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Analysing the Macroeconomic Drivers of Stock Market Development in the Philippines

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Abstract

This paper analyses the macroeconomic drivers of stock market development in the Philippines during the period 2001Q4 to 2016Q4. In particular, the paper examines the impact of banking sector development, inflation rate, exchange rate, economic growth, trade openness, and stock market liquidity on the development of the Philippine stock market. Theoretical and empirical literature reveals diverse views on the relationship between each determinant and stock market development. In addition, the Philippine stock market has experienced remarkable growth in recent decades. However, there is no similar study on this country in the literature. The paper, therefore, enriches the literature by investigating the macroeconomic drivers of stock market development in the Philippines using ARDL bounds testing procedure. The results show that, trade openness has had a negative impact on Philippine stock market development in the long run, whereas the banking sector development and exchange rate have had positive impacts on the development of the Philippine stock market in the short run.

JEL codes*:* C22; E44; G23

Keywords: macroeconomic drivers; stock market development; the Philippines; ARDL bounds testing

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Introduction

What are the key macroeconomic drivers of stock market development? A number of studies show the importance of stock markets in promoting economic growth through various channels. These channels encompass reducing the cost of mobilising savings, providing market liquidity, improving corporate governance, and promoting international risk-sharing (see Jensen and Murphy 1990;

Levine 1991; Obstfeld 1994; Bencivenga et al. 1996; Greenwood and Smith 1997). Owing to its importance, an increasing number of studies have tried to answer the question by investigating the factors leading to the growth of stock markets. The macroeconomic factors being identified include economic development, banking sector development, inflation rate, exchange rate, foreign direct investment, trade openness and stock market liquidity.

While there is a number of studies examining the factors leading to the stock market development, the existing literature shows that the relationship between each of the macroeconomic factors and stock market development is highly debatable. For example, on the relationship between the banking sector and the stock market, some studies show that they are negatively related, while others show that they are positively related (see, for example, Levine 1997, 2005; El-Nader and Alraimony 2013). For the inflation rate, existing studies also show inconclusive results. Some argue that a higher inflation rate has a negative impact on stock market development, whereas others argue that the inflation rate can be positively associated with stock market returns in a high inflationary environment (see Boyd et al. 1996, 2001; Ben Naceur et al. 2007). With regard to the exchange rate, studies also show mixed results concerning the relationship between exchange rate behaviour and stock market performance (see Gavin 1989; Phylaktis and Ravazzolo 2005). On the relationship between foreign direct investment (FDI) and stock market development, studies also reveal opposing views (see Hausmann and Fernández-Arias 2000a, b; Malik and Amjad 2013). On the relationship between trade openness and stock market development, some studies show that trade openness exerts a positive impact on stock market development, whereas others find that it hurts stock market development (see Rajan and Zingales 2003; Kim et al. 2011, Niroomand et al. 2014). To sum up, the literature reveals diverse views on the impact of macroeconomic factors on stock market development. Against this background, this paper contributes to the existing debate by investigating the impact of various macroeconomic factors on stock market development in the Philippines.

In recent decades, the Philippine stock market has experienced phenomenal growth. Measured in terms of the share price index, namely PSEi, it increased from 1 869 points in 1997 to 7 230 points in 2014 (Philippine Stock Exchange [PSE] annual reports 2000-2014; World Federation of Exchanges [WFE] 2015). The growth momentum was shown by the consecutive growth of PSEi

during the period 2009 to 2014, with a cumulative growth of 286 per cent in these six consecutive years (WFE 2015). In addition, the extraordinary growth of the stock market in the country can be indicated by the size of the stock market as measured by the market capitalisation ratio. The global ranking of the PSE improved from 55th in 2005 to 12th in 2014 (World Development Indicators [WDI] 2016). Despite its remarkable growth, there is, to the best of our knowledge, no similar study on the drivers of stock market development in the Philippines. Therefore, this paper enriches the literature by investigating the macroeconomic drivers of stock market development in the country using autoregressive distributed lag (ARDL) bounds testing technique.

The rest of the paper is organised as follows: Section 2 provides an overview of stock market development in the Philippines. Section 3 discusses the theoretical and empirical underpinning of the determinants of stock market development. Section 4 outlines the empirical methodology and the data. Section 5 presents the empirical results. Finally, Section 6 concludes the paper.

2. Stock market development in the Philippines

The Philippine Stock Exchange (PSE), namely the Manila Stock Exchange established in 1927, is one of the oldest stock exchanges in Asia (PSE 2015; Visda et al. 2013). Over time, the number of listed securities increased as public interest grew. In 1963, a second stock exchange, namely the Makati Stock Exchange, was established and started to operate in 1965 in Makati (PSE 2012; World Bank 1992). During the 1970s, stock market activities were insignificant both in absolute and relative terms compared with other financial sectors. The trading volume was small and many listed companies were inactive for a significant period of time. Companies listing on the exchanges mainly consisted of those in the mining and oil sectors, where purely speculative movements took place (World Bank 1992).

In order to revitalise the stock market, the country has undergone a serious of reforms since the 1990s. These reforms include the unification of the two stock exchanges, the demutualisation of the stock exchange, and the enactment of the Securities Regulation Code (see Ho and Odhiambo 2015). The aim of the stock exchanges unification was to reduce confusion among investors. Such confusion stemmed from the different policies, different members, and, most importantly, different prices for

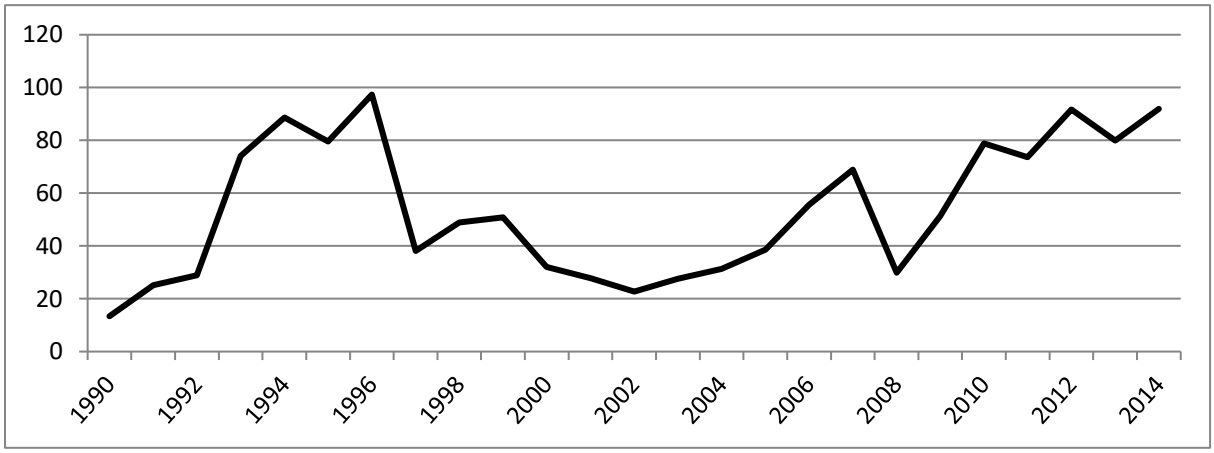
the same listed stocks on the two stock exchanges (PSE 2015). Another reason for the unification of the exchanges was to achieve economies of scale through reducing operating costs. Therefore, in 1992, the government introduced a policy of consolidating the operations of the two exchanges, and a unified stock exchange named the Philippine Stock Exchange (PSE) was incorporated (PSE 2015). This measure encouraged the development of a more efficient capital market by ensuring a level playing field for all investors, by consolidating logistics, and, as stated, by reducing operating costs (see De los Angeles 1995).

Another fundamental change was the demutualisation of the stock exchange in 2001 (Akhtar 2002). During the process of demutualisation, the PSE was transformed from a members' association into a for-profit stock corporation, in the process evolving into a new corporate, legal and business model. In the course of its transformation, the PSE underwent a series of structural changes in terms of ownership structure, the business of the stock exchange, trading rights, corporate governance, and its statutory regulatory role (Alinsunurin 2002). Later, in 2003, the PSE was listed by way of introduction, which significantly reduced broker ownership (Akhtar 2002). Alongside the structural reforms undertaken by the PSE, reforms were carried out to improve the regulatory capacity of the Securities and Exchange Commission (SEC). The SEC was established by the government early in 1936 as a primary regulatory authority in respect of the capital markets (World Bank 1992). However, the effectiveness of the SEC was hindered by the resource-intensive tasks such as company registration and monitoring, and quasi-judicial functions (International Monetary Fund [IMF] 2004; SEC 2015]. To allow the SEC to function effectively, the Securities Regulation Code (SRC) was enacted in 2000, which led to organisational change and capital-building (IMF 2004). The major achievements brought about by the SRC were confirmed by the assessment of security-regulation principles conducted by the IMF. The report noted that the country had performed very well against the principles of the International Organization of Securities Commissions (IMF 2004).

As a result of all the reforms, the Philippine stock market has experienced phenomenal growth over the years. Measured by the share price index, the PSEi generally trended upward during the period 1997 to 2014. It increased from 1 869 points in 1997 to 7 230 points in 2014 (PSE annual reports 1997-2014; WFE 2015). The growth momentum was shown by the consecutive growth of the PSEi

during the period 2009 to 2014, with a cumulative growth of 286 per cent in these six consecutive years (WFE 2015). In addition, the extraordinary growth of the stock market in the country was shown by the market capitalisation ratio. As indicated above, the global ranking of the PSE improved from 55th in 2005 to 29th in 2010, and leaped to 12th in 2014 (WDI 2016). As shown in Figure 1, the market capitalisation ratio experienced an upward trend, with volatile movements from 1990 to 2014. The ratio increased remarkably from 13 per cent in 1990 to 92 per cent in 2014, with an average of 8 per cent annual growth (WDI 2016). However, the liquidity of the Philippine stock market as measured in terms of turnover ratio has been low over the past two decades. In particular, the Philippines had the least liquid stock market in terms of turnover ratio among the ASEAN-5 countries[2] during the past two decades. Figure 1 shows the market capitalisation ratio of the PSE during the period 1990 to 2014. Figure 2 shows the turnover ratios of the ASEAN-5 stock exchanges during the period 1990 to 2014.

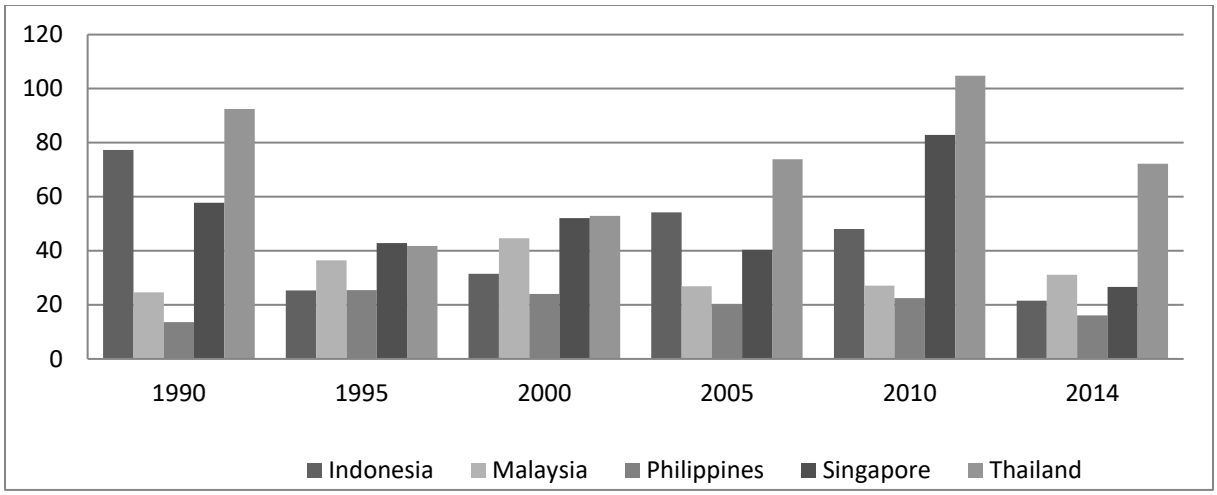
Figure 1: The market capitalisation ratio of the PSE, 1990-2014



Source: Authors' own compilation based on WDI (2016)

Figure 2: Turnover ratios of the ASEAN-5 stock exchanges, 1990-2014

[2] The Association of Southeast Asian Nations (ASEAN) was established in 1967 with the signing of the ASEAN Declaration by Indonesia, Malaysia, the Philippines, Singapore and Thailand. Later on, five other countries (Brunei Darussalam, Cambodia, Lao PDR, Myanmar and Vietnam) also joined this association. ASEAN is a regional economic integration which aims at sharing resources among members in the region and also increasing its bargaining potential in the world (ASEAN 2015).



Source: Authors' own compilation based on WDI (2016)

3. Literature review

Owing to the importance of stock markets in promoting economic growth, there are an increasing number of studies investigating the factors leading to the growth of stock markets. In the asset pricing models[3], there are two broad categories of factors influencing stock prices. The first category is the macroeconomic factors including: economic growth, foreign exchange, inflation, industrial production, interest rates, oil prices, stock market volatility, liquidity of stock market, returns on investment, and the risk factors that influenced the states of the current and future consumption. The second category is the portfolio characteristics. These characteristics include: book-market relations, dividends or earnings, the size of company, the rate of return, and the variance of asset returns (see Sharpe 1964; Fama 1965; Lintner 1965; Ross 1976; Merton 1973; Breeden 1979; Stulz 1981a, b; Cochrane 1991).

Apart from the asset pricing models, there are a huge volume of studies linking stock market development to various macroeconomic factors. The macroeconomic factors encompass: economic

[3] The asset pricing models include: Efficient Market Hypothesis (Fama 1965), Capital Asset Pricing Model (CAPM) (Sharpe 1964; Lintner 1965), Arbitrage Pricing Theory (Ross 1976), Intertemporal CAPM (Merton 1973), Consumption-based CAPM (Breeden 1979), International CAPM (Stulz 1981a, b), and Production-based Asset Pricing Model (Cochrane 1991).

development, banking sector development, inflation rate, exchange rate, foreign direct investment, trade openness and stock market liquidity. However, the relationship between these factors and the development of stock market are highly debatable in the literature (see Ho and Iyke 2017). Regarding the relationship between the development of the banking sector and the stock market, the results of studies are inconclusive. Some studies argue that the banking sector and stock market are negatively related, while others suggest they are positively related. As far as negative relationship is concerned, various studies show that the banking sector performs better than the stock market in providing financial functions for the economy (see DeAngelo and Rice 1983; Stiglitz 1985; Bhide 1993). However, other studies argue that the focus should be on the importance of the overall financial market rather than the relative importance of the banking sector compared with the stock market (see Merton and Bodie 1995, 2004; Levine 1997). Furthermore, Levine (2005) argues that the banking sector and stock market are positively related when they provide financial services for the economy. On the empirical front, however, many studies show that the banking sector and stock market are positively related. These studies include those of Garcia and Liu (1999), Ben Naceur et al. (2007), Kurach (2010), Yartey (2007, 2010), and El-Nader and Alraimony (2013).

As far as the inflation rate is concerned, existing studies show inclusive results on the relationship between inflation rate and stock market development. On the one hand, some argue that a higher inflation rate has negative impact on stock market development. For example, theoretical studies such as Azariadas and Smith (1996), Choi et al. (1996), Huybens and Smith (1998, 1999) and Boyd et al. (2001) argue that higher inflation rates are associated with less liquid and smaller stock markets. In addition, they demonstrate that there exists a non-linear relationship between the inflation rate and financial market development, including stock market development. The empirical studies also support the argument that there is a negative and non-linear relationship between the inflation rate and stock market development (see Boyd et al. 1996, 2001; Ben Naceur et al. 2007; Şükrüoğlu and Nalin, 2014; Bayar 2016). On the other hand, other studies reveal that inflation rate can have positive impact on the stock market through stock returns in a high inflationary environment (see Barnes et al. 1999; Boyd et al. 1996, 2001).

In terms of the exchange rate, economic theories demonstrate a strong association between exchange rate behaviour and stock market performance. They argue that currency appreciation (or depreciation) can have a negative (or positive) impact on stock prices (see Dornbusch and Fisher 1980; Jorion 1991). On the other hand, Gavin (1989) indicates that the relationship between exchange rate and stock prices can be positive or negative under different conditions. Such inconclusive results are also found in the empirical studies. For example, Ma and Kao (1990) find that currency appreciation adversely affects the stock market in an export-oriented economy, while it positively affects the stock market in an import-oriented economy. In contrast, Phylaktis and Ravazzolo (2005) show that stock prices and exchange rates are positively related.

On the relationship between FDI and stock market development, existing theoretical studies reveal opposing views. Some studies argue that FDI is simply a substitute for domestic stock market development, whereas others show that FDI promotes the growth of stock markets (see Hausmann and Fernández-Arias 2000a, b; Claessens et al. 2001). These opposing views are also found in the empirical studies. For example, Jeffus (2004) examines the nature of the association between FDI and stock markets in four Latin American countries and finds that FDI and stock market development are positively correlated. In the same vein, the findings of Malik and Amjad (2013) also show a positive relationship between FDI and aggregate market capitalisation in Pakistan. In contrast, Rhee and Wang (2009) show a negative association between FDI and stock market liquidity in Indonesia.

On the relationship between the trade openness and stock market development, some studies show that trade openness exerts a positive impact on stock market development whereas others find that it hurts stock market development. In terms of positive relationship, theories suggest that trade openness benefits financial market development, including stock market, in two different ways, which can be described as ‘supply-side’ and ‘demand-side’ roles (Niroomand et al. 2014). The former one states that trade openness is conducive to the development of financial market through the supply side of financial market (see Rajan and Zingales 2003; Braun and Raddatz 2005). The latter one argues that trade openness foster development of financial market by raising the demand on financial services and products (see Newbery and Stiglitz 1984; Svaleryd and Vlachos 2002). In terms of negative

relationship, some empirical studies such as those of Jin (2006), Baltagi et al. (2009), and Kim et al. (2011) find that trade openness indeed inhibits the development of stock market.

The only consensus that has been reached is the impacts of economic development and the stock market liquidity on the stock market development. With respect to the relationship between economic development and stock market development, the theoretical literature in general suggests that real income level and real income growth have positive impacts on stock market development. These models show that there is a significant fixed cost associated with the formation of financial markets, including the stock market. When the economy develops, the relative importance of this fixed cost reduces. Therefore, more people can participate in the financial market (see Greenwood and Jovanovic 1990; Greenwood and Smith 1997; Boyd and Smith 1998). On the empirical front, the positive relationship between economic growth and stock market development is well documented in the existing literature – see, for instance, Atje and Jovanovic (1993), Levine and Zervos (1998), Garcia and Liu (1999), El-Wassal (2005), Adjasi and Biekpe (2006), Kurach (2010), Yartey (2007, 2010), Raza et al. (2015), Bayar (2016), Ho (forthcoming). In addition, concerning the relationship between stock market liquidity and stock market development, there is a concerted view that the liquidity of stock market is conducive to the development of stock market. These studies include those of Garcia and Liu (1999), Ben Naceur et al. (2007), Yartey (2007, 2010), Cherif and Gazdar (2010), Kurach (2010), El-Nader and Alraimony (2013), Şükrüoğlu and Nalin (2014), Bayar (2016).

4. Methodology and data

4.1 ARDL bounds testing procedure for co-integration

The present study uses the autoregressive distributed lag (ARDL) bounds testing procedure suggested by Pesaran et al. (1996), Pesaran and Shin (1999), and Pesaran et al. (2001) to investigate the long-run relationships between the development of a stock market and its sets of macroeconomic factors. This procedure is preferred to other procedures because it does not impose the restrictive assumption that all the variables being studied must be integrated of the same order. Instead, it can be applied to the time series which are integrated of order zero, one, or a mixture of both. In addition, while other co-integration tests are sensitive to the sample size, the ARDL bounds test is suitable even when the

sample size is small (see Pesaran et al. 1996; Pesaran and Shin 1999; Pesaran et al. 2001). In this paper, the ARDL bounds testing procedure employs the equation

$$\Delta lnMCR_t = \gamma_0 + \sum_{i=1}^{n} \gamma_{1i}\, \Delta lnMCR_{t-i} + \sum_{i=0}^{n} \gamma_{2i}\, \Delta lnBNK_{t-i} + \sum_{i=0}^{n} \gamma_{3i}\, \Delta lnINF_{t-i} + \sum_{i=0}^{n} \gamma_{4i}\, \Delta lnREERI_{t-i}$$
$$+ \sum_{i=0}^{n} \gamma_{5i}\, \Delta lnRGDPG_{t-i} + \sum_{i=0}^{n} \gamma_{6i}\, \Delta lnOPEN_{t-i} + \sum_{i=0}^{n} \gamma_{7i}\, \Delta lnTOR_{t-i} + \delta_1 lnMCR_{t-1}$$
$$+ \delta_2 lnBNK_{t-1} + \delta_3 lnINF_{t-1} + \delta_4 lnREERI_{t-1} + \delta_5 lnRGDPG_{t-1} + \delta_6 lnOPEN_{t-1}$$
$$+ \delta_7 lnTOR_{t-1} + \varepsilon_t \qquad (1)$$

where ε, γ, and δ are the white-noise error term, the short-run coefficients, and the long-run coefficients of the model, respectively, and Δ is the first difference operator. In addition, *t* denotes time period, and *n* is the maximum number of lags in the model. The variables, namely $lnMCR$, $lnBNK$, $lnINF$, $lnREERI$, $lnOPEN\ and\ lnTOR,$ are the natural logarithms of the market capitalisation ratio, domestic credit to gross domestic product (GDP), inflation rate, real effective exchange rate index, trade as a percentage of GDP and turnover ratio, respectively. Furthermore, the maximum number of lags in the model is chosen based on the Schwarz criterion (SC).

In the first stage, the null hypothesis of the no co-integration relationship

$$H_0 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = 0$$

is tested against the alternative hypothesis of the existence of a co-integration relationship

$$H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq 0$$

From Equation (1), there are co-integrating relationships between the series if at least one of the δs is significantly different from zero. The second stage is to consider the F-statistic. There are two sets of critical values that have been constructed by Pesaran et al. (2001) under this null hypothesis. We do not reject the null hypothesis of no co-integration when the F-statistic falls below the lower-bound values. Similarly, we reject the null hypothesis of no co-integration when the calculated F-statistic is greater than the upper-bound values. However, when the F-statistic falls between the lower and upper bounds, the test is inconclusive.

If the variables are found to be co-integrated, then the study proceeds to estimate the short-run behaviour of the variables using an error-correction model formulated as

$$\Delta lnMCR_t = \gamma_0 + \sum_{i=1}^{n} \gamma_{1i}\, \Delta lnMCR_{t-i} + \sum_{i=0}^{n} \gamma_{2i}\, \Delta lnBNK_{t-i} + \sum_{i=0}^{n} \gamma_{3i}\, \Delta lnINF_{t-i} + \sum_{i=0}^{n} \gamma_{4i}\, \Delta lnREERI_{t-i} + \sum_{i=0}^{n} \gamma_{5i}\, \Delta RGDPG_{t-i} + \sum_{i=0}^{n} \gamma_{6i}\, \Delta lnOPEN_{t-i} + \sum_{i=0}^{n} \gamma_{7i}\, \Delta lnTOR_{t-i} + \delta ECM_{t-1} + \varepsilon_t \quad (2)$$

where δ is the coefficient of the error-correction term, ECM_{t-1}. δ is expected to have a negative sign. This implies that, when the variables drift apart from the equilibrium level in the short run, they can quickly adjust back to their equilibrium levels.

4.2 Data and identification of variables

This study utilises quarterly time-series data covering the period 2001Q1 to 2016Q4. The covering period in the study is solely dictated by the data availability. The data have been obtained from different sources, including: the International Financial Statistics of the International Monetary Fund (IFS 2017); and the World Federation of Exchanges (WFE 2014, 2017). To assess the macroeconomic drivers of stock market development, the study needs: a measure of stock market development and measures of macroeconomic variables. In terms of stock market development, the study uses the market capitalisation ratio to measure the development of the stock market. This is the value of listed domestic shares on the domestic exchange divided by GDP. This indicator is used based on the following considerations. First, the level of market capitalization is a desirable indicator which reflects the ability of the stock market in mobilizing capital and diversifying risk (Demirgüç-Kunt and Levine 1996). Second, this proxy has also been widely used to measure stock market development in other empirical studies (see, for example, Garcia and Liu 1999; Boyd et al. 2001; Yartey 2007, 2010; Şükrüoğlu and Nalin 2014). Third, despite the fact that stock market is a multifaceted concept that can be measured by various indicators, Demirgüç-Kunt and Levine (1996) argue that all of these stock market indicators are significantly correlated. Therefore, the market

capitalisation ratio is used to measure stock market development in this study. Table 1 show the proxies, sources and justifications of all the variables used in this study.

Table 1: Proxies, sources and justifications of the variables used in this study

Variable	**Proxy**	**Source**	**Justification**
Stock market development (MCR)	Market capitalisation to GDP	Authors' calculation based on WFE (2014, 2017) and IFS (2017)	Garcia and Liu (1999), Boyd et al. (2001), Yartey (2010), Şükrüoğlu and Nalin (2014)
Banking sector development (BNK)	Domestic credit to GDP	Authors' calculation based on IFS (2017)	Levine et al. (2000), Beck et al. (2007), Sehrawat and Giri (2016)
Inflation rate (INF)	Annual percentage change of consumer price index	Authors' calculation based on IFS (2017)	Shan et al. (2001), Boyd et al. (2001), Marques et al. (2013)
Exchange rate (REERI)	Real effective exchange rate index	IFS (2017)	Calvo et al. (1993), Abdalla and Murinde (1997), Chou (2000)
Economic growth (RGDPG)	Annual percentage change in real GDP	Authors' calculation based on IFS (2017)	Levine and Zervos (1998), Deb and Mukherjee (2008), Carp (2012)
Trade openness (OPEN)	Sum of exports and imports of goods and services as a share of GDP	Authors' calculation based on IFS (2017)	Rajan and Zingales (2003), El-Wassal (2005), Niroomand et al. (2014)
Stock market liquidity (TOR)	Turnover ratio	Authors' calculation based on WFE (2014, 2017).	Garcia and Liu (1999); Yartey (2007); Billmeier and Massa (2009)

Source: Authors' own compilation

5. Empirical results

5.1 Results of stationarity tests

As a preliminary analysis, and prior to examining the nature of the relationship between stock market development and its sets of macroeconomic drivers, the stationary properties are examined. The variables include the market capitalisation ratio, domestic credit to GDP, the inflation rate, real

effective exchange rate index, real GDP growth, value of exports and imports to GDP, and turnover ratio. To examine their stationary properties, the study uses two unit roots tests. They are the Dickey–Fuller generalised least squares (DF-GLS) test developed by Elliot et al. (1996), and the Perron (PPURoot) test developed by Perron (1997). Table 2 shows the results of unit roots tests of the variables in levels and at the first differences.

Table 2: Results of unit roots tests of the variables in levels and at the first differences

Dickey-Fuller Generalized Least Squares (DF-GLS) Test				
Variable	Stationarity of all variables in levels		Stationarity of all variables at first differences	
	Without trend	With trend	Without trend	With trend
lnMCR	-0.346	-3.647**	-5.133***	-2.914*
lnBNK	-0.751	-0.893	-3.050***	-3.750***
lnINF	-2.856***	-3.233**	-	-
lnREERI	-0.332	-1.665	-4.762***	-5.409***
lnRGDPG	-3.037***	-3.371**	-	-
lnOPEN	-1.288	-1.771	-2.537**	-3.591**
lnTOR	-2.038**	-3.303**	-	-
Perron (PPURoot) Test				
Variable	Stationarity of all variables in levels		Stationarity of all variables at first differences	
	Without trend	With trend	Without trend	With trend
lnMCR	-4.017	-4.357	-5.645**	-6.458***
lnBNK	-3.097	-4.055	-21.313***	-20.614***
lnINF	-4.252	-4.263	-5.607**	-5.434**
lnREERI	-4.446	-3.624	-7.308***	-7.214***
lnRGDPG	-5.171*	-3.713	-8.251***	-5.456***
lnOPEN	-3.253	-3.151	-14.213***	-12.911***
lnTOR	-5.012*`	-5.705**	-	-

Source: Authors' own compilation.
Notes: (i) *, ** and *** denote significance at 10%, 5% and 1%, respectively; (ii) "-" denotes "not applicable".

In Table 2, the results show that variables such as *lnTOR* are stationary in levels, while *lnMCR*, *lnBNK*, *lnREERI* and *lnOPEN* are stationary at the first differences. For the variables such as *lnINF*, and *lnRGDPG*, the Dickey-Fuller Generalized Least Squares test shows that they are stationary in

levels, while the Perron test suggests that they are stationary at first differences. Having established that the variables are integrated of order zero [I(0)] or one [I(1)], the study can proceed to test the long-run relationships between the stock market development and its drivers using the ARDL bounds testing procedure.

5.2 Empirical analysis using the ARDL bounds testing procedure

The results of the ARDL bounds test for co-integration show that the calculated F-statistic is 3.586, which is higher than the critical value reported by Pesaran et al. (2001) in Table CI (iii) Case III. Therefore, the results show that the variables used are co-integrated. See Table 3 for the result of ARDL bounds testing for co-integration, and the critical values of the ARDL bounds test. Having found that *lnMCR, lnBNK, lnINF, lnREERI, lnRGDPG, lnOPEN* and *lnTOR* are co-integrated, the study estimates the model using the ARDL bounds test approach. The first step is to determine the optimal lag length for the model using the Schwarz criterion (SC). The optimal lag length selected based on SC is ARDL (2, 1, 0, 3, 0, 1, 0). The long-run and short-run results of the selected model are reported in Table 4.

Table 3: Bounds test *F*-test for co-integration

Dependent Variable	Function				F-statistic	Cointegration Status
lnMCR	F(*lnMCR* | *lnBNK, lnINF, lnREERI, lnRGDPG, lnOPEN, lnTOR*)				3.586*	Cointegrated
Asymptotic critical value (k=6)						
Pesaran et al. (2001), p.300, Table CI(iii) Case III	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	3.15	4.43	2.45	3.61	2.12	3.23

Note: * denotes significance at 10%.

Table 4: The long-run and short-run results of the selected model

Long-run results

Dependent variable is *lnMCR*				
Regressor	**Coefficient**	**Standard error**	**T-ratio**	**Probability**
LnBNK	0.311	0.582	0.534	0.596
LnINF	-0.205	0.176	-1.164	0.251
LnREERI	-2.001	1.912	-1.047	0.301
LnRGDPG	0.105	0.086	1.219	0.229
LnOPEN	-2.336**	1.142	-2.045	0.047
LnTOR	0.059	0.233	0.252	0.802
Short-run results **Dependent variable is Δ*lnMCR***				
Regressor	**Coefficient**	**Standard error**	**T-ratio**	**Probability**
Δ*lnMCR(-1)*	0.335***	0.095	3.538	0.001
Δ*lnBNK*	1.104***	0.349	3.161	0.003
Δ*lnINF*	-0.030	0.033	-0.909	0.368
Δ*lnREERI*	1.440***	0.416	3.462	0.001
Δ*lnREERI(-1)*	-0.082	0.464	-0.177	0.860
Δ*lnREERI(-2)*	1.303**	0.505	2.582	0.013
Δ*lnRGDPG*	0.001	0.025	0.032	0.975
Δ*lnOPEN*	0.078	0.206	0.381	0.705
Δ*lnTOR*	0.045	0.032	1.385	0.173
C	4.239***	0.969	4.376	0.000
ECM	-0.176***	0.040	-4.362	0.000

Source: Authors' own compilation.
Notes: (i) ** and *** denote 5% and 1% significant levels, respectively; (ii) Δ=first difference operator.

The long-run regression results show that the key macroeconomic driver of stock market development is trade openness. The results show that coefficient of trade openness is negative and statistically significant. In particular, a percentage increase in the trade openness hurts stock market development by approximately 2.336 per cent in the long run. Such negative relationship can be explained by the comparative advantage in trade of the Philippines. According to Do and Levchenko (2007), the level of financial development, including stock market development, can be affected by the comparative advantage in trade of a country. They demonstrate that the comparative advantage in trade will affect the production pattern of a country, and hence the demand for external finance. In particular, countries that mainly export goods which do not heavily rely on external finance will experience a slower pace of financial development. In the case of the Philippines, the main exports have been the electrical components and equipment since the 1970s. In 2014, these sectors accounted for 47 per cent of the

total exports of the country (see Frederick and Gereffi 2016). However, these sectors only accounted for 0.3 per cent of the total market capitalisation in the PSE in 2014 (PSE 2014). It is evident that these sectors have not been heavily relied on external finance through the stock market. In addition, the negative relationship between trade openness and stock market development is also found in other studies such as Jin (2006), Baltagi et al. (2009), and Kim et al. (2011).

In addition, the short-run regression results show that the key macroeconomic drivers of stock market development are the banking sector development and the exchange rate. Regarding the impact of banking sector development, a percentage increase in banking sector development promotes stock market development by 1.104 per cent in the short run. Despite the coefficients of banking sector development in the long-run results is not statistically significant, the coefficients of both long and short-run results are positive, showing positive impact of banking sector development on stock market growth. In fact, the argument of positive association between the banking sector and stock market is well documented both theoretically (see, for example, Merton and Bodie 1995; 2004; Levine 1997; 2005) and empirically (see Garcia and Liu 1999; Yartey 2007; 2010; El-Nader and Alraimony 2013). Concerning the impact of exchange rate, the short-run results shows that it exhibits positive and significant impacts on stock market development at different lags. In particular, a percentage increase in the current level of exchange rate benefits stock market development by approximately 1.440 per cent in the short run. In addition, the results show that a percentage increase in the second lag of exchange rate also benefits stock market development by approximately 1.303 per cent in the short run. The positive relationship between the exchange rate and stock market performance is also found in the studies such as Ma and Kao (1990) and Phylaktis and Ravazzolo (2005).

Furthermore, the results show that the coefficient of the error correction term is negative and statistically significant. This implies that, when the variables drift apart from the equilibrium level by 1 per cent in the short run, they correct by 0.176 per cent towards the equilibrium level. Overall, the regression for the underlying ARDL model fits well, as indicated by the adjusted R-squared of 75 per cent. On the diagnostic tests, the result displayed in Table 5 shows that the model passes all the diagnostic tests performed for serial correlation, functional form, normality and heteroscedasticity.

Table 5: Results of diagnostic tests

Test	**Statistic**	**P-value**
Serial Correlation: CHSQ(2)	1.178	0.555
Functional Form: F(1,43)	1.555	0.219
Normality: CHSQ (2)	0.735	0.693
Heteroscedasticity: CHSQ (1)	0.360	0.549

Source: Authors' own compilation.

Figure A.1 (a) and (b) in the Appendix shows the plot of the cumulative sum of recursive residual (CUSUM) and the cumulative sum of squares of recursive residual (CUSUMSQ) of the model, respectively. The reported CUSUM and CUSUMSQ show that the model is stable and confirm the stability of the long-run coefficients of regressors in the study.

6. Conclusion

This paper examined the macroeconomic drivers of stock market development in the Philippines. It shed some light on the following question: What are the key macroeconomic drivers of the sustainable and rapid growth of the Philippine stock market in recent decades? The Philippine stock market has experienced phenomenal growth over the years. Measured by the share price index, the PSEi increased from 1 869 points in 1997 to 7 230 points in 2014. The growth momentum was shown by the consecutive growth of the PSEi during the period of 2009 to 2014, with a cumulative growth of 286 per cent in these six consecutive years. In addition, measured by the market capitalisation ratio, the global ranking of the PSE improved from 55th in 2005 to 12th in 2014. Despite the remarkable growth of the Philippines stock market, there is no similar study examining the drivers of these impressive performance. Therefore, this paper enriched the existing literature by investigating the macroeconomic drivers of stock market development in the Philippines during the period 2001Q4 to 2016Q4 using the ARDL bounds testing procedure. The results found that trade openness had negative impact on the development of stock market in the long run, whereas the bank sector development, and exchange rate had positive impacts in the short run. Based on the findings, it is imperative for policymakers of the country to promote the use of equity financing in the production of main exports. Such policy will benefit the long term development of stock market by increasing

the demand of equity financing from those exporting industries. In addition, it is important for the policymakers to pursue policy that promote banking sector development, so as to foster the short term development of stock market. Finally, policymakers of the country should strive to maintain the stability of its domestic currency in order to promote the growth of stock market development in the short run.

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Appendix

Figure A.1(a): The plot of the cumulative sum of recursive residuals

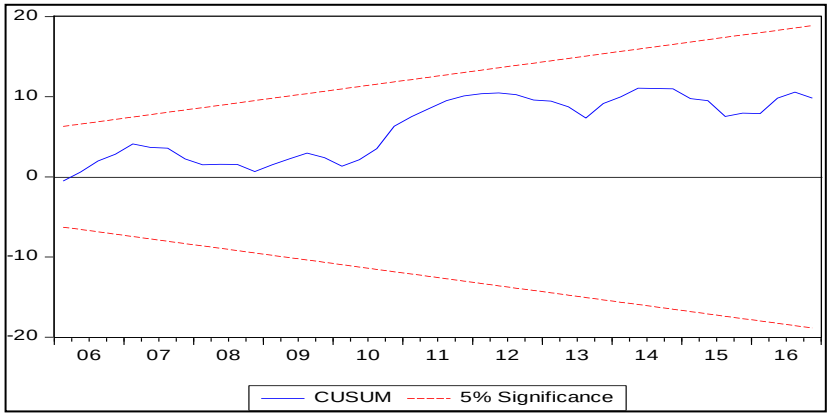
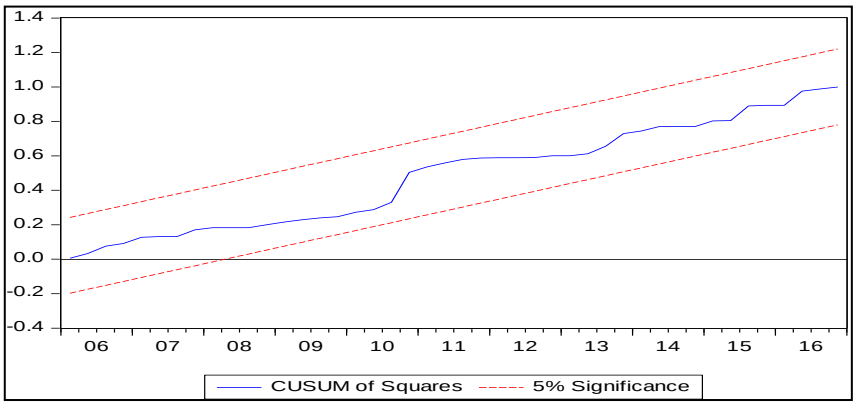


Figure A.1(b): The plot of the cumulative sum of squares of recursive residuals



Source: Authors' own compilation
Note: The straight lines represent critical bounds at 5% significant level.