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## Article

# The determinants of dual listing decision of firms from ASEAN-5

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## FINANCIAL ECONOMICS | RESEARCH ARTICLE

# The determinants of dual listing decision of firms from ASEAN-5

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**Abstract:** This study aims to examine the determinants that encouraged firms to have a dual listing. Practically, there is a noticeable lack of empirical evidence, as well as the situation of the ASEAN markets integration which is going against the theoretical debate raises the need for more empirical studies. As a result, the Generalized Method of Moments (GMM) model was applied to assess the strength determinants that driving the listing abroad decision. The empirical findings indicate that firms from countries with higher trade openness and those suffering from higher illiquidity and ownership concentration are more likely to pursue an additional listing. Likewise, the result also shows that firms originated from countries with lower Foreign Direct Investment (FDI) and reputation tend to seek a dual listing. The result shows that firms that are characterized by higher ROA and those from countries with higher GDP are more encouraged to pursue an additional listing. Meanwhile, firms from countries that are characterized with lower market capitalization are more encouraged to have a dual listing. The insignificant results reported for stock volatility and geographic proximity can be interpreted as a result of the improvement in trading technology. In conclusion, the study contributes to the existing body of knowledge by providing empirical evidence about the power of these motivations which encourage firms to have a dual listing. Equally, the results offer evidence for stakeholders, such as investors, and authorities to attain a better understanding of these determinants.

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### PUBLIC INTEREST STATEMENT

The dual listing decision is driven by numerous benefits that motivate firms to offer their shares in foreign exchanges. The segmentation assumption suggests that firms realize the benefits of listing abroad by entering segmented markets. However, the current circumstance of the ASEAN region integration is going against the segmentation notion. The importance of this study is to clarify the impact of market integration as well as the other determinants that affect the dual listing decision. The study employs the GMM model as it is considered a superior technique of estimation as compared to other estimations. The study finding reports a relationship between trade openness, Foreign Direct Investment (FDI), stock liquidity, ownership concentration, and reputation which significantly affect the dual listing decision. This finding provides evidence for stakeholders to attain a better understanding of these determinants.

**Subjects: Quantitative Finance; Statistics for Business, Finance & Economics; International Finance; Corporate Finance**

**Keywords: Dual listing; generalized method of moments**

## 1. Introduction

The act of offering firms' equities in foreign exchange in addition to the local market is known as dual listing. Dual listing is a method of listing firms' equities in a foreign market in addition to their home country listing, in order to raise firms' capital which has seen an increase in the last decades (Caglio et al., 2016). There are two alternatives for listing equities abroad; the first is the cross-listing approach where firms list their shares on a regulated basis and comply with the requirements of the foreign stock exchange (Kipkemoi, 2013). The second approach is by trading in markets that do not require additional obligations i.e. through Depository Receipt (DR)<sup>1</sup> or Over The Counter (OTC) (Ghadhab, 2016; Kariuki, 2015; Makau et al., 2015). Historically, the first firm to be cross-listed in the United States was on 20 December 1928, originating from Canada listed on the New York Stock Exchange (NYSE) (Karolyi, 1997). Hamilton (1979) is the first scholar who developed a theoretical model specifically to study the subject matter. Since then, the subject has been receiving a great deal of attention from researchers (Esqueda, 2017; Ghadhab & Hellara, 2016; Ghadhab & M'rad, 2018).

Firms from developing countries accepted listing abroad to overcome the high transaction and capital costs, high risks, poor governance, and information asymmetry in their home market. Listing in major markets found enables firms from developing countries to enhance their growth opportunity and overcome these obstacles (Ghadhab & M'rad, 2018; Singh, 2009; You et al., 2013). Moreover, firms are found to engage in an overseas listing to enhance their information disclosure, compete with other investors, and attain wider financial innovation for local and foreign investors (Kipkemoi, 2013; Makau et al., 2015; Wanjiru, 2013). Firms also aim to increase their equity capital, operations, financial performance, and firm value through an overseas listing. Meanwhile, investors are encouraged to add foreign securities to diversify their portfolios (Bahlous, 2013; Cheronno, 2010; Karolyi, 2006; Ndirangu & Iraya, 2016; Zhou & Owusu-Ansah, 2014).

Previously, numerous theories were used to explain the impact of dual listing such as market segmentation (Cheronno, 2015; Fernandes & Giannetti, 2014), legal bonding theory (Ghadhab & M'rad, 2018; Huang et al., 2016), and liquidity theory (Ball et al., 2018). The current situation of the integration and alliances between markets is found to facilitate firms in reaching foreign investors as well as increase capital flows between different markets, which is expected to decrease the firms' preference to list in other host markets (Chouinard & D'Souza, 2004; Mu, 2014). This situation particularly in the Associated South East Asian Nation (hereafter known as ASEAN) markets renders the expected benefits from dual listing to disappear or at least reduced (Cavoli et al., 2011). Based on the above-mentioned theories, there is a lack of studies that use the global business strategy approach to explain the dual listing phenomena, which is suggested that firms are encouraged to seek a dual listing as part of their globalization strategy (Ghadhab & M'rad, 2018). Thus, the use of this theory in the current study to investigate the determinants will provide a reliable explanation in addressing the issue of the motivations that encourage firms to pursue a dual listing.

Empirically, earlier scholars had focused on examining the effect of dual listing based on different factors such as stock liquidity, stock volatility, firms' visibility, ownership concentration, and geographic proximity (Al-shamahi et al., 2017; Amiram et al., 2015; Ghadhab & Hellara, 2016). To date, the determinants that encourage firms to have a dual listing have received scant attention in the research literature. Moreover, numerous models and methodologies have been used to examine dual listing, especially the GARCH model, Copula model, and factor models (Karolyi, 2006). The regression models such as multivariate regression, multiple regression,

univariate analysis, logistic regressions, and Merton's model have been used widely (see for example, Dodd et al., 2015; Doidge et al., 2009; O'Connor & Connor, 2009). Fewer who use the GMM model to evaluate the dual listing determinants (see e.g. Bayar & Önder, 2005; Bianconi & Chen, 2009; Domowitz et al., 1998; Review & Jayakumar, 2002; Serra, 1999; Yang & Lau, 2005). GMM model is intended to solve the issues of unobserved heterogeneity, endogeneity, autocorrelation, and non-normality that cannot be solved by fixed-effect or OLS, which is expected to result in contradictory and biased estimates (Arellano & Bond, 1991; Bond, 2002; Bond et al., 2001). Therefore, this study suggested using the GMM model to provide robust evidence to address the subject of the dual listing determinants.

To sum up, this study aims to evaluate the determinants focuses on market integration, stock liquidity, stock volatility, ownership concentration, reputation, and geographical proximity that driven the firms' dual listing decision. This is to answer the question regarding the above-mentioned determinants that motivate firms to pursue a dual listing. The finding of the study is expected to provide evidence of the hypothesis in a combination that there is a relationship between the above-stated determinants and the dual listing decision. Furthermore, this study fills the gap regarding the use of the GMM models which is expected to provide empirical evidence about the subject matter that will help in overcoming the restrictions and issues prevalent in other statistical models. The use of the GMM, as well as the concentrates on firms that originated from ASEAN that examine market integration, makes the current study different from the previous studies. The robust and superior estimation of the GMM technique will contribute to the existing body of knowledge about the strength of the determinants that motivate firms to seek a dual listing (Majid et al., 2008).

The structure of the remaining of this paper is as follows: Section 2 presents the literature on the dual listing subject regarding the determinants that affect the dual listing decision. The methodology of the study is shown in Section 3 which includes a description of the diagnostic tests used in this study in Section 3.1 contains normality, multicollinearity, and homoscedasticity testes. Analysis and discussion reported in Section 4 started with sample description in Section 4.1. This is followed by the results of diagnostic tests for normality, multicollinearity, homoscedasticity, and auto-correlation in Subsections 4.2, 4.3, 4.4, and 4.5, respectively. Section 4.6 presents the GMM analysis and discussion of the results. Lastly, the conclusion of the finding is summarized in Section 5.

## 2. Literature review

Hundreds of companies worldwide had been encouraged to cross-list their shares in the 1980s and 1990, due to the removal of barriers and relaxation of the restrictions on investment movements (Dobbs & Goedhart, 2008; Ndirangu & Iraya, 2016; Yao et al., 2018). The increase of firms pursues dual listing increase number of question regarding the motivation that encourages them to take this decision (Duppati et al., 2017). The benefits realized from listing abroad encourage firms to pursue dual listing to reduce trading and capital costs, increase investor recognition, and widen the financial sources of firms by offering their securities in more than one market (Dobbs & Goedhart, 2008; Ghadhab & M'rad, 2018; Roosenboom et al., 2009; You et al., 2013). The dual listing enlarges the firms' investors base; helps them overcome the lack of liquidity; improves stock liquidity, stock price informativeness, visibility, investor protection; decreases the cost of capital, and increases the firms' value (Bahlous, 2013; Ghadhab & M'rad, 2018; Kariuki, 2015; Mu, 2014). This is in turn expected to improve firms' growth opportunities compared to their counterparts and encourage investors to add new foreign securities to their portfolio.

Currently, countries around the world are forming alliances to overcome the barriers of capital movement, which is found to enhance the competition among investors and market makers, as well as provide wider financial innovations to the investors in their home country (Kariuki, 2015; Kipkemoi, 2013; Makau et al., 2015; Wanjiru, 2013). The integration of capital markets enhances the

competition between stock markets and investors in trading in foreign securities (Kariuki, 2015; Yao et al., 2018). The integration of capital markets goes against the segmentation theory assumption. This theory suggests that firms realized benefit from entering a segmented market, however, the current circumstance renders the expected benefits to be uneconomical as capital markets become more integrated and investors more global (Dobbs & Goedhart, 2008; Kariuki, 2015).

ASEAN has taken a series of steps to ensure the integration of their financial markets such as creating the ASEAN Common Exchange (ACE) and the ASEAN Comprehensive Investment Agreement (ACIA) to simplify the capital flow between their members (ASEAN, 2015, 2017; Jantarakolica & Sakayachiwakit, 2015). Moreover, the ASEAN Capital Markets Forum (ACMF) was founded to facilitate the investment movement within the region (Moon & Peery, 2008; Wan, 2017). Despite the measures taken by ASEAN to become more attractive worldwide, however, they are found to remain unattractive within each other (ASEAN, 2015; Koowattanatianchai & Prayarach, 2016). Nevertheless, there is a lack of studies that evaluate the extent to which market integration encourages firms to pursue a dual listing.

Moreover, previous studies show that stock liquidity plays an important role in enhancing the firms' ability to raise their capital efficiently and attract foreign investors who aim to add foreign securities to their portfolio (Berkman & Nguyen, 2010; Do et al., 2016; Moffett et al., 2014; Sarkissian & Schill, 2016). It is found that firms with high stock liquidity are more likely to realize a reduction in issuing and trading fees after cross-listing (Aluoch, 2012; Mu, 2014). ASEAN countries were found suffering from illiquidity, thus, firms from these countries seek a dual listing in major markets such as the US and Europe that are characterized by high liquidity. This is found to enhance their stock liquidity and facilitates the offering of the firms' stocks and reducing their costs (Al-Jaifi, 2017; Bayar & Önder, 2005; Karolyi, 2006; Roosenboom et al., 2009). Past studies had examined the impact of dual listing on stock liquidity, but very few had examined whether firms with low stock liquidity are motivated to pursue a dual listing abroad.

Besides that, scholars have also shown that the volatility in stock prices leads to abnormal returns as a result of high risks, which are affected by the standards, scrutiny, and disclosures required in the stock markets where the firms had listed their equities (Amiram et al., 2015; Ndirangu & Iraya, 2016). Listing in major exchanges such as the US is found to decrease stock price volatility because of the widening of investors' base and trading activities (Amiram et al., 2015; Bahlous, 2013; Jain & Strobl, 2016). However, the reduction in the stock volatility did not always occur; for example, the Gulf Cooperation Council Countries were found to suffer from an increase in abnormal returns (Bahlous, 2013). ASEAN countries such as Malaysia, the Philippines, and Singapore suffered from high volatility due to low trading volumes (Wang, 2013). The above-mentioned studies showed that scholars study the effect of stock volatility. The current study is differed from previous studies as it aims to evaluate to what extent firms with high stock volatility are encouraged to have a dual listing to reduce their stock volatility.

Furthermore, cross-listing is found to reduce the firms' control shareholders as a result of the widening of their investors base when listing overseas (Al-shamahi et al., 2017). The minority rights are found expropriated by the controlling ownership as they have a considerable ability to control other stakeholders (Alhebrri & Al-Duais, 2020; Ghaleb et al., 2020). Studies have shown that firms originating from emerging markets characterized by weak governance suffer from ownership concentration (Moffett et al., 2014). For example, two-thirds of firms in Hong Kong, Malaysia, Singapore, Thailand, and Indonesia have high ownership concentrations (Aguilera & Crespi-Cladera, 2016; Carney & Child, 2013; Oehmichen, 2017). Firms from countries with poor investor protection and minority rights are found to experience a reduction in control shareholder by listing in high standard markets such as the US and UK exchanges as firms enhance investor attractiveness and confidence which in

turn changes their ownership structure (Al-Jaifi, 2017; Al-shamahi et al., 2017; Ayyagari & Doidge, 2010). While firms are found to experience changes in their ownership structure, there is a lack of studies that examine whether firms with higher ownership concentration are more likely or motivated to pursue a dual listing in foreign markets. Therefore, this study pursues to evaluate whether firms suffering ownership concentration seek listing abroad to reduce the control of ownership.

Likewise, firms opt to have a dual listing to enhance their prestige or reputation which provides valuable outcomes for existing and potential stakeholders (Makau et al., 2015). Studies have shown that investors are aware of firms' reputations and they consider it an important factor in their investment decision (Burns et al., 2007). The bonding theory suggests that firms bond themselves to major markets such as the US market to enhance their reputation, improve their attractiveness and visibility to potential investors and customers, as well as to stand out from their counterparts (Karolyi, 2006; Shen et al., 2010; Siegel, 2005; Walker, 2010). It is found that free advertisement by the host market media in foreign countries plays an important role in enhancing the visibility of firms among investors. Despite the expected improvement in the firms' visibility due to entering the new stock exchange, the evaluation of the firms' reputation still needs more examination especially in the case of dual listing because of the lack of measures to evaluate the enhancement in the firms' reputation in such a situation (Walker, 2010). Previous studies had demonstrated a lack of measures for evaluating the firms' reputation especially in the case of foreign listing. Therefore, this study suggests using the growth of outstanding shares owned by foreign investors as a proxy in evaluating the improvement in the firms' reputation after cross-listing.

Previously, the distance between the home and host markets is found to play a crucial role in influencing capital movement (Ghadhab, 2016; Sarkissian & Schill, 2004). The closeness between the home and host markets in terms of distance, culture, and language is found to provide an advantage for investors as they are more able to trade in foreign securities (Dodd, 2013). The global business strategy approach suggests that firms are expected to be motivated to extend their activities to closer destinations when going international; this is expected to attract more investors and improve the gains that they could realize (Kipkemoi, 2013). However, the current circumstances of development in electronic platforms used in trading activities are expected to change the impact of closeness when choosing the destination.

Electronic platforms are found to increase the competition among markets in attracting trading activities as well as affecting the impact of geographical proximity in motivating firms to have a dual listing (Wang & Zhou, 2015). This is evident in ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, and Thailand) (hereafter ASEAN-5) as presented in the data description whereby more than 90% of the samples have chosen to pursue a dual listing outside of the Asian region. However, there is a lack of studies evaluating the firms' distance choice preferences when pursuing a dual listing.

In conclusion, several gaps have been highlights in the previous literature. Previously, scholars gave a great deal of attention to study the impact of having a dual listing. However, with the exception of Dodd et al. (2015) and Koh et al. (2013), there is a notable lack of studies that study the determinants of the dual listing. Further, this paper focuses on firms with dual listing that originated from the ASEAN region which experience market integration. However, few empirical studies considered the integration of the capital market when study why firms are still preferring to list abroad in other markets. In the nutshell, since few studies attempt to examine the determinants of the abovementioned factors this study aims to evaluate the extent of these determinants to play a crucial role to encourage firms to have a listing abroad.

### 3. Methodology and data analysis

This study suggests the usage of the generalized method of moments (GMM), which is widely used for the analysis of economic and financial data (Hall, 2005; Zsohar, 2012). The estimation using this model can achieve reliable and unbiased result even when endogeneity exist in the model (Nyeadi et al., 2018). Furthermore, it is considered as a more superior and robust estimation technique as compared to other estimations as it provides a unified framework and a quantifiable method for estimation apart from requiring no normality distribution assumptions (Majid et al., 2008). The GMM model has the primary features of:

- (1) The ability to remove serial correlations.
- (2) The ability to remove heteroscedasticity.
- (3) The ability to address the problem of endogeneity.
- (4) Being applicable for time series and cross-sectional data.
- (5) Being more efficient in the presence of heteroscedasticity and the case of no heteroscedasticity, it is no worse than instrumental variable estimators (Abdulganiyy, 2018; Roodman, 2009).

Despite the above-mentioned robustness of the GMM model, it argued that a panel with a small Time ( $T$ ) may lead to unexpected estimation. This is because the small  $T$  makes the estimator inefficient especially when the instruments used in the model are weak (Arellano & Bover, 1995). However, this study presents a large  $T = 15$ , which is large and sufficient to bypass such problems. The GMM model requires some examinations before being implemented; for instance, the main assumptions of normality, multicollinearity, homoscedasticity, and autocorrelation need to be tested first to verify their validity to be included in the study (Al-Yousfi, 2017; Wang & Zhou, 2015).

According to Al-Yousfi (2017) and Majid et al. (2008), the lags of explanatory variables are used as the instrumental variables because of the difficulty in finding other instrument variables. It is found that using lagged values of dependent and independent variables makes more sense in the context of models estimated under rational expectations. This study aims to examine the determinants (market integration, stock liquidity, stock volatility, ownership concentration, reputation, and geography proximity) of the dual listing decision of firms from ASEAN-5 countries. The foreign listing yearly growth is the dependent variable used to evaluate the decision of firms to pursue a dual listing and for obviating those that do not as the study uses a dynamic model that required continuous dependent variable. This renders the use of the dependent variable as a dummy variable inappropriate for this study. Therefore, the equation will be as follows:

$$\text{FLYG}_{it} = \theta_0 + \theta_1 \text{LFLYG}_{it-1} + \theta_2 \text{TR}_{it} + \theta_3 \text{FDI}_{it} + \theta_4 \text{ILLIQ}_{it} + \theta_5 \text{VOLT}_{it} + \theta_6 \text{OC}_{it} + \theta_7 \text{Rep}_{it} + \theta_8 \text{Geog\_Prox}_{it} + \theta_9 \text{ROA}_{it} + \theta_{10} \text{MC}_{it} + \theta_{11} \text{GDP}_{it} + \varepsilon_{it}$$

Where:

$\text{FLYG}_{it}$  = foreign listing yearly growth for firms having a dual listing.

$\text{LFLYG}_{it-1}$  = Lagged of foreign listing yearly growth.

$\text{TR}_{it}$  = Trade openness defined as imports plus exports for each country divided by its GDP for the country  $i$  in time  $t$ .

$\text{FDI}_{it}$  = FDI openness defined as the flow of inward FDI scaled by GDP for the country  $i$  in time  $t$ .

$\text{ILLIQ}_{it}$  = Stock Illiquidity for the company  $i$  in time  $t$ .



$VOLT_{it}$  = Stock volatility for the company  $i$  in time  $t$ .

$OC_{it}$  = Ownership concentration for the company  $i$  in time  $t$ .

$Rep_{it}$  = Reputation for the company  $i$  in time  $t-1$ .

$Geog\_Prox_{.it}$  = Geographical proximity for the company  $i$  in time  $t$ .

$ROA_{it}$  = Return on Assets for the company  $i$  in time  $t$ .

$MC_{it}$  = Market Capitalization of country  $i$  in year  $t$ .

$GDP_{it}$  = Gross Domestic Production of country  $i$  in year  $t$ .

### 3.1. Diagnostic tests

There are several tests needed to be run before the execution of regression analysis namely normality, multicollinearity, homoscedasticity, and autocorrelation tests. These tests are considered necessary to be tested to confirm the validity of the variables in the study (Hair et al., 2014). Gujarati and Porter (2009); and Wooldridge (2013) argue that in regression context these tests needed to prove the linear function, the minimum variance, and the expected value is a true value which is known as the Best Linear Unbiased Estimator (BLUE).

#### 3.1.1. Normality test

The degree of the normal distribution of a sample is known as the Normality test which allows us to examine the probability of the distributions of the variables' coefficients and their variances (Gujarati & Porter, 2009). Hair et al. (2014) define normality as the degree to which the distribution of the sample data corresponds to a normal distribution. This study using Shapiro–Wilk test (Shapiro & Wilk, 1965) and Shapiro–Francia (Shapiro & Francia, 1972) test to confirm the normality of the data in this study. The former may have some limitations with the large sample size therefore the latter was developed to overcome it. The Swilk command is used to performs the Shapiro–Wilk test, whereas the sfrancia command is used to performs the Shapiro–Francia test in STATA (Hilbe & Anagnoson, 1991).

#### 3.1.2. Multicollinearity test

The association between many independent variables is primarily calculated by the multicollinearity test. There are two tests suggested examining multicollinearity, which are the tolerance statistics and the variance inflation factor (VIF) in order to verify the presence of multicollinearity in a model. Tolerance is an indication of how much of the variance of the independent identified is not described in the model by the other independent variables, where it is valued should be less than 0.10. VIF is only the reverse of the value of tolerance (Hair et al., 2014; Pallant, 2011). For testing the multicollinearity problem, the correlation coefficient of variables is also used. It indicates the existence of multicollinearity when the correlation coefficient is high. There appears, however, to be no compromise about how large multicollinearity should be to show the coefficient. The multicollinearity problem exists if the coefficients of the independent variables are higher than 0.90 (Gujarati & Porter, 2009; Midi et al., 2010; Pallant, 2011).

#### 3.1.3. Homoscedasticity/heteroscedasticity analysis

Homoscedasticity is the variance of the residuals about predicted dependent variable scores that should be the same for all predicted scores (Pallant, 2011). Homoscedasticity is one of the important assumptions of the classical linear regression model, which assumes equal error variance (Hickey et al., 2019). Data is said to be homoscedastic when the variance of error terms

appears constant over a number of independent variables. Heteroscedasticity, on the other hand, display the distortion that occurs when the error term indicates no variance similarity in the regression analysis. illustrates the bias that occurs in a regression analysis where no variance similarity is demonstrated by the error term (Hair et al., 2014). A fundamental regression model requires that the error term in the regression function is homoscedastic or equal variance over all periods and locations. There is a homoscedastic problem if the variance is not equal or constant. The problem of heteroscedasticity can be evaluated using the Breuch-Pagan Godfrey Test, and the White General Heteroscedasticity Test which is expected to be solved by using the method of GMM model (Gujarati, 2004; Hair et al., 2014; Wooldridge, 2013).

#### 3.1.4. Autocorrelation

Autocorrelation may be defined as “correlation between members of series of observations ordered in time, or space”. In regression analysis, the classical linear regression model assumes that such autocorrelation does not exist in the disturbances  $u_i$  (Gujarati, 2004). Following Al-Yousfi (2017) Arellano-Bond test for autocorrelation is applied to test the null hypothesis of no autocorrelation to the differenced residuals. Gujarati and Porter (2009); and Wooldridge (2013) argue that first- order autocorrelation, AR(1), and second-order serial correlation, AR(2), are the most common procedures and used to solve autocorrelation problems before a regression analysis can be tested. The existence of AR(2) would cause the GMM estimator to be inconsistent, which is the most significant test. As a result, the result for AR(2) does not reject the null hypothesis in order to maintain the accuracy of the GMM estimator (2017).

In summary, the GMM model have been applied in this study to deal with issues of endogeneity and overidentifying restrictions that will be invalid if heteroskedasticity is present. The GMM used as it solves the issue of serial correlations, endogeneity, and heteroscedasticity (Arellano & Bond, 1991; Bond, 2002; Bond et al., 2001; Abdulganiyy, 2018; Roodman, 2009). Recently, the GMM considered the usual approach applied when facing heteroskedasticity problems which allow for efficient estimation (Baum et al., 2003). Furthermore, the AR(2) test is an important examination to confirms the reliability and validity of the GMM estimator.

## 4. Analysis and discussion

### 4.1. Sample description and sample statistics

This section explains the characteristics of the data used in the study. The ASEAN is initially formed by five countries, followed by other five countries that join to make up by ten countries. To date, however, the ASEAN exchange only consists of six countries namely Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam (ASEAN, 2013; Jantarakolica & Sakayachiwakit, 2015). This study only considers five ASEAN countries namely (Indonesia, Malaysia, the Philippines, Singapore, and Thailand). Vietnam is excluded as a result of the lack and insufficient data for the research purpose (Jantarakolica & Sakayachiwakit, 2015). The ASEAN-5 countries were selected as they are the first countries that initially formed the ASEAN as well as they found highly integrated among themselves and worldwide (Karim & Karim, 2012; Nikmanesh, 2016). In line with this study objective to evaluate the dual listing determinants, especially the integration which is considered as an important determinant on the listing abroad decision. The sample of the study consists of firms from ASEAN-5 countries that have a dual listing from 2003<sup>2</sup> to 2017. This period was selected because ASEAN takes several steps to ensure the integration that facilitates the listing requirement within the ASEAN markets (ASEAN, 2003, 2011). This makes this study differ from previous studies that choose a period around the dual listing date, as they examine the effect of the dual listing for example, in sensitivity of stock price, return, firms value, an visibility around the listing date (see e.g. Baker et al., 2002; Clarkson et al., 2018; Foucault & Frésard, 2012; Kipkemoi, 2013; Lee & Valero, 2010).

The data are collected from the Thomson Reuters Eikon, Datastream, and World Bank for firms that have a dual listing in addition to their home country. So, panel data of firms with a dual listing of fifteen years will be examined using the GMM model. The study excludes those firms that have the first listing outside their home market as the study aims to examine the determinants of firms to pursue additional listing outside their home country. Furthermore, the study excludes five firms that exit from the foreign markets within the study period. The summary of the firms included in this study are those with a dual listing reported in [Table 1](#) depends on the country of origin.

[Table 1](#) presents the number of firms from ASEAN-5 countries that have a dual listing in the foreign market in addition to their home market. Firms that have a dual listing from Indonesia, Malaysia, Philippines, Singapore, and Thailand are 186, 41, 40, 282, and 109 firms, respectively. The table showed 506 firms' preference to have a dual listing in European markets, whereas 140 firms listed their and US markets, and only 12 firms show to list in Asia and other markets.

[Table 2](#) reports the mean, the minimum, and the maximum of the complete sample. The mean of the dependent variable for the FLYG indicates that the yearly foreign listing growth is 43% which represents an increase in firms that prefer to pursue a dual listing. With regards to the independent variables, the study uses two proxies for market integration. The trade openness showed a mean of 211% which indicates that these firms originated from countries that experience higher growth in trade openness. The means of the second proxy of market integration is Foreign Direct Investment (FDI) openness reported around 10% which denotes the foreign investors' participation in domestic production. The mean of the illiquidity is 0.8% which represents the daily price response associated with one dollar of the trading volume. The mean of the stock volatility is 47% which represents high stock price volatility denoting a higher level of uncertainty about the fundamental values of the stock.

The mean percentage of the top three ownerships is around 45%, which shows that ASEAN-5 firms suffer from ownership concentration by family, government, or even individual. The mean of reputation is 16.58% which indicates the mean for outstanding shares owned by foreign investors, which is a good indicator of the increase of the visibility of the firms to the foreign investors. The mean distance of the host market is 10,892 km, which denotes that ASEAN-5 firms prefer to have a dual listing outside their region in distant foreign markets as shown in the data namely the US and Germany. Regarding the control variables, the mean of ROA of firms from the ASEAN-5 reported in [Table 2](#) is 5.9%, which indicates that in general, each USD invested in the assets will generate around 6% in returns. The descriptive statistic of market capitalization and GDP are purposely stated as integer values, so as to reflect the actual market capitalization and GDP of the home country. However, they are transformed into log form in the GMM analysis (Ismail et al.,

**Table 1. Sample of the study**

Country	Total firms listing abroad	Destination Asia	Destination The US	Destination Europe
Indonesia	186	0	7	179
Malaysia	41	3	38	0
Philippines	40	0	40	0
Singapore	282	8	46	228
Thailand	109	1	9	99
Total	658	12	140	506

Source: Data collection.

**Table 2. Descriptive statistics of variables**

Variable		Mean	Min	Max	Observations
FLYG	overall	0.4332367	0	5	N = 9870
	between		0.1506333	0.5443933	n = 658
	Within		-0.1111566	4.943397	T = 15
TR	overall	2.110353	0.3742	4.3733	N = 9870
	between		0.50322	3.741087	n = 658
	Within		1.414066	2.742567	T = 15
FDI	overall	0.0978246	-0.0025	0.2802	N = 9870
	between		0.0153733	0.1989667	n = 658
	within		-0.038142	0.179058	T = 15
ILLIQ	overall	0.0080589	0	1.4317	N = 7655
	between		0	0.2696545	n = 657
	within		-0.2611957	1.245432	T-bar = 11.651
VOLT	overall	0.4715732	0	10.2713	N = 8347
	between		0.11676	3.000127	n = 657
	within		-1.323054	9.781993	T-bar = 12.704
OC	overall	0.4500664	0	42.7229	N = 6705
	between		0.00008	6.277327	n = 556
	within		-5.81416	36.89564	T-bar = 12.059
Rep.	overall	0.1658583	0	2.5302	N = 6576
	between		0	1.4601	n = 543
	within		-0.6333684	1.295122	T-bar = 12.110
Geog_Prox.	overall	10,892.38	315.07	16,356.59	N = 9720
	between		315.07	16,356.59	n = 648
	within		10,892.38	10,892.38	T = 15
ROA	Overall	0.0590566	-51.0312	4.2907	N = 8441
	between		-3.44098	0.7318133	n = 645
	Within		-47.53116	4.14663	T-bar = 13.086
MC	Overall	376,594.7	23,176	787,255	N = 9870
	between		146,699.1	524,565.5	n = 658
	Within		532.1854	656,923.9	T = 15
GDP	Overall	363,576.7	83,908	1,015,423	N = 9870
	between		202,266.1	653,433.4	n = 658
	Within		-55,084.7	725,566.3	T = 15

Note: FLYG = foreign listing yearly growth, TR = Trade openness, FDI = foreign direct investment openness, ILLIQ = Illiquidity, VOLT = Volatility, OC = ownership concentration, Rep. = Reputation, Geog\_Prox. = Geography proximity, ROA = Return on Assets, MC = Market Capitalization in millions of USD, GDP = Gross Domestic Production in millions of USD. Following previous studies, the log of MC and GDP have been used in the model regression (Zhou & Owusu-Ansah, 2014).

2018). The mean market capitalization and the GDP are USD376,594 and UDS363,576, respectively, which is a good indication of the growth experienced by the ASEAN-5 countries.

Table 3 reports the mean sorted by the home of origin. The mean of the DLYG reveals that Indonesia experiences the highest growth with 54%, whereas the Philippines showed a growth of

**Table 3. The mean of the sample based on country of origin**

	Indonesia	Malaysia	Philippines	Singapore	Thailand
Variable	Mean	Mean	Mean	Mean	Mean
FLYG	0.5444	0.4898	0.1506	0.4346	0.3224
TR	0.5032	1.6550	0.7678	3.7411	1.2978
FDI	0.0173	0.0344	0.0154	0.1990	0.0277
ILLIQ	0.0055	0.0012	0.0012	0.0169	0.0001
VOLT	0.4813	0.2654	0.4135	0.5450	0.3820
OC	0.5694	0.4956	0.5507	0.5143	0.0430
Rep.	0.2277	0.1617	0.1278	0.1815	0.0429
Geog_Prox.	11013.18	11317.62	11554.73	10957.50	10089.92
ROA	0.0835	0.1118	0.0793	0.0210	0.0864
MC	274724.20	332741.00	146699.00	524565.50	268465.80
GDP	653433.40	240309.60	202266.00	230598.60	318557.90

15% of firms pursuing a dual listing. Singapore, which is one of the main financial centers represents 374% mean, on the other hand, Indonesia reported a lower trade openness with a 50% mean, the high mean indicates high integration with the other world markets. Table 3 reports the lower of 1.5% mean for FDI of the Philippines, meanwhile, Singapore recorded the highest mean of 19.9% which indicate the openness of the Singapore capital market. Indonesia represents the highest firms' stock illiquidity with 0.55%, whereas Thailand reported the lowest illiquidity between the ASEAN-5 countries. Meanwhile, Singapore and Indonesia showed the highest stock volatility of 54% and 48%, respectively, denoting a higher level of uncertainty about the fundamental values of their stocks.

Firms originated from Indonesia found to suffer from high ownership concentration with 56% mean of the top three ownership, followed by the Philippines, Singapore, and Malaysia with 55%, 51%, and 49%, respectively. Thailand shows the lowest ownership concentration among the ASEAN-5 countries with a mean of around 5% only. A reputation which measured by the improvement of the outstanding shares owned by foreign investors showed that Indonesian firms experience the highest percentage of outstanding shares owned by foreign investors 22%, followed by Singaporean firms with 18%, then Malaysian 16%, and Philippines 12%, while Thailand firms present the lowest ratio of 4%. In general, the distance between the host and the home markets is between 10,892 kKm to 11554.73, which denotes that ASEAN-5 firms prefer to have a dual listing far away from their region, shown firms prefer to have a dual listing in the US and European markets. In regard to the control variable, Malaysian firms with a high ROA seek a dual listing, meanwhile Singaporean firms that pursue dual listing are the lower ROA. The Philippines showed lower market capitalization and GDP between the ASEAN-5 countries.

Tables 4 and 5 report the distribution of the sample based on sectors and depend on the dual listing destination and home country. Industrial firms are found the most likely firms that have dual listing, whereas 20% of the sample from this sector, where more than 50% of them from Singapore. Consumer discretionary firms are the second order with around 14% sector that firms are preferring to pursue dual listing. Firms from real estate, consumer staples, and financials sectors are from those seeking additional listing 11.25%, 10.33%, and 10.18%, respectively, from the study sample. Singaporean firms represent more than half of the real state sector, while Indonesian firms represent around 40% of the consumer and financial sectors. Basic material, energy, and Telecommunications are representing 8.81%, 8.66%, and 5.47% of the study sample. A 3.95% of the sample of firms from Technology and utilities for each sector. Firms from the health care sector are the lowest firms from the ASEAN-5 seeking a dual listing.

**Table 4. Distribution of firms based on destination and sectors**

	Basic Materials	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrial	Real Estate	Technology	Telecommunications	Utilities	total by destination
Asia & others	3	0	2	0	0	2	1	2	1	0	1	12
Europe	47	68	52	49	52	13	110	55	21	26	13	506
US	8	24	14	8	15	7	21	17	4	10	12	140
total by sector	58	92	68	57	67	22	132	74	26	36	26	658

**Table 5. Distribution of firms based on home country and sectors**

	Basic Materials	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrial	Real Estate	Technology	Telecommunications	Utilities	total by country
Indonesia	18	25	27	21	28	6	30	17	2	9	3	186
Malaysia	2	7	3	4	6	3	4	2	1	4	5	41
Philippi	5	6	6	3	5	0	5	3		2	5	40
Singapore	25	33	25	21	13	10	75	43	18	10	9	282
Thailand	8	21	7	8	15	3	18	9	5	11	4	109
total by sector	58	92	68	57	67	22	132	74	26	36	26	658

#### 4.2. Normality test

Normality is the assumption that is used to examine the normality distribution of the sample. It assumes that if the  $p$ -value of the variable is more than 0.05 ( $p$ -value > 0.05), the result is not significant, and the distribution is normal. In other words, if the  $p$ -value of the variable is less than 0.05 ( $p$ -value < 0.05), the results are significant and the distribution of the data is not normal (Al-Yousfi, 2017; Gould et al., 2016; Hair et al., 2014).

Table 6 reports the results of the test for normality which show that the  $p$ -values of the dependent and independent variables are less than 0.05, indicating that the variables significantly follow a non-normal distribution. However, the non-normality in the sample should not cause any major problems because the large sample ( $N > 100$  observation) might not affect the results of the regression where the sample of this study is very large where  $N$  equals to at least 6,576 (Al-Yousfi, 2017; Gould et al., 2016; Hair et al., 2014).

Besides that, the normality test checks for outlier values using skewness and kurtosis tests which suggest that the absolute values of the skewness and kurtosis should not exceed 3 and 10, respectively. If the variables' absolute value is greater than 3, then they are described as extremely skewed; if the variables' kurtosis value is greater than 10, then they are described to have extreme kurtosis (Almeida et al., 2016; Al-Yousfi, 2017).

Table 7 presents the result of the skewness and kurtosis test of the foreign listing's yearly growth, trade openness, FDI openness, illiquidity, volatility, ownership concentration, reputation, ROA, market capitalization, and GDP. The result reports that FLYG, illiquidity, volatility, ownership concentration and ROA suffer from outlier issues. Previous studies pointed out that the skewness and kurtosis values should be lower than 3 and 10, respectively (Almeida et al., 2016; Keefe & Yaghoubi, 2016; Pardisa et al., 2017; Theelen, 2016). In order to solve the outlier's values, the variables of FLYG and illiquidity are winsorized at 5% while volatility, ownership concentration, and ROA are winsorized at 1%. The values after treatment are presented in Table 7.

Table 6. Shapiro–Wilk and Shapiro–Francia tests for normality					
	Shapiro-Wilk $W$ test for normal data		Shapiro-Francia $W'$ test for normal data		
	Obs	$W$	Prob> $z$	$W'$	Prob> $z$
FLYG	9,870	0.50083	0.0000	0.50124	0.0000
TR	9,870	0.8425	0.0000	0.84252	0.0000
FDI	9,870	0.81209	0.0000	0.81209	0.0000
ILLIQ	7,655	0.27282	0.0000	0.27298	0.0000
VOLT	8,347	0.60896	0.0000	0.60855	0.0000
OC	6,705	0.1865	0.0000	0.18504	0.0000
Rep.	6,576	0.73835	0.0000	0.73987	0.0000
Geog_Prox.	9,720	0.87658	0.0000	0.87678	0.0000
ROA	8,441	0.07762	0.0000	0.0763	0.0000
MC	9,870	0.9436	0.0000	0.9439	0.0000
GDP	9,870	0.9601	0.0000	0.9600	0.0000

**Table 7. Skewness/kurtosis tests for normality**

Variable	Before Winsorized		After Winsorized		% of winsorized
	Skewness	Kurtosis	Skewness	Kurtosis	
FLYG	3.4730	14.9224	2.8620	10.5117	5%
TR	0.2210	1.3121			
FDI	0.5900	1.6416			
ILLQI	14.5675	357.5448	2.7999	9.6000	5%
VOLT	6.7298	98.8274	1.0254	3.3386	1%
OC	44.1885	2329.2940	-0.1541	1.7480	1%
Rep.	2.0634	8.5718			
Geog- Prox.	0.1571	4.9330			
ROA	-66.2079	5193.7820	0.2381	2.9674	1%
MC	-0.8128	3.1321			
GDP	0.2928	2.6006			

### 4.3. Multicollinearity analysis

Multicollinearity is an examination of the correlation matrix for the independent variables which have two measures namely variance inflation factor (VIF) and tolerance. The higher degrees of multicollinearity are reflected in lower tolerance values and higher VIF values (Hair et al., 2014). Thus, the regression model suffers from multicollinearity problems when the values of VIF are higher than 10 or the values of Tolerance are less than 0.10 (Al-Yousfi, 2017; Hair et al., 2014).

Table 8 presents the Multicollinearity Diagnostic result for the variables included in the analysis which shows that there is no evidence of multicollinearity problem among the variables of this study. All the VIF values of the study variables are less than 10, specifically between 1.02 and 8.74. The tolerance result is more than 0.10, specifically between 0.165739 and 0.982549, which confirm that the model does not suffer from multicollinearity among the study variables.

Pallant (2011) suggested using the correlation analysis as an additional test to examine the multicollinearity between independent variables, the multicollinearity is expected to affect the relationship between independent variables with the dependent variable. The correlation between

**Table 8. Multicollinearity diagnostic test**

Variable	VIF	1/VIF
Trade openness	8.74	0.114459
MC	6.07	0.16467
GDP	5.03	0.198613
FDI	4.63	0.216015
VOLT	1.7	0.588203
ILLIQ	1.7	0.589138
OC	1.55	0.643676
Rep.	1.25	0.802159
ROA	1.03	0.974539
Geog_Prox.	1.02	0.984991
Mean VIF	3.33	



**Table 9. The correlation analysis**

	FLYG	TR	FDI	ILLIQ	VOLT	OC	Rep.	Geog. Prox.	ROA	MC	GDP
FLYG	1.00										
TR	-0.0059	1.00									
	0.5546										
FDI	0.0031	0.8644	1.00								
	0.7618	0.0000									
ILLIQ	-0.0100	0.2440	0.2439	1.00							
	0.3800	0.0000	0.0000								
VOLT	0.0585	0.1436	0.1013	0.5869	1.00						
	0.0000	0.0000	0.0000	0.0000							
OC	-0.1203	0.1093	0.1985	0.1534	0.0412	1.00					
	0.0000	0.0000	0.0000	0.0000	0.0007						
Rep.	-0.0487	-0.0081	0.0477	0.0215	-0.0172	0.4169	1.00				
	0.0001	0.5123	0.0001	0.0944	0.1643	0.0000					
Geog. Prox.	0.0011	0.0080	0.0176	0.0282	0.0018	0.1005	0.0588	1.00			
	0.9105	0.4300	0.0835	0.0144	0.8711	0.0000	0.0000				
ROA	0.0256	-0.1097	-0.1126	-0.0760	-0.0568	-0.0236	0.0412	-0.0035	1.00		
	0.0189	0.0000	0.0000	0.0000	0.0000	0.0675	0.0016	0.7530			
MC	-0.2977	0.4495	0.5733	0.1111	-0.0519	0.3215	0.1362	-0.0024	-0.0730	1.00	
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8107	0.0000		
GDP	-0.1935	-0.6107	-0.3967	-0.0885	-0.0891	0.2473	0.1724	-0.0097	0.0290	0.3236	1.00
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3383	0.0077	0.0000	

the independent variables exists if the coefficients of the independent variables are higher than 0.90 (Al-Yousfi, 2017; Pallant, 2011). The result reported in Table 9 shows that there is no evidence of multicollinearity between the independent variables of the study, which means that the independent variables are justified for inclusion in the study model.

#### 4.4. Homoscedasticity/heteroscedasticity analysis

Homoscedasticity is an important assumption of the classical linear regression model which suggests that the variance of the residuals about the predicted DV scores should be the same for all the predicted scores (Hickey et al., 2019; Pallant, 2011). Following Al-Yousfi study, the current study identifies the existence of heteroskedasticity using the Breusch-Pagan-Godfrey test Since it assumes unequal error variance, the null hypothesis of homoscedasticity is rejected if heteroskedasticity is significantly present in the model (Al-Yousfi, 2017).

Table 10 reports that  $F(11, 5334) = 139.76$  and  $\text{Prob} > F = 0.000$ , whereas  $P$ -value is below 0.01 ( $p < 0.0$ ). Table 12 reports the Modified Wald test for group-wise heteroscedasticity which confirms the same result with  $p$ -value = 0.0000. This result is strongly significant and therefore the null hypothesis of homoscedasticity is rejected. This indicates the presence of heteroscedasticity among the variables. However, the use of the GMM estimator is expected to control unobserved heterogeneity problems (Al-Yousfi, 2017).

**Table 10. Breusch-Pagan/Cook-Weisberg test for heteroskedasticity**

Source	SS	df	MS	Number of obs = 5,346		
Model	279.8139	11	25.43763	F(11, 5334) = 139.76		
Residual	970.8137	5,334	0.182005	Prob > F = 0.0000		
Total	1250.628	5,345	0.233981	R-squared = 0.2237		
				Adj R-squared = 0.2221		
				Root MSE = .42662		
FLYG	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
TR	0.0769	0.0129	5.9400	0.0000	0.0515	0.1022
FDI	0.6896	0.1393	4.9500	0.0000	0.4165	0.9628
ILLQI	-2.0154	0.8224	-2.4500	0.0140	-3.6276	-0.4032
VOLT	0.0345	0.0269	1.2800	0.2000	-0.0182	0.0873
OC	-0.1298	0.0243	-5.3400	0.0000	-0.1774	-0.0822
Rep.	0.0051	0.0266	0.1900	0.8470	-0.0470	0.0572
Geog- Prox.	0.0000	0.0000	0.9600	0.3380	0.0000	0.0000
ROA	0.1529	0.0489	3.1300	0.0020	0.0571	0.2487
MC	-0.8156	0.0438	-18.6400	0.0000	-0.9013	-0.7298
GDP	-0.0461	0.0585	-0.7900	0.4310	-0.1608	0.0687
Cons	9.6130	0.4035	23.8200	0.0000	8.8219	10.4040

**4.5. Auto-correlation analysis**

The Arellano-Bond serial autocorrelation, first-order auto-correlation AR(1), and second-order autocorrelation AR(2) test are used. The AR(2) test is the most important one where the expected probability should be insignificantly higher than 5% to confirm the absence of serial autocorrelation (Al-Yousfi, 2017; Ismail et al., 2018; Labra Lillo & Torrecillas, 2018).

Table 11 presents the result of the differentiated residual of AR(1) and AR(2) for testing the null hypothesis namely H0: no autocorrelation. The p-value for AR(1) is around (0.0000) which means that the null hypothesis is rejected; however, the p-value for AR(2) for all the models presented fails to reject the null hypothesis of the absence of second-order serial autocorrelation. This indicates that all available lagged values of the dependent variable in model 1 can be used as instruments whilst model 2 only lagged (2 7) and model 6 only lagged (1 3) can be used as instruments. This confirms that the GMM regression model is the appropriate model for this study.

**Table 11. First AR(1) and second AR(2)**

	Model 1 all lags	Model 2 lag(2 7)	Model 3 lag(1 3)
	Coef. P> z	Coef. P> z	Coef. P> z
No. of observation	5779	5217	5217
Number of firms	531	524	524
Number of instruments	21	15	17
AB test AR(1) p-value)	0.000	0.000	0.000
AB test AR(2) p-value)	0.262	0.807	0.609

**Table 12. GMM regression analysis**

	Model 1 all lags		Model 2 lag(2 7)		Model 3 lag (1 3)	
	Coef. P> z	Corrected Std. Err.	Coef. P> z	Corrected Std. Err.	Coef. P> z	Corrected Std. Err.
FLYG L1.	0.2444 (0.0000)***	0.0524	0.3537 (0.0230)**	0.1552	0.0857 (0.0050)***	0.0307
TR	0.2000 (0.0460)**	0.1003	0.4331 (0.0000)***	0.1123	0.2736 (0.0040)***	0.0958
FDI	-2.2770 (0.0020)***	0.7369	-1.2665 0.1430	0.8648	2.2497 (0.0000)***	0.4945
ILLQI	-6.6842 0.5080	10.1085	31.7806 (0.0260)**	14.2415	-3.5551 0.5290	5.6531
VOLT	-0.3557 0.1960	0.2752	-0.3563 0.1750	0.2624	-0.2167 0.1620	0.1548
OC	3.5391 (0.1030)*	2.1697	-5.0485 (0.0240)**	2.2300	2.8724 (0.0540)**	1.4899
Rep.	-9.7140 (0.1090)*	6.0605	14.1723 (0.0340)**	6.6882	-8.1334 (0.0620)*	4.3580
Geog- Prox.	0.0000 0.7860	0.0001	0.0000 0.5590	0.0001	0.0000 0.5590	0.0000
ROA			7.9127 (0.0000)***	2.0793	0.5523 (0.0960)*	0.3320
MC			-1.1604 (0.0000)***	0.2968	-1.2750 (0.0000)***	0.1802
GDP			1.2494 (0.0500)**	0.6384		
Indo_dummy1						
Maly_dummy2					-0.7805 (0.0560)**	0.4090
Phe_dummy3					-0.9389 (0.0010)***	0.2919
Sing_dummy4					-1.2776 (0.0070)***	0.4743
Thai_dummy5					-0.5156 (0.0070)***	0.1911
Constant	0.1595 0.8370	0.7751	-2.0593 0.7210	5.7592	14.9985 0.0000	2.0484
No. of observation	5779		5217		5217	
Number of firms	531		524		524	
Number of instruments	21		15		17	
Wald-test $X^2$	28.56***		47.52***		235.04***	
Sargan test (p-value)	0.000		0.008		0.128	
Hansen test (p-value)	0.126		0.058		0.242	
AB test AR(1) p-value)	0.000		0.000		0.000	
AB test AR(2) p-value)	0.262		0.807		0.609	

Note: Indo\_dummy1, Maly\_dummy2, Phe\_dummy3, Sing\_dummy4, and Thai\_dummy5 are referring to the country dummy for Indonesia, Malaysia, the Philippines, Singapore, and Thailand. A robust standard error have been used and reported to deal with the endogeneity and overidentifying restrictions (Baum et al., 2003).

#### 4.6. Regression analysis

This study employs the GMM regression analysis that is expected to solve the problems of unobserved heterogeneity, endogeneity, autocorrelation, and non-normality which cannot be solved by fixed effect, or by using OLS which is expected to lead to inconsistent and biased estimates (Arellano & Bond, 1991; Bond, 2002; Bond et al., 2001). Based on the objective of this study which is to evaluate the determinant of dual listing decision, the foreign listing yearly growth of firms is used as the dependent variable to evaluate the increase in the number of firms pursuing a dual listing.

The result shows three models; the first is applied with the main determinants without control variable to examine the motivation for firms dual listing decision. The second model entails the control variables at the company level which use ROA and at the country-level that use MC, and the GDP which only used lags (2 7) for the instrumental variables. The third model which is also control for the country used as a dummy variable that only gives accepted results used lags (1 3) for the instrumental variables. The result reported in Table 12 shows the coefficients and the significance of the regression model, the standard error, the country variable which is used as a dummy variable to attain robust findings and to avoid noise on the main variables of interest.

Table 12 reports the GMM model result as well as several examinations used to check the effectiveness and reliability of the model such as the Sargan test and Hansen test which used to examine the over-identifying restrictions in evaluating the validity of the overall instruments. Sargan and Hansen test for over-identifying restrictions should fail to reject the null hypothesis to confirm that the instruments used in the FLYG analysis are valid. In order to limit the instrument count, the study followed the recommendation of Roodman (2009) who suggested restricting the lag ranges used by collapsing the instrument utilized in the model. Furthermore, Wald test reported in Table 12 explains the overall significant result of the model, which is found to be highly significant.

The result reported in Table 12 shows that the lagged dependent variable (FLYGt-1) displays a positive and highly significant coefficient across all models. This result suggests a high level of determination among the firms seeking dual listing, as well as provides evidence about the importance of using the dynamic model in this study. Furthermore, it also presents the firms' preference in pursuing dual listing in foreign markets, and how the prior year's foreign listing can be used to determine the current year's dual listing. The result shows that the increase in the prior year's foreign listing by one percent is expected to lead to an increase in the current year's foreign listing by an average of 23% percent. This means that the prior period's foreign listing growth is expected to enhance the firms' preference in seeking a dual listing in the next period.

This study evaluated the determinants (trade openness, FDI openness, stock liquidity, stock volatility, ownership concentration, reputation, and geographical proximity) to specify the importance of each determinant in the dual listing decision of firms from ASEAN-5 countries. The trade openness results show a positive and highly significant result, with a coefficient between 0.20--0.43, which indicated that firms from countries that examine growth in their trade openness are more likely to pursue a dual listing. In other words, the higher the country's trade openness, the higher the tendency of the firms from that country to pursue a dual listing in the foreign market. This is in line with the market integration expectation that the integration of these markets will lead to facilitate the capital flow and remove the barriers and allow firms to be listed abroad easily (Avdic & Resulovic, 2006; Chouinard & D'Souza, 2004; Mu, 2014; Yin, 2010).

Besides, the FDI openness is also used to assess market integration, the results attained were mixed, the findings for the first and second model indicate a negative and significant determinant of the FDI in the YLYG, this suggests that firms from countries that realize a reduction in their FDI are more likely to pursue a dual listing. This result is in line with the finding of Cavoli et al. (2011)

and Kruse et al. (2011) that FDI openness has a negative relationship to the firms' preference to have an additional foreign listing. In other words, firms from countries that realize growth in their FDI tend to have a lower tendency to pursue a dual listing in foreign markets. This means that investors can enter the firms' home market. Hence, the firms' preference to pursue a listing in the host market to attract more investors is lower. However, the third model presents a positive and significant result which contradicts the previous models, this indicates that the increase in the FDI openness of the home capital market may encourage firms to pursue a dual listing.

In terms of stock liquidity, which is measured by illiquidity, only the second model shows a positive and significant result. This indicates that the higher the firm's illiquidity, the higher the tendency to seek a dual listing. The positive relationship with the illiquidity proxy indicates a negative relationship with stock liquidity. This suggests that the lower the firms' stock liquidity, the higher their tendency to pursue a dual listing. This is in line with previous studies that showed firms with low liquidity experience an improvement in the stock liquidity after listing abroad (for example, see (Ayyagari & Doidge, 2010; King & Mittoo, 2007; Makau et al., 2015).

The study examines the determinant of the ownership concentration in the dual listing decision. The positive and significant result of the ownership concentration indicates that the higher the firm's ownership concentration, the higher they pursue dual listing abroad to reduce the ownership concentration. This result reveals that a percentage increase in the ownership concentration is associated with an increase in the firms seeking dual listing between 2.87% and 3.54%. This is in line with the result that firms listing in more efficient markets driven by their preference to reduce the controlling shareholders/ownership concentration (Ayyagari & Doidge, 2010; King & Mittoo, 2007; Koowattananaijai & Prayarach, 2016). The positive result can be interpreted by the firms' preference to reduce the control of the top three shareholders, so as to attract foreign investors who are wary about the concentration of decision-making being in the hand of small shareholders, families, or individuals. However, the current result going against Luo (2014) who showed a negative effect if the ownership concentration on the dual listing which interpreted by the control of the government and state for Chinese firms.

The result indicates a negative and significant association with the firms' reputation in the first and third models. This suggests that the lower the firms' reputation the higher they seek dual listing abroad to enhance their reputation. Table 12 shows that a percentage change in the firms' reputation is associated with a change in the firm's preference to seek dual listing by 8.13–14.17%. This indicates that the lower the outstanding shares owned by foreign investors the higher these firms pursue dual listing abroad. This finding is in line with that of previous studies that suggested firms bond themselves to major markets to improve their reputation (Karolyi, 2012; Shen et al., 2010). This is also in line with the sample characteristics which presented that more than 80% of ASEAN-5 firms are found to seek a dual listing in the US and Germany.<sup>3</sup>

The result of the three control variables shows that ROA presents positive and significant results for the second and third models. The result indicates that the higher the ROA, the more likely for the firms to pursue a dual listing. In other words, firms that experience an increase in their ROA are more likely to list abroad. This result is similar to Cetorelli and Peristiani (2015), and Koh et al. (2013) in their study that firms that realize growth in their ROA are more likely to listing abroad compared with cross-listing with those that don't. In contrast, Luo (2014) found a negative and significant result of the ROA on the dual listing. Market capitalization shows a significant but negative coefficient. This result indicates that firms from countries with lower market capitalization are more encouraged to pursue a dual listing. Similar to Balli et al. (2014) and Sharma and Wongbangpo (2002) that ASEAN countries experience growth in their market capitalization

which also encourages firms to have an additional listing in foreign markets. With regards to the GDP, the second model result shows a positive and significant result. This result means that firms originated from developing countries that experience an increase in their GDP are found to seek a dual listing in foreign markets. In other words, firms from countries with high growths in GDP demonstrate higher tendencies to seek a dual listing.

The study uses the country as a dummy variable, the result reports a negative and statistically significant result for Malaysia, the Philippines, Singapore, and Thailand which suggests that the dual listing growth of the firms from those countries is lower than that of Indonesia. To sum up, the result provides evidence about the relationship between the above-mentioned motivations i.e. “explanatory variables” and the foreign listing yearly growth the dependent variable. It reveals how they affect the dual listing decision. Table 13 summarizes the significance of the results obtained. The result showed that all the explanatory variables mostly experience a significant relation with the dependent variable except geographic proximity which reports the insignificant result for all models. This can be interpreted by the improvement in trading technology “trading networks/platform” that make the distance between home and host market less important (Chouinard & D’Souza, 2004; Karolyi, 2006; Wang & Zhou, 2015).

### 5. Conclusion

The current study provides evidence about the relationship between the determinants specifically market integration, stock liquidity, stock volatility, ownership concentration, reputation, and geographical proximity, and the dual listing decisions. This fills the gap regarding the lack of studies that

**Table 13. The result summary**

	<b>Model 1 all lags</b>	<b>Model 5 lag(2 7)</b>	<b>Model 6 lag (1 3)</b>
	<b>Coef.</b>	<b>Coef.</b>	<b>Coef.</b>
FLYG	Sig.	Sig.	Sig.
L1.			
TR	Sig.	Sig.	Sig.
FDI	Sig.	inSig.	Sig.
ILLIQ	inSig.	Sig.	inSig.
VOLT	inSig.	inSig.	inSig.
OC	Sig.	Sig.	Sig.
REP.	Sig.	Sig.	Sig.
Geog.- Prox.	inSig.	inSig.	inSig.
ROA	inSig.	Sig.	Sig.
MC	inSig.	Sig.	Sig.
GDP	inSig.	Sig.	inSig.
M c_dummy2	inSig.	inSig.	Sig.
P c_dummy3	inSig.	inSig.	Sig.
S c_dummy4	inSig.	inSig.	Sig.
T c_dummy5	inSig.	inSig.	Sig.
Wald-test $X^2$	Sig.	Sig.	Sig.
Sargan test	Sig.	Sig.	inSig.
Hansen test	inSig.	inSig.	inSig.
AB test AR(2)	inSig.	inSig.	inSig.

examine the determinants which encourage firms to pursue a dual listing particularly in the context of firms from ASEAN-5 markets that found to experience market integration which is going against the segmentation assumption. Furthermore, the GMM model employed in this study is considered as a superior technique to evaluate these determinants which provided more robust empirical evidence about the determinants that motivate the ASEAN-5 firms to take the dual listing decision. The empirical finding reported significant results for market integration (as measured by trade openness, and FDI openness), stock liquidity, ownership concentration, and reputation. As well as a significant result was found for the control variables ROA, market capitalization, and GDP.

This finding contributes to the existing body of knowledge by providing evidence of the driving force of market integration, stock liquidity, ownership concentration, and reputation in encouraging firms to pursue a dual listing. The insignificant results attained for stock volatility and geographical proximity can be interpreted as the latter is a result of the improvement in trading technology that renders the distance between the home and the host market less relevant. The findings assist the authorities in the ASEAN to have better understanding for the importance of integration of their region in the dual listing decision from two prospect. The trade openness improvement led to encourage firms to list abroad, and the FDI that found negatively affects the dual listing decision. This alerts the authorities in the ASEAN to balance between the measures taken regarding the capital market openness and the facilitation of the listing requirements as they achieve the same purpose. Furthermore, the finding asserts for the authorities regarding a number of steps they need to take into account to encourage firms to pursue a dual listing within their region such as improve their liquidity and reduce firms' ownership concentration. Moreover, it provides evidence for the investors, issuing banks, and market makers regarding those firms that listing abroad on what steps are taken to improve their equities status and ownership structure to be unique from their counterparts.

The use of the GMM model is expected to provide robust evidence, however, the full model with control and country dummy variables showed a significant result only with lag instrumental variable (1 3). Therefore, further examination can be suggested by adding additional explanatory and instrumental variables such as the sales growth which is suggested as the main goal for firms going international as it is considered a determinant for firms to listing abroad. Furthermore, Multinational Corporation (MNC) can be examined to assess whether those firms are more likely to pursue a dual listing in comparison with their counterparts that they do not list abroad.

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#### Notes

1. DR is a certificate representing ownership of the shares of the foreign company, allowing the stock to be traded in the host market, where the home market

equity shares serve as the underlying to a certificate or receipt issued on the host exchange by a third party (Wanjiru, 2013).

2. The data needed for examination is from 2003 to 2017. The 2003 is chosen as starting point for the period as it is the year that according to Bali Concord II, it is the first step for the ASEAN Economic Community (AEC) to insure the development of the ASEAN capital market (ASEAN, 2003).
3. The Frankfurt Stock Exchange is the world's 10th largest stock exchange by market capitalization(see: [https://en.wikipedia.org/wiki/Frankfurt\\_Stock\\_Exchange](https://en.wikipedia.org/wiki/Frankfurt_Stock_Exchange)). Firms from more than 80 countries are listed on the Frankfurt Stock Exchange, whereas about 50% from North and South America, 30% from Europe, 14% from Asia, and 6% from Australia and Africa <http://www.poems.com.hk/en-us/product-and-service/global-securities/europe/germany/>.

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