefore, the outcomes of this study may be useful for adopter and non-adopter countries to understand the economic consequences of IFRS. The findings may provide important inputs to policy makers of Indonesia and Vietnam who are contemplating adopting IFRS. The positive relationship between IFRS and FDI inflows, provides evidence that IFRS is an important determinant of FDI inflows and eventually economic growth.

JEL Classification: F21, M41

Keywords: ASEAN countries; casual steps approach; foreign direct investmet; IFRS; information asymmetry

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INTRODUCTION

FDI has been generated much interest amongst researchers, economists and policymakers. The Organization for Economic Co-operation and Development (OECD) considers FDI inflows as a main driver of economic growth especially for developing countries. Table 1 which provides a summary of FDI inflows of countries around the world shows that there is a dramatic increase in FDI inflows in developing countries, from $619 billion in 2000 to $1.348 trillion in 2016, a growth of 119 percent (World Bank Report 2017). This impressive FDI growth is not observed in other group of countries. Therefore, understanding the determinants or main driver of FDI in developing countries is imperative.

Several elements were found in past studies to be major determinants of FDI such as, market attractiveness, openness to trade, labor wage, governance effectiveness and natural resource (Rogmans 2013; Nasreen and Anwar 2014; Sulaiman, Azman and Ismail 2016; Sengupta and Puri 2018). Moreover, Bevan and Estrin (2004), Ramasamy and Yeung (2010), Sulaiman, Azman and Ismail (2016) and Sengupta and Puri (2018) also show that GDP, labor wage, GDP growth, openness to imports and exports (Open), infrastructure, exchange rate, long-term interest rate, quality of government infrastructure, regulatory environment, risk, and education level are among the most important determinants of FDI.

Additionally, Dunning (1980) and (1993) developed the OLI paradigm, an acronym for Ownership, Location and Internationalization advantages, in order to explore the FDI determinants. According to OLI paradigm, each country requires these three advantages together to meet FDI inflows enhancement. The ownership advantages such as unique technological capabilities or strong brand name. The location advantages return to countries' location properties such as special standards, regulations, taxes and tariffs. The internationalization advantages is about reasons to outsource certain activities to different countries, such as, they are able to do it cheaper or they have more local market knowledge.

One of the major country's location advantages that has been highlighted and globally recognized is the financial reporting standard (Dunning 2001; Jayeoba et al. 2016; Owusu et al. 2017). Typically investors attract to the locations that have higher financial information quality. This is because the provision of financial information quality is a reflection of the level of a country's corporate transparency and comparability (Chipalkatti et al. 2007; Owusu et al. 2017). Therefore, the lack of a globally accepted financial reporting standard might be considered as an important inadequacy in FDI enhancement (Gordon et al. 2012; Akisik 2014; Owusu et al. 2017; Ugwu and Okoye 2018).

In general, the International Financial Reporting Standard (IFRS) compliance might be an important solution to overcome the FDI inadequacy. Many countries are required IFRS in order to raise transparency, comparability and in the long run information asymmetry reduction (Chen et al. 2014; Cho et al. 2015; Turki et al. 2017). Based on The Eurasian Association of Accountants and Auditors (EAAA), countries adopt IFRS, because, IFRS provides transparency in accounting information and reflect the real economic situation, which will enables users of financial statements to make the right economic decisions.

Based on the World Investment Report (WIR), countries need to implement IFRS to increase transparency and attract more FDI. IFRS leads to financial information quality, transparency and comparability improvement (Zaidi and Paz 2015), which consequently leads to reduce information asymmetry between companies and their external parties (Ball 2006; Li et al. 2017). Reducing information asymmetry leads to greater transparency of financial information and may result in lower information processing costs associated with FDI (Zaidi and Huerta 2014; Özcan 2016; Ugwu and Okoye 2018). IFRS affects financial decisions by reducing information processing costs, primarily for foreign investors who are familiar with IFRS, thus facilitating cross-border capital flows or FDI (Gordon et al. 2012; Boolaky et al. 2018).

Evidences from past studies show that with adoption of IFRS, investors are more likely to rely on the financial statements of foreign companies and increase FDI (Gordon et al. 2012; Abad et al. 2017; Lungu et al. 2017; Kapellas and Siougle 2018). Studies by DeFond et al. (2011), Gordon et al. (2012), Pricope (2017) and Lungu et al. (2017) found positive effect of IFRS on FDI inflows. Despite of above positive findings, Nnadi and Soobaroyen (2015), Owusu et al. (2017) and Ugwu and Okoye (2018) reported that IFRS adoption does not affect FDI in Africa. However, thus far, to the best of knowledge, no studies have empiricaly examined the meadiating role of information asymmetry in the IFRS-FDI relationship. Therefore, this study investigates the association of IFRS and FDI inflows through information asymmetry.

FDI inflows enhancement in Association of Southeast Asian Nations (ASEAN) is most significant compare with other world's region (UNCTAD 2017). Table 1 demonstrates a dramatic increase in FDI inflows of ASEAN countries, from $21 billion in 2000 to $128 billion in 2016 by 505 percent growth. This is consistent with WIR's assertion that ASEAN improved their policy to attract higher FDI to achieve economic growth (UNCTAD 2017). Therefore, ASEAN provides a good setting to explore FDI determinants. Within ASEAN, two countries, which is Indonesia and Vietnam have yet to adopt IFRS (IASB 2016)[1], however these countries received high FDI inflows. Hence is it true that IFRS really leads to FDI enhancement through information asymmetry reduction?

Based on this concern, this study provides evidence regarding the outcomes of IFRS from the aspects of information asymmetry reduction and FDI inflows enhancement. Therefore, the outcomes of this study would be important and should be of interest to policy makers of not only countries that have already IFRS, but also to policy makers in countries that are contemplating adoption. Additionally, the outcomes of this study also contribute to the extant literature.

This paper is organized as follows. The next section provides a brief review of the relevant literature. This is followed by discussion of hypothesis development, research design and sample, research models and findings. The final section presents the limitation of the study and suggestions for future research.

Table 1 FDI Inflows

FDI Inflows	Total (Trillion)	2000 (Billion)	2005 (Billion)	2016 (Trillion)
World's FDI Inflow, 211 countries	34.909	1.456 (Trillion)	1.541 (Trillion)	2.440
Developed Countries FDI Inflows, 35 countries	16.345	833.079	989.393	1.021
Developing Countries FDI Inflows, 149 countries	17.535	616.946	516.737	1.348
ASEAN Countries FDI Inflows, 10 countries	1.515	21.310	42.999	128.84 (Billion)
Economies in Transition Countries FDI Inflows, 17 countries	1.028	6.040	35.397	70.438 (Billion)

LITERATURE REVIEW

IFRS has been adopted by most countries around the world with the purpose of improving reporting quality, reducing information processing costs, and ultimately reducing information asymmetry among capital market participants within and across countries (Gordon et al. 2012; Aliabadi and Shahri 2016; Persakisa and Iatridis 2017; Abad et al. 2017). The reduction in information asymmetry would occur with IFRS implementation for three potential reasons. First, IFRS significantly increases accounting disclosure by providing additional disclosure guidelines. Second, IFRS significantly increases comparability across countries, which facilitates monitoring and benchmarking across companies. Finally, specifically, IFRS increases transparency which help investors make better decisions. Overall, according to Zhai and Wang (2016) the main goal of IFRS is to help companies to provide useful financial information and to help investors to make good investment decisions. Therefore, IFRS is created to reduce the information asymmetry between investors and companies by helping investors to have better investment's risk understanding and thus make more rational decisions.

Significant effect of IFRS on information asymmetry improvement, financial information quality and consequently more transparency are observable in previous studies (Ball 2006; Beijerink 2008; Epstein, 2009; Al Mutawaa and Hewaidy 2010; Okpala 2012; Ahmed et al. 2013; Lourenço and Branco 2015; Zaidi and Paz 2015). Leuz and Verrecchia (2000) concurred that IFRS results in better transparency of financial reporting and reduce information asymmetry and enhance market liquidity. Chen et al. (2006) in China, Leuz and Verrecchia (2000) and Armstrong et al. (2008) in EU, Kim (2011) Cormier (2014) and Abad et al. (2017) in Korea, Canada and Spain, reported positive consequences of IFRS on information asymmetry improvement.

Evidences from past studies show that with adoption of IFRS, investors are more likely to rely on the financial statements of foreign companies and increase FDI (Gordon et al. 2012; Abad et al. 2017; Lungu et al. 2017; Kapellas and Siougle 2018). Gordon et al. (2012) examined the effect of IFRS adoption on FDI inflows using

[1] For detailed information visit: https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/.

124 countries, for the period of 1996 to 2009. The study supported the argument that IFRS adoption is positively associated with FDI inflows and the findings is only significant for developing economies, but not for developed economies. Lungu et al. (2017) also investigated on association between IFRS and FDI in emerging countries European area from 1996 until 2014. The study support findings of Gordon et al. (2012) and show IFRS adopter countries are more likely to subsequently benefit from higher FDI inflows enhancement, than non-adopters countries.

Despite of above studies which reported the positive association between IFRS and FDI, Nnadi and Soobaroyen (2015) reported a negative effect of IFRS on FDI. Relying on a panel dataset of 34 African countries over a 20-year period, the study found that full IFRS adoption is negatively associated to net FDI. Owusu et al. (2017) examined whether developing countries that adopt IFRS will experience higher FDI inflows and same with Nnadi and Soobaroyen (2015) found a non-supportive results in association between IFRS and FDI inflows. Ugwu and Okoye (2018) also found the results similar with Owusu et al. (2017) and Nnadi and Soobaroyen (2015). The study examined effect of FDI on economic growth in Nigeria, Ghana and South Africa after IFRS and found FDI leads to Gross Domestic Product (GDP) enhancement; however, after IFRS adoption FDI leads to decrease in GDP. However, to date, no study have examined the relationship between IFRS and FDI inflows through information asymmetry.

Specifically, if IFRS helps investors to have better assessment of existing investment opportunities by increasing transparency and comparability, liquidity will be increased and the adverse selection costs will be reduced (Myers and Majiuf 1984). Therefore, by reducing adverse selection costs or information asymmetry improvement, IFRS would have an impact on the supply of foreign capital (Ramamurti 2012; Özcan 2016; Ugwu and Okoye 2018; Vinh Vo 2018). Indeed, information asymmetry may lead to decrease in FDI inflows. However, IFRS with increasing in level of transparency and comparability leads to liquidity and information asymmetry improvement and help investors to predict and have better economic decision-making.

In sum up, extant empirical studies indicated mixed evidences as to whether IFRS leads to FDI enhancement and whether IFRS leads to information asymmetry reduction. Additionally, the mediating role information asymmetry is mediating in association between IFRS and FDI inflows. Therefore, this study is looking to add knowledge and fill the gap with investigation on effects of IFRS on information asymmetry and FDI inflows in ASEAN countries as developing countries.

HYPOTHESIS DEVELOPMENT and RESEARCH METHODOLOGY

Countries with IFRS implementation signal to the financial markets that companies within these countries are following generally accepted global accounting standards. The underlying benefit of IFRS is to provide transparent, comparable and reliable financial information to decision makers. In addition to the benefits for investors, IFRS facilitates the development of world trade, which in turn promotes the economic growth of the adopting countries. IFRS affects financial decisions with reducing information processing costs, primarily for foreign investors who are familiar with IFRS, and facilitating cross-border capital flows. Thus, by reducing information-processing costs or information asymmetry, IFRS can also have an impact on FDI and ultimately leads to economic growth.

Despite solid theoretical support for such relation, there is no study, which examined the mediating effects of information asymmetry on association of IFRS and FDI inflows. Therefore, based on the above discussion and the assertion of signaling theory, this study hypothesizes that:

H_1: Information asymmetry mediates the association between IFRS and FDI.

Research Models

This study applies a panel data research design and employs Ordinary Least Square (OLS) estimation method. For the mediating effect of information asymmetry in relationship between IFRS and FDI inflows, the casual step approach developed by Baron and Kenny (1986) is specified by this study. Generally, mediation is a third variable effect that informs the relation between two variables by explaining how or why the two variables are related (Fairchild et al. 2009; Iacobucci 2012). The framework for a simple mediation model is drawn in figure 1, which is denoted by Hayes (2009).

In this framework, X is independent variable, Y is dependent variable, M is mediating variable, *a* and *b* are indirect effect of the mediator on Y, and *c'* is direct effect of X on Y with the effect of the mediator. The top

part of the figure displays the total effect of independent variable (X) on dependent variable (Y), whereas the bottom part displays the introduction of the mediator (M). In this figure, *c* represents the total effect of independent variable on dependent variable, *c'* represents the direct effect of independent variable on dependent variable after controlling for the proposed mediator.

In the bottom part of figure 1, Y is the dependent variable, X is the independent variable, M is the Mediating variable, *c* is total effect, *c'* is the direct effect of the independent variable on the independent variable for the effect of the mediating variable, *a* and *b* are indirect effect, φ is the intercept in each models, and $\mathcal{E}$ is the corresponding residual in each models.

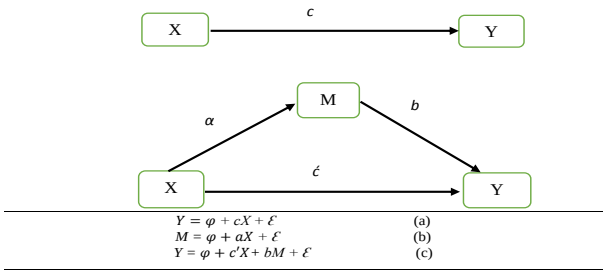

Figure 1 Simple Mediation Model

The casual step approach introduced by Baron and Kenny (1986) has three steps for testing a mediation relationship. First of all, independent variable (X) and mediator variable (M) need to have significant relationship. In second step, independent variable (X) and dependent variable (Y) should be significantly associated. Baron and Kenny (1986) believed that a significant *c* coefficient can be viewed as a necessary condition for testing mediation. Without a significant *c*, the causal steps approach leads to the conclusion that an indirect effect does not exist because there is no overall effect to mediate. Hence after passing the first and second steps then can be proceed with final step. Finally, the mediator variable (M) should be significantly associated with dependent variable (Y) after controlling the independent variable (X). These three steps are assessed by estimating three regression equations presented in Figure 1.

After finding a significant indirect effect, *a* and *b*, if there is no longer a significant direct effect of X on Y, *c'*, researchers report that the mediator perfectly, completely, or fully mediates the X on Y effect. While, researchers report that the mediator partially mediates the X on Y effect if direct X on Y effect after controlling for the mediator remains significant, but absolute value of the direct effect is smaller than total effect ($|c| > |\acute{c}|$) (Fairchild et al. 2009; Iacobucci 2012). Therefore, the schematic model for testing the hypothesis of this study and estimating models could be depicted in Figure 2.

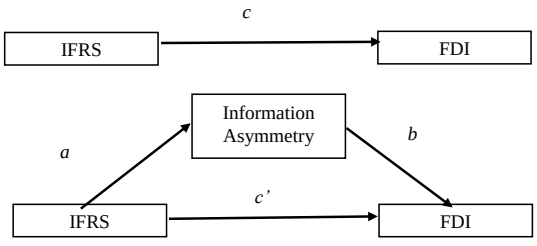

Figure 2 Schematic model for testing the mediation hypothesis

In first step, information asymmetry (mediator variable) need to be significantly associated with IFRS (independent variable) (*Indirect effect (a) ≠ 0*). In second step, the dependent variable (FDI inflows) and independent variable (IFRS) need to have significant relationship (*total effect ≠ 0*). Finally, in third step, the mediator variable (information asymmetry) should be significantly related with dependent variable (FDI inflows) after controlling the independent variable (IFRS) (*Indirect effect (b) ≠ 0*). Table 2 presents the equation models which are applied by this study, separate coefficients for each equation should be estimated and tested.

Table 2 Hypothesis testing models and steps

Model (1), First Step;

$$IA_{i,t} = \beta_0 + \beta_1 IFRS_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 GDPCAP_{i,t} + \beta_4 GDPG_{i,t} + \beta_5 OPEN_{i,t} + \beta_6 Inflation_{i,t} + \beta_7 EXCH_{i,t} + \beta_8 Edu_{i,t} + \beta_9 NODA_{i,t} + \beta_{10} Voice_{i,t} + \beta_{11} GovEff_{i,t} + \beta_{12} Reg_{i,t} + \beta_{13} Rule_{i,t} + \beta_{14} Cor_{i,t} + \beta_{15} Labor_{i,t} + \beta_{16} GFC_{i,t} + \varepsilon_{i,t}$$

Model (2), Second Step

$$LnFDI_{i,t} = \beta_0 + \beta_1 IFRS_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 GDPCAP_{i,t} + \beta_4 GDPG_{i,t} + \beta_5 OPEN_{i,t} + \beta_6 Inflation_{i,t} + \beta_7 EXCH_{i,t} + \beta_8 Edu_{i,t} + \beta_9 NODA_{i,t} + \beta_{10} Voice_{i,t} + \beta_{11} GovEff_{i,t} + \beta_{12} Reg_{i,t} + \beta_{13} Rule_{i,t} + \beta_{14} Cor_{i,t} + \beta_{15} Labor_{i,t} + \beta_{16} GFC_{i,t} + \varepsilon_{i,t}$$

Model (3), Third Step

$$LnFDI_{i,t} = \beta_0 + \beta_1 IFRS_{i,t} + \beta_2 IA_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GDPCAP_{i,t} + \beta_5 GDPG_{i,t} + \beta_6 OPEN_{i,t} + \beta_7 Inflation_{i,t} + \beta_8 EXCH_{i,t} + \beta_9 Edu_{i,t} + \beta_{10} NODA_{i,t} + \beta_{11} Voice_{i,t} + \beta_{12} GovEff_{i,t} + \beta_{13} Reg_{i,t} + \beta_{14} Rule_{i,t} + \beta_{15} Cor_{i,t} + \beta_{16} Labor_{i,t} + \beta_{17} GFC_{i,t} + \varepsilon_{i,t}$$

FDI is natural logarithm of Foreign Direct Investment, IA is information asymmetry measured by Amihud (2002) and Bid Ask Spread, IFRS, the value of 1 if the IFRS is required/ permitted by countries and 0 otherwise, Size is logarithm of GDP, GDPCAP is GDP per capita scaled by 1000, GDPG is GDP Growth measured by dividing normal GDP with current year population, OPEN is absolute value of exports plus imports, Inflation is natural logarithm of Inflation, EXCH is annual year end exchange rates measured by national currency, EDU is Education level, NODA is net official development assistance and official aid received, Voice is Voice and Accountability, GovEff is Governance Effectiveness, Reg is regulatory Quality, Rule is Rule of Low, Cor is Control of Corruption, Labor is Labor wage rate, GFC is Global Financial Crisis.

Definition of Variables

Independent variables of this study is IFRS. This study applies dummy variable equal to 1, if IFRS is implemented by country and dummy variable equal to 0, otherwise. The definition is consistent with assessment of prior studies about the impact of IFRS on FDI (Gordon et al. 2012; Lungu et al. 2017). In order to measure the FDI inflows as dependent variable, the natural logarithm of FDI inflows is applied by this study and its data source is World Development Indicator (WDI) by Word Bank.

Mediating variable of this study is information asymmetry. Macroeconomic data are not available for information asymmetry measurement. Therefore, following with Bharath et al. (2009), Abad et al. (2017) and Yaacob et al. (2017), this study measures information asymmetry using microstructure approach and data are collected form DataStream (Equity data source). Market microstructure proxies of information asymmetry is tied up with market liquidity/illiquidity and adverse selection cost is linked between information asymmetry and market liquidity/illiquidity (Amihud and Mendelson 1986; Amihud 2002). This study employs Bid Ask Spread measurement (BidAsk) for liquidity, and employs illiquidity measurement introduced by Amihud for illiquidity (Amihud 2002; Abad et al. 2017).

Information asymmetry occurs when in an economic transaction company has more and better information than investor. Companies transact with liquidity-motivated investors or uninformed investors and with illiquidity-motivated or informed investors. Companies gain profit from transactions with uninformed investors because they are trading against the companies' spread. And companies lose profit from transactions with informed investors because they collect private information about firm value before trading, therefore prevailing information asymmetry and illiquidity in the pricing process (Nagar et al. 2018).

BidAsk is the difference between the highest price of a stock that investor is willing to pay (bid price) and the lowest price of a stock that is acceptable by companies (ask price) (Leuz and Verrecchia 2000). This difference provides compensation to the investors who risk in their investment and ensure capital market liquidity. In general, the less BidAsk equals to the more market liquidity. In other words, existence of information asymmetry between companies and investors leads higher BidAsk or higher difference between Bid and Ask prices.

The BidAsk contains order processing cost, inventory-holding cost and adverse selection cost (Callahaa et al. 1997). Order processing cost is the cost spent by traders to settle clearing transactions. Inventory-holding cost is the cost spent by traders to hold a number of shares to fulfill investor demand. Adverse selection cost is the cost requested by companies because they accept the risk when involved in transactions with informed investors.

Adverse selection costs arise from the companies' informational disadvantage or information asymmetry in transaction with informed investors.

Companies create spreads between bids and ask prices to maximize the difference between profit from transactions with uninformed investors and loss from transactions with informed investors. Or in other words, when companies find that transactions with informed investors are increasing, they will spread the adverse selection cost, thus BidAsk will increase or information asymmetry will occur (Callahaa et al. 1997). Therefore BidAsk is used as the information asymmetry measurement by this study. Consistent with past studies BidAsk is estimated based on equation 1 as follows;

$$BidAsk_{it} = \frac{AskPrice - BidPrice}{[\frac{AskPrice + BidPrice}{2}]} \quad (1)$$

In react with informed investors companies supply their own disclosure. However, since investors in their trading and companies in their disclosure choice are self-interest agents, hence there is a possibility that investors and companies alter firm value uncertainty for their own benefit (Core 2001; Nagar et al. 2018). Informed investors have the positive and significant effect on stock returns. If informed investors anticipate higher market illiquidity, they will price stocks, therefore, they expect higher stock return (Amihud 2002). Barry and Brown (1984) proposed that the higher stock return is compensation for less or imbalanced information for investors. Therefore, can be concluded that illiquidity are increasing in the asymmetry of information between companies and investors (Glosten and Milgron 1985; Kyle 1985; Amihud 2002; Amihud et al. 2015). Therefore, this study employs illiquidity measurement introduced by Amihud (2002) which measures the sensitivity of stock price to dollar trading volume to measure information asymmetry (Amihud et al. 2015; Abad et al. 2017; Hur and Chung 2018). The Amihud (Illiquidity) is estimated based on equation 2 as follows;

$$Amihud = Illiquidity_{idt} = \sum_{t=1}^{idt} \frac{|Return_{idt}|}{(dollar)\ trading\ volum_{idt}} \quad (2)$$

Stock illiquidity (Amihud) is defined here as the average ratio of the daily absolute return to the (dollar) trading volume on that day. $Return_{idt}$ is the return on stock *i* on day *d* of year *t* and $(dollar)\ trading\ volum_{idt}$ is the respective daily volume in dollars. Higher value of Amihud means the market is less liquid and higher information asymmetry problem.

This study uses monthly data for information asymmetry measurements to cover excel limitation. The monthly data for each company in every ASEAN country has been used and only values with positive sign and non-zero values are considered. As well as, the monthly data is calculating and at the end of the process, mean value is obtaining for each year in every ASEAN country. This is how this study transfer the monthly to yearly data to make a match with the other variables in macro level.

This study considers some control variables which explored by past studies as factors that affect FDI inflows (Abad et al. 2017; Gordon et al. 2012; Lungu et al. 2017). For instance, Size (Gross Domestic Product (GDP in Current US$)), GDP per capita (GDPCAP), GDP Growth (GDPG), Exchange rates (EXHC), Education level (EDU), Net official development assistance and official aid received (NODA). As well as, based on past studies FDI has direct relationship between inflation and economic growth (Saleem et al. 2013), hence, inflation also considered as control variable.

Better economic environment and country governance lead more FDI (Kayalvizhi and Thenmozhi 2018). Therefore, this study uses the next five control variables, voice and accountability (Voice), government effectiveness (GovEff), regulatory quality (Reg), rule of law (Rul) and control of corruption (Cor), as corporate governance factors that attract FDI inflows. Finally, based on Dornean et al. (2012), this study also considered Global Financial Crisis (GFC) as control variables which affects directly the level of FDI. Control variables data

are collected form WDI and Worldwide Governance Indicator (WGI) is data source for corporate governance factors.

Sample Selection

This study uses ASEAN countries as sample. ASEAN countries consist of ten members, Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Laos, Philippines, Singapore, Thailand and Vietnam. All ASEAN companies are potential sample of this study for measuring information asymmetry. However, some restrictions need to be imposed in the sample selection process. First, companies, which do not have needed data for each information asymmetry measurements, are excluded. Second, companies with Zero and Negative value after information asymmetry measurement, as well as outliers, are excluded.

Data for this study was collected from 2001 to 2016. This study uses 2001 as the starting year for data collection as it is the year that FDI data became available in database for all ASEAN countries. However, because of availability of data for information asymmetry measurement, Brunei Darussalam, Laos, Cambodia and Myanmar are excluded from this analysis. As well as, the information asymmetry measurements data are available from 2008 for Vietnam. Therefore, the total sample for information asymmetry measurements consist ASEAN 6 and a total of 26,156 unbalanced observations after omitting not available data and data with negative sign. Subsequently, the total sample in macro level for examining equation models consist of ASEAN 6 and a total of 89 observations. Table 3 provides a summary of data collection of this study.

Table 3 Summary of data collection

ASEAN	Year	Micro Obs	Companies	Total Obs	IA Obs
Brunei	2001-2016	-	-	16	-
Cambodia	2001-2016	-	-	16	-
Indonesia	2001-2016	3,631	466	16	16
Malaysia	2001-2016	7,767	754	16	16
Myanmar	2001-2016	-	-	16	-
Laos	2001-2016	-	-	16	-
Philippines	2001-2016	2,281	209	16	16
Singapore	2001-2016	5,729	607	16	16
Thailand	2001-2016	4,268	556	16	16
Vietnam	2001-2016 and 2008-2016	2,480	514	16	9
Total		26,156	3,106	160	89

RESULTS

The descriptive statistics of the research variables before and after IFRS are presented in Table 4. According to this table, the mean value of Amihud decreased after IFRS, from 3.718 to 1.0381. Similar to Amihud, the mean value of BidAsk also indicates a reduction after IFRS, from 0.052 to 0.043. Moreover, the mean values of FDI increased after IFRS, from 21.456 to 25.724. The FDI enhancement after IFRS is consistent with findings of past studies (Gordon et al. 2012; Lungu et al. 2017).

Table 4 Descriptive statistics of ASEAN 10

	Before IFRS						After IFRS					
	Mean	Max	Min	Skew	Kurto	Obs	Mean	Max	Min	Skew	Kurto	Obs
FDI	21.456	25.425	0.000	-0.042	2.534	116	22.439	25.724	0.000	-0.100	3.678	44
Amihud (ASEAN 6)	3.716	8.451	0.665	0.527	1.622	69	1.038	2.587	0.647	1.779	4.323	19
BidAsk (ASEAN 6)	0.052	0.090	0.013	0.036	1.643	69	0.043	0.061	0.012	0.558	1.910	19
IFRS	0.000	0.000	0.000	NA	NA	116	1.000	1.000	1.000	NA	NA	44
COR	0.899	2.326	0.047	0.876	2.993	116	0.822	2.124	0.029	1.088	3.446	44
GDPCAP	8.295	53.238	0.139	1.837	3.087	116	11.695	56.957	0.951	1.783	4.597	44
GDPG	3.385	4.726	2.143	0.442	2.161	116	3.653	4.756	2.978	0.736	2.240	44
GFC	0.155	1.000	0.000	1.905	4.628	116	0.045	1.000	0.000	1.364	2.048	44
GOVEFF	0.808	2.437	0.014	0.913	3.208	116	0.799	2.237	0.000	0.650	2.502	44
INFLATION	6.936	41.509	-22.091	0.803	4.299	116	1.812	10.255	-17.46	-0.400	1.517	44
LABOR	46.758	95.033	10.063	0.475	1.916	116	56.785	92.744	15.189	0.032	2.191	44
EDU	2.740	3.966	0.864	-0.528	2.769	116	3.077	3.961	2.026	-0.499	2.187	44
EXCHANGE	5.155	9.949	0.223	-0.003	1.231	116	4.319	9.996	0.223	0.308	1.664	44
NODA	16.541	22.831	-15.107	-0.221	4.459	116	15.120	22.855	-16.32	-0.986	5.570	44
OPEN	127.910	441.604	0.167	1.640	4.553	116	127.339	370.686	0.200	0.479	2.621	44
REGUL	0.852	2.344	0.048	0.871	2.605	116	0.786	2.261	0.004	0.963	2.787	44
RULE	-0.289	1.707	-1.740	0.601	2.672	116	-0.137	1.832	-1.438	0.770	2.807	44
SIZE	10.712	11.970	9.245	-0.203	1.863	116	11.035	11.615	10.057	-0.691	1.810	44
VOICE	0.850	2.233	0.001	0.565	2.100	116	0.805	1.850	0.000	0.396	1.993	44

Variables' definitions as mentioned in Table 2.

Table 5 Correlation between variables except IA (ASEAN 10)

	FDI	SIZE	GDPC	GDPG	GOV	INFL	EDU
FDI	1						
SIZE	0.438	1					
GDPC	0.152	0.087	1				
GDPG	0.247	0.357	0.852	1			
GOVE	0.088	-0.19	0.6	0.367	1		
INFLA	-0.07	-0.154	-0.262	-0.422	-0.083	1	
EDU	0.154	0.563	-0.221	0.157	-0.595	-0.13	1
EXCH	-0.127	-0.133	-0.632	-0.674	-0.517	0.203	-0.104
NODA	-0.097	-0.158	-0.269	-0.427	0.015	0.156	-0.272
OPEN	0.352	0.257	0.641	0.62	0.572	-0.325	-0.28
REG	0.016	-0.303	0.465	0.156	0.829	0.177	-0.594
RULE	0.29	0.391	0.81	0.907	0.414	-0.41	0.05
VOICE	-0.198	-0.591	-0.339	-0.536	0.089	0.373	-0.254
COR	0.047	-0.206	0.392	0.055	0.747	0.056	-0.727
LAB	0.17	0.311	0.757	0.902	0.356	-0.38	0.173
GFC	0.036	0.023	-0.001	0.023	0.028	-0.009	0.044

Variables' definitions as mentioned in Table 2.

Table 5 Cont.

	EXCH	NODA	OPEN	REG	RUL	VOIC	COR	LAB	GFC
FDI									
SIZE									
GDPC									
GDPG									
GOVE									
INFLA									
EDU									
EXCH	1								
NODA	0.39	1							
OPEN	-0.373	-0.04	1						
REG	-0.381	0.084	0.27	1					
RULE	-0.64	-0.319	0.81	0.164	1				
VOICE	0.323	0.227	-0.429	0.375	-0.6	1			
COR	-0.117	0.258	0.449	0.759	0.128	0.133	1		
LAB	-0.785	-0.4	0.525	0.133	0.842	-0.56	-0.01	1	
GFC	-0.02	0.055	-0.001	-0.01	-0.018	0.017	0.05	0	1

Variables' definitions as mentioned in Table 2.

According to Gujarati and Porter (2009) the presence of multicollinearity could affect the precision of multiple regression analysis as it makes the estimates of regression coefficients unreliable. The correlation values less than 0.8 shows that there is no collinearity issue among variables (Gujarati and Porter 2009). As seen in Table 5, there is multicollinearity problem between GDP per capita, GDP Growth and Rule of Low. There is also multicollinearity problem between GDP Growth, Rule of Low and Labor Wage Rate. The multicollinearity problem is also seen between Governance Effectiveness and Regulatory Quality. This problem is also seen between Open and Rule of Low. Therefore, this study excludes GDP Growth, Regulatory Quality, Rule of Low and Labor Wage Rate from regression models.

As seen in Table 6, there is multicollinearity problem between Amihud and Exchange, between GDP per capita, Control of Corruption, Governance Effectiveness, and Open. There is also multicollinearity problem between Governance Effectiveness and Open, between Education and Control of Corruption. Therefore, Exchange, Control of Corruption, Governance Effectiveness and Open are excluded from analyzes.

Table 6 Correlation between variables except FDI (ASEAN 6)

	AMIHUD	SIZE	GDPCAP	ECXH	EDU	COR	GFC	GOV	INFLA	NODA	OPEN	VOICE
AMIHUD	1.000											
SIZE	0.233	1.000										
GDPCAP	-0.454	0.015	1.000									
EXCH	0.963	0.294	-0.576	1.000								
EDU	0.137	0.214	-0.761	0.255	1.000							
CORR	-0.234	-0.141	0.825	-0.329	-0.938	1.000						
GFC	0.051	-0.023	-0.025	0.040	0.005	0.003	1.000					
GOVEFF	-0.538	-0.178	0.886	-0.684	-0.795	0.771	-0.013	1.000				
INFL	0.604	0.038	-0.349	0.586	0.073	-0.182	0.161	-0.338	1.000			
NODA	0.262	-0.268	-0.013	0.232	-0.212	0.162	0.059	0.000	0.241	1.000		
OPEN	-0.464	-0.342	0.844	-0.627	-0.766	0.781	-0.003	0.918	-0.351	0.049	1.000	
VOICE	0.490	0.025	-0.236	0.430	0.254	-0.332	0.031	-0.266	0.167	0.029	-0.108	1.000

Table 6 Cont.

	BIDASK	SIZE	GDPCAP	EXCH	EDU	COR	GFC	GOV	INFLA	NODA	OPEN	VOICE
BIDASK	1.000											
SIZE	-0.413	1.000										
GDPCAP	0.111	0.015	1.000									
EXCH	0.237	0.294	-0.576	1.000								
EDU	-0.396	0.214	-0.761	0.255	1.000							
CORR	0.346	-0.141	0.825	-0.329	-0.938	1.000						
GFC	0.048	-0.023	-0.025	0.040	0.005	0.003	1.000					
GOVEFF	0.034	-0.178	0.886	-0.684	-0.795	0.771	-0.013	1.000				
INFL	0.246	0.038	-0.349	0.586	0.073	-0.182	0.161	-0.338	1.000			
NODA	0.348	-0.268	-0.013	0.232	-0.212	0.162	0.059	0.000	0.241	1.000		
OPEN	0.149	-0.342	0.844	-0.627	-0.766	0.781	-0.003	0.918	-0.351	0.049	1.000	
VOICE	0.095	0.025	-0.236	0.430	0.254	-0.332	0.031	-0.266	0.167	0.029	-0.108	1.000

Variables' definition as mentioned in Table 2.

Results of Mediation Role of Information Asymmetry in Association between IFRS and FDI Inflows

In the first step, information asymmetry (mediator variable) need to be significantly associated with IFRS (independent variable). The results are shown in table 7 indicate that information asymmetry is negatively and significantly associated with IFRS at 1 percent level. This result reveal that the level of information asymmetry is improved after IFRS. The findings substantiate few past empirical studies (Naranjo et al. 2013; Turki, Wali and Boujelbene 2016; Abad et al. 2017) that IFRS leads to financial reporting quality improvement, information processing costs reduction, and information asymmetry reduction among capital market participants of each countries. The outcomes also affirm assertion of signaling theory that countries by adopting IFRS are signaling to the world's financial markets that their transparency of financial reports significantly improved and thereby there are less information asymmetry between them and their external parties.

Therefore, the requirement for first step is fulfilled and can proceed with second step. In the second step, FDI inflows need to be significantly associated with IFRS. Table 8 demonstrates the OLS regression analyses results of the second step. As seen in table 8, the relationship between IFRS and FDI inflows is positive and significant at 5 percent level. This outcome suggests that the level of FDI inflows enhance after IFRS. The result supports prior empirical studies (Gordon et al. 2012; Lungu et al. 2017) that IFRS leads to FDI enhancement, and IFRS should be considered as an important determinants of FDI inflows in ASEAN countries. This finding also is consistent with assertion of signaling theory which countries by IFRS signal to other countries and financial market that companies within these countries are now, following generally accepted global accounting standards. The results shown in Table 8 show that the independent variable, IFRS, is associated with dependent variable, FDI inflows, Therefore, the requirement for both first and second steps are fulfilled and can proceed with the final step.

Table 7 Regression result of IFRS and IA, ASEAN 6 (First Step)

		Amihud			BidAsk		
Variable	Predict	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
IFRS	-	-0.479***	-2.882	0.005	-0.020***	-3.793	0
SIZE	-	-0.715*	-1.441	0.104	-0.040**	-2.598	0.011
VOICE	-/+	0.162	0.603	0.548	0.002	0.281	0.779
NODA	-/+	0.003	0.507	0.614	0.000	1.062	0.292
EDU	-	-0.719	-1.397	0.167	0.004	0.239	0.812
INFLATION	+	0.001	0.093	0.927	0.001*	1.765	0.082
GDPCAP	-/+	0.006	1.464	0.561	0.000	0.123	0.902
GFC	+	-0.116	-0.88	0.382	0.003	0.732	0.466
Adj R		0.98			0.75		
F-statistic		74.132			21.112		
Durbin-Watson		1.724			1.12		
N		89			89		

$$IA_{i,t} = \beta_0 + \beta_1 IFRS_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 GDPCAP_{i,t} + \beta_4 Inflation_{i,t} + \beta_5 NODA_{i,t} + \beta_6 VoiceAcc_{i,t} + \beta_7 EDU_{i,t} + \beta_8 GFC_{i,t} + \varepsilon_{i,t}$$

*, **, *** represent significance at the 10, 5 and 1 percent levels, respectively.

Table 8 Regression results of IFRS and FDI inflows, ASEAN 6 (Second Step)

Variable	Predict	Coefficient	t-Statistic	Prob.
IFRS	+	1.033**	2.301	0.024
SIZE	+	3.923***	2.923	0.005
VOICE	+	0.796	1.096	0.277
NODA	+	0.018	1.250	0.215
EDU	+	2.375*	1.706	0.092
INFLATION	-	0.015	1.058	0.130
GDPCAP	+	-0.039	-1.398	0.166
GFC	-	-0.432	-1.218	0.227
Adj R2		0.619		
F-statistic		11.876		
Durbin-Watson		1.386		
N		89		

$$LnFDI_{i,t} = \beta_0 + \beta_1 IFRS_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 GDPCAP_{i,t} + \beta_5 Inflation_{i,t} + \beta_7 Edu_{i,t} + \beta_8 NODA_{i,t} + \beta_9 VoiceAcc_{i,t} + \beta_{12} GFC_{i,t} + \varepsilon_{i,t}$$

*, **, *** represent significance at the 10, 5 and 1 percent levels, respectively.

In third step, information asymmetry as mediator variable should be significantly related with FDI inflows after controlling IFRS. The results are shown in table 9 indicate that after controlling for the effect of IFRS (independent variable), information asymmetry (mediator variable) has significant and negative relationship with FDI inflows (dependent variable). This result reveal that after significant and negative (efficient) effect of IFRS on information asymmetry (which means that IFRS leads to information asymmetry improvement), level of FDI is increased.

This study fulfils the three steps required for mediation analyses based on casual steps approach. The results are consistent with hypothesis of this study that information asymmetry mediates the relationship between IFRS and FDI inflows. To sum up, based on the results of these three steps, there is a positive and significant indirect effect, *a* and *b*, between IFRS and FDI inflows and there is not significant direct effect (*c'*) between IFRS and FDI inflows after controlling for information asymmetry. Therefore, as after finding a significant indirect effect, *a* and *b*, there is no longer a significant direct effect of X on Y, *c'*, this study reports that the information asymmetry perfectly, completely, or fully mediates the association of IFRS and FDI inflows.

Table 9 Regression results of testing mediation role of Information Asymmetry between association of IFRS and FDI inflows, ASEAN 6 (Third Step)

	Amihud			BidAsk		
Variables	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
IFRS	0.682	1.458	0.146	0.631	1.315	0.192
AMIHUD	-0.733**	-2.407	0.018	-2.478**	-2.072	0.041
SIZE	3.398**	2.577	0.012	3.100**	2.26	0.026
VOICE	-0.678	-0.95	0.345	-0.748	-1.051	0.573
NODA	-0.016	-1.145	0.256	-0.014	-1.013	0.314
EDU	1.848	1.352	0.18	2.453*	1.8	0.075
INFLATION	0.086***	2.665	0.009	0.099***	2.977	0.003
GDPCAP	-0.013	-0.439	0.662	-0.037	-1.399	0.166
GFC	-0.517	-1.495	0.139	-0.371	-1.064	0.29
Adj R^2	0.642			0.635		
F-statistic	12.156			11.826		
Durbin-Watson	1.05			1.216		
N	89			89		

$$LnFDI_{i,t} = \beta_0 + \beta_1 IFRS_{\ i,t} + \beta_2 IA_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 GDPCAP_{i,t} + \beta_5 Inflation_{i,t} + \beta_6 Edu_{i,t} + \beta_7 NODA_{i,t} + \beta_8 VoiceAcc_{i,t} + \beta_9 GFC_{i,t} + \varepsilon_{i,t}$$

*, **, *** represent significance at the 10, 5 and 1 percent levels, respectively.

Table 10 shows the summary of the estimated results for the three steps required for mediating test based on 'casual steps' approach developed by Baron and Kenny (1986).

Regarding control variables, Table 9 indicates Size is significantly and positively related to FDI inflows after controlling IFRS effect. This result is also consistent with past studies (Lungu et al. 2017; Sayari et al. 2018) that higher GDP imply better prospects for FDI in the host country. In other side, the researchers found low rate of inflation is a sign of economic stability in the host country and this leads to increase FDI inflows (Andinuur 2013; Alshamsi et al. 2015). However, the results show Inflation has positive and significant relationship with FDI inflows. Increase in FDI inflows leads to increase productivity, and productivity leads to increase inflation.

SUMMARY AND CONCLUSION

The results show that IFRS leads to FDI inflows enhancement, in which also improves the level of information asymmetry throughout ASEAN 6 from 2001 to 2016. Moreover, the regression analyses indicate that information asymmetry fully mediates the association between IFRS and FDI inflows. These findings are consistent with assertion of signaling theory. Countries with adopting IFRS signal to the world that they follow an accepted accounting standard to improve the level of transparency and reduce information- processing costs (information asymmetry) related to FDI. Therefore, this study supports the choice of IFRS implementation for ASEAN countries as a determinant factor of FDI inflows.

There are costs related to implementation of new accounting standards to countries, therefore, the results of this study on effect of IFRS on FDI inflows help policy maker, regulators to understand the benefits that are brought by IFRS. Findings of this study also should be interest of policy maker of countries that have not required IFRS, due to this study provides an empirical document regarding the positive economic consequences of IFRS from the aspects of information asymmetry and FDI inflows.

As with all empirical studies, this study has limitation. There are empirical studies in literature, which examined the determinants of FDI inflows; however, this study was not able to utilize all of those determinants as control variables. Therefore, this study suggest that for future study more control variables are taken into consideration. According to the past studies, information asymmetry is one of the important factor to explain the capital flows. Therefore, this study suggests that future studies examine the relationship between information asymmetry and FDI inflows. To the best of knowledge, there is no study, which examined the relationship between information asymmetry and FDI inflows.

Table 10 Summaries of statistical steps for mediating test based on casual steps approach

Steps	DV	IV	Coefficient	Coefficient value
First Step (Table 7)	IA, Amihud (BidAsk)	IFRS	Indirect effect (*a*)	-0.479*** (-0.020***)
Second Step (Table 8)	FDI inflows	IFRS	Total effect (*c*)	1.033 **
Third Step (Table 9)	FDI inflows	IA, Amihud (BidAsk) and IFRS	Indirect effect (*b*) Direct effect (*c'*)	-0.733** (-2.478**) 0.682 (0.631)

Indirect effect (*a*): The effect of IFRS on information asymmetry (Table 7). Total effect (*c*): The effect of IFRS on FDI inflows (Table 8). Indirect effect (*b*): The effect of information asymmetry on FDI inflows after controlling for IFRS (Table 9). Direct effect (*c'*): The direct effect of IFRS on FDI inflows after controlling for information asymmetry (Table 9).

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