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**| RESEARCH ARTICLE**

**The Influence of ASEAN Bond Market Integration in the Philippines' Inflationary Pressures, Credit Expansions, and its Challenges**

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**| ABSTRACT**

Bond markets have grown mature in many countries; however, the quality of financial integration varies across ASEAN economies. In the case of bond markets in the ASEAN +3, they experienced fast development; however, they are still less integrated. This study attempts to examine the ramifications of the ASEAN bond market integration and past crises to the Philippines' inflation, credit, and growth and identify what impedes the development of the bond market for the period of 1992 to 2017. The study also aims to have a more in-depth analysis on preventing rises from happening and controlling both credit expansions and inflationary pressures. The Ordinary Least Square method (OLS) was used to examine the relationship of inflation, credit, bond market index, real interest rate, and integration to the Philippines' growth. This led to this paper providing empirical insights that credit has a significant positive relationship with GDP growth; while, inflation has a significant negative relationship with GDP growth. However, the bond market index and integration showed insignificant negative results. This study provides possible reasons for the said conclusion and suggests ways not only to develop and grow the debt market in the Philippines but also to sustain long-run economic stability and growth to become on par with other ASEAN economies.

**| KEYWORDS**

ASEAN Bond Market Integration, inflationary pressure, credit expansions, long-run economic growth

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**1. Introduction**

On August 8 in 1967, the Association of Southeast Asian Nations (ASEAN) was formed under the supervision and declaration of Bangkok, Thailand, with its founding fathers, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand. On the 30th of April 1999, the ASEAN that we now know today as was complete, comprising ten (10) members in total. The ASEAN's aims and purposes were presented in the ASEAN Declaration. To condense all seven aims, ASEAN planned to enhance the cooperation and assistance of the ten members, to have stable and peaceful communities in their economic growth, social progress, cultural development, technical, scientific, and administrative fields by following the upholding of justice and the rule of law in the relationship between the countries whilst adhering to the values of the Charter of the United Nations; to promote cooperation in economic, political, and security.

The launch of the ASEAN Economic Community (AEC) in 2015 symbolized the beginning of the journey of all ten members and served as a milestone in the region's economic integration ("ASEAN Integration Report", 2019). Aguba, Cruz, Guzman, Mangahas, and Realon (2017) described the AEC as "the heart of the integration", which exemplified ASEAN's primary objective, to change and develop the member state's economic conditions and join the competitive global market. AECs vision was anticipated to be a multi-year process in which regional economies developed, conforming to their own progress. Responding to the liberalization of financial services and capital accounts depending on a country's readiness was labeled the "ASEAN WAY" (Hanna, Khor & Ali, 2019). According to Hanna et al. (2019), an economy's "readiness" revolved around policy frameworks, institutions, safeguards, and favorable financial and economic conditions.

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The AEC or ASEAN Economic Community Blueprint mentioned that the financial services sector measured by liberalization would enable members to ensure their maintenance and development of finances. ASEAN Policy Blueprint for SME development for 2004 to 2014 objectives for the development of small and medium enterprises (SME) development included increasing competition and enhancing the diversities of ASEAN members despite differences and improvement in facilities such as human resource development, technology, and other facilities that would be needed in SME development. Another objective for SME development was to increase its contribution to overall growth and development for the ASEAN region and limit SMEs' vulnerability to economic and financial crises while also overcoming the challenges of liberalized trading (Association of Southeast Asian Nations, 2008).

In effect of the AEC's launch, there have been significant improvements made in Asia's financial systems in the last few years. From market-based only financial systems to also providing financial services and competing with financial intermediaries like banks. Through financial innovations, it changed how funds are distributed. "The debt market showed promising prospects" (Mandigma, 2015). Although it is noteworthy that bond markets specifically have been growing immensely in Asia's emerging countries, financial integration has lagged behind trade integration, especially in Indonesia, Malaysia, Thailand, and the Philippines (Wihardja, 2013). According to Ehigiamusoe and Lean (2018), economic integration served as a catalyst for economic growth through the growth of productivity, accumulation of capital, and the integration of trade and finance. Macroeconomic goals of the ASEAN financial integration include protecting markets from movements brought about by the capital flight and guaranteeing stability (Vinokurov, 2017). However, the strength of association between financial integration and economic growth depended on several factors such as human capital, quality of the institution, macroeconomic framework, and many more (Ehigiamusoe & Lean, 2018).

Shimizu (2014) enumerated some benefits of the integration for market participants: first, the diversification of investment targets, better financial products and services, and lower transaction costs thanks to competition among intermediaries are the potential benefits for investors. Second, as for benefits for intermediaries, lower service provision costs by economies of scale and scope, and an expanded investor base. Third, due to the harmonization of regulations and other systems, there will be a benefit for issuers because of lower securities authorities. Fourth, as the integration process is advanced, the regulatory authorities would benefit from the development of appropriate regulations for cross-border transactions. Robiyanto and Ernayani (2018) also mentioned that financial integration would provide positive outcomes and improvements in the growth of developing ASEAN countries in financial sectors (Suganda & Soetrisno, 2016; Suryanta, 2011 as cited in Robiyanto & Ernayani, 2018).

This study examines the importance of the ASEAN integration in the Philippines, specifically on bond market integration. Additionally, this study examines if the inflationary pressures and credit expansions caused by bond market integration were experienced in the Philippines, and if so, were they beneficial and could they stimulate economic growth for the Philippines. Lastly, this helps to have a deeper understanding of the situation of bond markets in their country. In this respect, this study makes a fundamental contribution to the financial integration and economic growth in the Philippines' literature. This study determines if the bond market plays an essential role in the Philippines' development, and if it does, what are the changes that the country needs to do to further utilize its position in the ASEAN bond market integration. The findings of this study could redound to policymakers and key government agencies in designing proper and feasible actions (limited to inflation and credit control), which could ultimately lead to a more robust bond market in the Philippines. Lastly, to future researchers, this study merits them as the findings of this study could be more informative to them being focused on the Philippines economy regarding the ASEAN integration and the bond market.

In consequence, the aims of this study are (i) Examining the relationship of ASEAN's bond market integration on the Philippines' inflationary pressures and credit expansions and on the economy (ii) Analyzing how to control inflationary pressures and credit expansion in the Philippines caused by the ASEAN bond market integration.

This study contributes to relevant literature by reviewing the changes in the Philippines' output brought about by the ASEAN bond market integration, followed by the discussion of the implication of government policies in ASEAN bond market integration, observing the fluctuation of inflation and credit movement in the Philippines during the ASEAN bond market integration, and lastly, identifying factors that affect the weakness of the ASEAN bond market integration in the Philippines. Throughout the financial literature, it is already known that there are linkages between a developed financial market in a country and economic growth. However, it is still an argument whether a developed financial market is important in achieving economic growth (Pradhan et al., 2018). This study focuses on the bond market integration, which fits into the broader literature on financial integration (Vinokurov, 2017; Ehigiamusoe and Lean, 2018; Taningco, 2018; Pongsaparan et al., 2011; Rillo, 2018; Shimizu, 2018; Hanna et al., 2019; Baron and Xiong, 2014; Yu et al., 2007; Mandigma, 2014). Several journals about financial development focused on the overall perspective, developing the financial market itself, rather than going into the specifics (such as bond market and stock market). The literature on bond market development vis-à-vis economic growth is also insufficient. For instance, Yu et al. (2007) findings suggested that there was minimal development in Asia bond market integration. While their study did contribute to the inspiration for this study, their study, however, only proposed some ways to help facilitate growth in developing the integrations focusing on

administrative remedies. Ehigiatusoe and Lean (2018) recommended using new perspectives with new approaches in developing financial integration instead of relying on traditional ones while also taking into account other variables. Shimizu (2014) reported that there were substantial discrepancies among the level of progress of financial systems in ASEAN economies. Though some economies did have the same development level, dissimilarities between financial institutions, policies implemented, and market size shouldn't be ignored as disparities in financial development could also be significantly influenced by stock and bond market sizes (ADB, 2013). Additionally, the priorities of each country should be kept in mind, as some may prioritize integration within the region, some may also want to establish links outside the region (Shimizu, 2014). These said studies were generally motivated by an interest in financial integration, developing it, and what policies should be implemented.

## 2. Literature Review

With economic integration, an economy has the capability to increase productivity, facilitate capital accumulation, and eventually encourage growth. Integration utilizes its influence in promoting growth through several potential channels such as price transparency, opening up the economy, thereby endorsing international trade, good institutions, a stable and stronger macroeconomy, single market exploitation, deduction of exchange rates volatility, efficient resource allocation, risk diversification and, financial integration and development (Conti, 2014, as cited in Ehigiatusoe and Lean., 2018 and Hanna et al., 2019). Improving the development of economic growth can be done through Research and Development (R&D) and foreign direct investment (FDI) by means of economic integration. Atjie and Titheruw (2016) argued that FDI depends on the level of development of local financial markets. The authors also mentioned that foreign direct investment (FDI) represented a significant role in the development of economic growth, and countries who belong in developing financial markets will benefit more from FDI. A capital market must achieve a stage of progress before it could be successful in foreign investment and promoting investment, and it takes a lot of years to achieve efficiency (Alfaro et al., 2008, Kose et al., 2006 and, Prasad and Rajan, 2008 as cited in Atjie and Titheruw, 2016). According to Rillo (2018), capital account liberalization was designed to be preceded by distinguishing and evaluating regulations with respect to portfolio investment, current account, foreign direct investment, and other kinds of capital inflows.

Since the Asian financial crisis, being caused by double mismatches, ASEAN countries had accumulated domestic savings. ASEAN countries acquired huge foreign reserves (mostly in the form of US securities) while receiving portfolio and domestic investments to finance domestic firms since most savings flowed overseas (especially to the United States) before flowing back to Asian countries. This then brought about the issue that the region's huge intraregional savings had not been utilized for intraregional investments (Kumamoto and Zhuo, 2020). Rillo (2018) tested the degree of integration in ASEAN financial markets based on the trends of the portfolio, bank claims, and direct investments. In ASEAN countries, the total cross-border assets increased by 27%, from USD 11.4 trillion in 2010 to USD 14.5 trillion in 2014. These assets were dominated by bank claims of USD 4.1 trillion, debt assets USD 3.5 trillion, portfolio equity assets USD 3.2 trillion, and stock of outward foreign direct investment USD 3.6 trillion. Evidently, intra-regional shares of cross-border assets had increased, implying that there's clear evidence for a gradual financial integration; however, most of the asset holdings were still being directed to the rest of the world (which means that there's limited financial integration). In 2014, cross-border liabilities of USD 3.7 trillion exceeded cross-border assets of USD 2.7 trillion. Despite the findings suggesting that ASEAN was an attractive investment destination, Rillo (2018) argued that the region's financial linkages remain restricted, proven by the insignificant and declining intra-regional shares. According to Kumamoto and Zhuo (2020), during the short run, financial integration assisted in showing the differences of information given by countries in adopting the Pooled Mean Group (PMG) estimation methods in determining government bond spreads. In the long run, public interest payments (being the most important determinant) had significant effects on government bond yields. In the Philippines, public interest payments had significant effects in the short run where public interest payments were higher, and their yields were negatively correlated with their global factor. Furthermore, risk aversion had a positive impact, suggesting "flight to quality." (Kumamoto and Zhuo, 2020).

According to Mercado (2020), the Philippines attracted less FDI and relied less on FDI. This further highlights the need to implement policies and regulations for developing capital allocation (both domestic and foreign) and for controlling more long-term steady inflows. As such, Pongsaparn and Unterberdoester (2011) suggested strengthening the financial infrastructure (as well as for smaller and service-oriented firms which remain credit-constrained), encouraging private-public partnerships (which is necessary for infrastructure investment), and eliminating restrictions on foreign direct investments. According to Pongsaparn and Unterberdoester (2011), greater financial integration could strengthen Asian economies' domestic sources of growth.

There is a vital role for financial integration in Asia in strengthening the domestic source of growth. For instance, reducing financing constraints (that hinders consumption and investment) and increasing accessibility of underserved households could be achieved by promoting competition in sheltered banking systems. Additionally, foreign participation in local currency bond markets was found to provide greater liquidity with lowering yields (Peiris, 2010 as cited in Pongsaparn and Unterberdoester, 2011). Motives for precautionary savings could also be lessened by transmitting financial know-how, which encourages financial innovation. This could be done by broadening the range of savings and insurance instruments of households or providing them with more suitable forms to finance investments (Pongsaparn and Unterberdoester, 2011). According to Pongsaparn and Unterberdoester (2011),

by exposing firms to a broader investor base, greater financial openness tends to be more favorable to developed corporate governance. Moreover, the presence of foreign investors increased the pressure for greater transparency, thus enhancing quality and information frequency, consequently reducing price volatility of financial assets (Preasa and Rajan, 2008 as cited in Pongsaparan and Unteroberdoester, 2011).

Rillo (2018) reported that there was still a significant improvement in Asia's financial integration even though 60% of trade flows in Asia were within the region and 20% of financial transaction flows were directed at the region. According to Rillo (2018), 87% of measures under the AEC Blueprint, which focused on achieving the free flow of services and more unrestricted flow of capital in the finance sector, were completed by the ASEAN countries by the end of 2015. However, ASEAN economies' quantity-based and price-based integration measures tended to be more linked to global financial markets than to their regional neighbors. Regional financial integration was clearly increasing. The author further argued that financial globalization allowed countries to benefit from the extra savings created by financial flows, resulting in increased expenditure and capital accumulation. However, it provided challenges and risks which exposed it to financial market uncertainties. Furthermore, it also permitted greater diversification, increasing the external shocks and deepening the financial market (Rillo, 2018).

### **2.1 Financial Integration**

Kumamoto and Zhuo (2020) defined a *financially integrated market* as the market whom which had fully integrated financial services and instruments that have the following characteristics: first, when all participants follow the same set of regulations when dealing with financial services; second, if they all have balanced accessibility to such; and lastly, if they all are managed uniformly in the market. According to Robiyanto and Ernayani (2018), an economy should have three characteristics in the market to be considered integrated between financial service and market instruments when prospective parties have common characteristics are the following: first, as they are about to perform the specific financial services, they are executed with a single set of rules. Second, establishing fair access to financial services. Lastly, people in the market should be treated equally (Baele et al., 2004 as cited in Robiyanto & Ernayani, 2018).

According to Vinokurov (2017), the financial integration between the ASEAN members only evolves within four domains: the banking sector, liberalizing capital flows (mainly bonds), liberalizing foreign direct investments within the union, and securing regional financial stability. The bond markets in Asia had experienced some remarkable developments, albeit slow. Regional initiatives like the ASEAN Capital Market Forum (ACMF), Asian Bond Market Initiative (ABMI), and ASEAN Bond Market Forum were established to support and expedite the development of bond markets (Mandigma, 2014). Undoubtedly, financial integration had its economic benefits, such as global rebalancing, which could motivate competition and increase access to finance, diminishing constraints, increasing consumption and investments (Pongsaparn and Unteroberdoerster, as cited in Wihardja, 2013). Yet, progress has been limited (Vinokurov, 2017). "While the bond markets are growing rapidly, intra-regional financial flows are still comparatively small", as stated by Mandigma (2014). In agreement with Atje and Titiheruw (2016), four stages of financial deepening were described by Hervé Hannoun, namely: (1) establishing financial intermediaries like banks that deal with asymmetric information, (2) developing the stock market by establishing "arm's length" relationship between investors and firms, (3) improving the fixed income markets, and (4) transforming the derivatives market and securitization. It is safe to say that the Philippines is merely halfway through Hervé's stages of development. The neoclassical theory explained how financial integration could stimulate growth in developing countries. "Flowing" excess capital to economies that suffer from capital shortage and offering higher returns could stimulate capital growth and generate long-run economic growth. However, this still depended on the ability to speed up the physical and human accumulation, which creates spill-over effects on technological progress (Vinokurov, 2017). Financial integration plays a key role in the developmental process and stimulating growth. It has the capability to promote specialization, encourage capital allocation, international risk-sharing, and economic growth (Acemoglu & Zilibotti, 1997; Gehringer, 2015; Obstfeld, 1994; Saafi et al., 2016, as cited in Ehigiamusoe and Lean, 2018). However, as Vinokurov (2017) said, until now, there's still no recognized clear proof about the neoclassical theory's accuracy. According to Vinokurov (2017), a *financial trilemma* where the convergence of national financial policy objectives, financial integration, and stability is impossible, as they are contradictory. Financial markets and intermediaries should be controlled by a "supranational body" if there is such a trilemma.

Financial services liberalization was explained by the Asian Development Bank in terms of three (3) elements. First, other countries in the region would allow banks from ASEAN countries to operate based on the QAB framework. Banks would have guidelines to follow and standards to be qualified to enter the region. Second, there would be equal treatment with the banks entering and local banks. Third, member countries should have harmonized bank regulations. Each country would develop financial infrastructures such as interbank markets, credit guarantee facilities, and rating agencies. The facilitation of regional financial integration requires the liberalization of capital transactions, further development of cross-border investment products, and modification or harmonization of regulations and systems were examples of measurements to promote integration; individual markets should also be strengthened. Comparing ASEAN with other associations like the EAEU (Eurasian Economic Union), ASEAN member states are more likely to benefit from financial integration expansion (Vinokurov, 2017). With over 40 years of history, the

Association of Southeast Asian Nations (ASEAN), consisting of ten diverse countries, had only become stronger after the crisis happened in 1997 (Asian financial crisis) and 2008 (global financial crisis). This could be attributed to the impressive foundation of micro-and macro-prudential regulations, which generated the members' and markets' stability during the crisis (Shimada and Yang, 2010, as cited in Mandigma, 2014) and to the liberalization of foreign exchange transactions, stimulation of capital movement, bank deregulation, and innovations of technology (Mensah and Premaratne, 2018). However, some sources said otherwise. According to Atje and Titiheruw (2016), there were mismatches of currencies and maturities in the affected regions. Such mismatches happen when residents have assets in the local currency but liabilities in foreign currencies. Sobrun and Turner (2015) also argued that mismatches in developing bond markets would often be left "unhedged or imperfectly unhedged". In order for people to have enough money in local currency investments, the borrowing rate of foreign currency was increased. Consequently, this would cause an increased rate of currency mismatches. Unfortunately, this was the case in most Asian countries. Firms and intermediaries who had liabilities (mostly in dollars) possessed more short-term liabilities than their assets (Atje and Titiheruw, 2016). Atje and Titiheruw (2016) also argued that the huge adjustments in exchange rates brought a shock to the economy that a large number of liabilities in foreign currencies weren't able to shield the economy from. Additionally, according to Mandigma (2014), Asian bond markets presented strong long-term interdependencies while having low degrees of integration, which suggests markets operating independently of each other (Johansson, 2008; Vo, 2009 as cited in Mandigma, 2014). While government bond markets in the ASEAN region were dependent on a common regional factor; correlations, however, had not increased. This indicates that countries involved were indeed integrated, yet integration has not intensified. The interrelated relationship between liquidity risk and credit risk, wherein an increase in credit risk leads to higher public debt and budget deficits while reducing liquidity risk, tends to increase government bond supply (Kumamoto and Zhuo, 2020). Yu et al. (2007) mentioned that bond market integration has limited progress in the ASEAN region. Their findings suggested that when using cross-border bond investment shares of regions as a measurement for capital market integration, Asian countries had a significantly smaller share than in Europe (Chu et al., 2006 as cited in Yu et al., 2007).

Turner (n.d.) enumerated reasons why debt markets should be developed: first, generating market interest rates that reflect the opportunity costs of funds at each maturity made financial markets more complete; the existence of tradable instruments also helps risk management. Second, developing bond markets could also avoid focusing intermediation solely on banks. Damages caused by a crisis could be difficult to reconstruct without the presence of a well-functioning bond market. Third, developing bond markets could help with the operation of monetary policy. For smooth implementation of policy, an efficient money market was essential since monetary policies depended on indirect control instruments. Additionally, long-term bond prices also gave important expectations of macroeconomic developments and how the market would react to changes in monetary policy. According to Turner (n.d.), central banks' main objective was to stabilize prices by setting short-term rates overnight that were appropriate for the market conditions. Long-term rates were then to be determined by the market without the intervention of central banks. However, some central banks also had other responsibilities that necessitated them to pursue bond market-related objectives, such as managing government debt. Turner (n.d.) argued that a debt manager would usually want to reduce the interest rates that were paid on the government debt. However, this objective may conflict with the other objective, setting interest rates to achieve price stability and sales deficit in government debt (which can cause more problems for monetary policies). These dilemmas led to other countries' decisions to change the system, where authorities would set the number of government securities they wanted to sell, price and interest rates would then be set by the market. This arrangement would be ideal because it would control government expenses (since their financing needs will impinge interest rates) and guarantee budget financing would not impact financial conditions in such a way that would undermine the monetary policy. Another concern, in relation to emerging markets, was their local market's vulnerability to international capital markets. This led to the debate that preventing susceptibility increases the underlying demand for bonds, and banks (who are highly exposed to interest risks) would be more willing to hold bonds when they were assured that the fluctuation of bond prices could be lessened with the intervention of central banks. Contrasting opinion, however, said that central banks' intervention could only "featherbed" (p.9) the banks since they would have less incentive for proper risk management, which could hinder market development of hedging instruments.

Financial integration could also be an advantage even during a crisis. According to Rillo (2018), ASEAN economies were able to gather a huge amount of foreign reserves even though there was an Asian financial crisis. A huge trade flow support in the region could be attributed to the continued pouring of foreign capital through foreign direct and portfolio investments. As local currency-denominated bonds increased across the region, this was noticeable that Asian financial markets have developed. Indeed, financial integration does have several positive impacts on the economy (e.g., risk diversification, efficient resource allocation, serving as a catalyst for growth and a block from financial crises, etc.). Removal of investment restrictions consequently improving the sharing of risks across national borders is considered as a huge advantage (Gourinchas & Jeanne, 2006; Obstfeld, 1994; Wright, 2005; and Bekaert, Harvey, & Lundblad, 2006, as cited in Mensah and Premaratne, 2018), though it was still considered debatable if it was successful in developing countries. For instance, Yu et al. (2007) found that the development of bond market integration in Asia was very restricted. Rillo (2018) blamed the slow growth in Asian financial integration on strict policies and regulations. According to Shimizu (2014), foreign banks were being discriminated against and restricted by the ASEAN countries to protect their local

banks. After the Asian financial crisis, attention was shifted to capital market efficiencies. Restrictions were relaxed to have restructuring and rehabilitation for the foreign capital. However, these restrictions were brought back to limit the participation of the foreign banks to strengthen the local banks. According to Rillo (2018), IMF claimed that in Asia, and especially among ASEAN economies, the trade-offs between the benefits of risk-sharing and the risks of contagion from greater financial inclusion were less desirable than in advanced markets, which confirmed previous reports about the reasons for ASEAN's slow financial integration (Rillo, 2018). Yu et al. (2007) suggested that pursuing policy coordination through liberalization and international forces might accelerate the integration of bond markets. Prioritizing the domestic bond markets can be done by encouraging retail investment, attracting foreign investments, developing the market infrastructures, and establishing local currency bond markets to foreign financial institutions. All of which could set the stage for a better bond market integration. While there are several research journals studying the reaction of ASEAN member states vis-à-vis economic and financial integration, none of them, however, focused on the Philippines alone, at least limited to the researchers' knowledge. The relatively small number of literature regarding the Philippines' role, gains, and endeavors in the ASEAN bond market integration merit the conduct of this study.

## **2.2 Integration to Credit**

As stated by Nasir (2019), financial development and economic growth are *two sides of a coin* (Borio, 2011; Nasir et al., 2015 as cited in Nasir et al., 2019). However, history dictates that too much of anything is not good. The Global Financial Crisis was caused due to the sudden credit boom. Credit expansion could either serve as a catalyst for growth or destruction. According to Dong and Xu (2019), intensive and excessive credit expansions could provoke chronic recessions. The authors pinpointed the cause of such catastrophes because of the misallocations of credit and the surge of productivity growth which later falls eventually (Gordon and Ordoñez, 2016 as cited in Dong and Xu, 2019).

As mentioned by Angeles (2015), credit to the private sector is one of the "most reliable predictors" (p. 2) that encourages and can stimulate growth. The author discussed that credit to the private sector is composed of two separate entities: firms and households. It is to be noted the distinction between the two not only lies in budget, behavior, and intentions but also in the way they use credit (Angeles, 2015). According to Angeles (2015), while growth from credit could be attributed to excessive credit to firms, excessive credit to households, on the other hand, could be followed by credit expansion tendencies which would cause crises to start. Furthermore, Dong and Xu specified two types of firms: firms from a high-productivity sector (heterogeneous productivity) and firms from a low-productivity sector (homogeneous productivity). *Within-sector misallocation* was a term used by the authors to describe the existence of heterogeneous productivity that evaluated whether a sector was efficient, thus determined in cases of credit misallocations. The presence of within-sector misallocation could create spillover effects on the aggregate output caused by the intensive credit expansion, thus creating a financial crisis.

According to Boudias (2015), emerging market economies have weak and volatile capital inflows, partly driven by global factors, leaving them more prone to casualties (Ghosh et al., 2014 as cited in Boudias, 2015). Boudias (2015) argued that with financial integration and liberalization, emerging market economies (EMEs) did experience an increase in loan-to-deposit ratios, which created higher dependence on external funding, thereby accelerating credit growth and creating stronger domestic banking systems (Committee on the Global Financial System, 2009, as cited in Boudias, 2014).

The history of economic crises served as a lesson to many. Some even use them as a guide to establishing an effective operating economy. An article by the European Central Bank (2012) used them to benchmark and analyzed the concurrent patterns to credit and money during such dreadful times. According to the European Central Bank (ECB, 2012), there are different types of recessions: those who collaborated with the financial crisis and those who did not. Whatever the cause may be, either being caused by external shocks or domestic economic policy mistakes can generate output and welfare losses (IMF, 2018, as cited in Bangko Sentral ng Pilipinas, 2019). The Great Depression, a name earned alongside the dilemma it caused to several nations, accompanied the banking crisis that was also happening during these times that lasted for three and a half years. The European economy reacted to such by decreasing credit growth while bursting asset bubbles not just in European countries but also in other developed countries, affecting money and credit growth as a consequence. Credit growth became positive only three years after the Great Depression ended. According to the ECB (2012), various factors influenced this. First, given the history of what happened during the Great Depression, the reaction of credit can be attributed to the decrease in aggregate demand and output. Second, because of the Great Depression, many banks were left with no choice but to shut down, leaving only 50% of the pre-Depression banks operating. The mass closure of banks leads to the banks' supply constraint on restoring borrowers' stock of information. Third, the change in banks' behavior, being more risk-averse, increasing the reserve-to-debt ratios, thereby being more liquid, and accumulated more liquid assets like Treasury bills. Consequently, lesser banks have available funds to lend to illiquid, long-term credit to people. Lastly, demand for credit could also occur since debt ratios were lower than pre-crisis (European Central Bank, 2012).

Because of the chaos caused by Asia and the Global Financial Crisis, banking sectors took action in the way of mergers and privatization. As a result, assets held by state banks fell from 23% (from 1995) to 13% (in 2008). Even so, due to liberalization and globalization, foreign banks-held assets quadrupled from 8% to 30% (Cull et al., 2017, as cited in Hamid, 2019). According to Hamid (2019), the cross-border banking sector has been significantly developing and is considered a major beneficiary, albeit the trade integration was advancing faster than the financial integration. The McKinsey Global Institute (MGI) even reported the ASEAN nations to be one of the world's "outperforming emerging" economies that forecasts long-term positive growth (Das & Lin, 2018 as cited in Nasir et al., 2019); making it a powerful economic block after the Global Financial Crisis. Even though ASEAN integration has much developed, joining with other associations, there is still barely any recognition in Asian emerging markets (Anh, 2020). The limited literature on the ASEAN banking integration and credit expansion could attest to this fact. Not much is known of the relationship between financial integration and the role of bank credit in the Philippines' growth. This study attempts to fill the gap between bond market integration, credit expansion, and growth, concentrating on the Philippines alone.

### **2.3 Integration to Inflation**

Ajuzie, Edoho, Kang, Uwakonye, and Keleta (2008) defined inflation as a "monetary phenomenon" by which was caused by two occurrences: first, a sudden increase in the supply of money in the economy, and second, when consumers are bidding up on goods and services that have limited supply, thereby aggregate demand is greater than supply, which causes the increase in prices. Both of which could lead to more demand, higher consumption, and spending, thus increasing output. However, according to Gillman et al. (2001), there was an existing significant negative relationship between inflation and growth. Whenever inflation rises, it could lead to a decrease in economic growth; the indirect relationship of inflation in growth is so forceful that alternative monetary policies couldn't be reversed (Gillman et al., 2001). Some may accuse the failure of policy implementations because of their ineffectiveness. As cited by Pham et al. (2020), monetary authorities' role in controlling capital flows, managing stability while sustaining growth became more significant, especially after the global financial crisis. The relevance of inflation in economics is no surprise as it could influence decision-making and is fundamental for regulating monetary policies, making it a primary mechanism not just in policies but also in growth (Cecchetti, 2009; Gillman et al., 2001).

According to James (2020), the Federal Reserve Board's interest rate decisions would affect the market valuation of bonds. Interest rates and bond yields increased when the Federal Reserve Board increased the target interest rate. This is because bond issuers would provide a reasonable interest rate to entice buyers to purchase their bonds. Present bonds with lower interest rates are less expensive as new bonds with higher interest rates are issued. In effect, in the long run, bonds would see the greatest effect on price changes, while during the short run, there is an effect of any Fed action almost immediately.

In the Philippines, Asia Bond Monitor (2017) reported in 2017 that the rise in the yields of most long-tenor bonds and decline in short-tenor bonds implies that market participants were aware and were vigilant of the expected interest hike from the US Fed during December 2017. This indicated that small economies, such as the Philippines, are left vulnerable when large economies (in this case, the US) adjust their rates. Small economies would then be left with the dilemma of keeping yields competitive by adjusting interest rates is worth its impact on inflation. In the Philippines' case, the Bangko Sentral ng Pilipinas was able to keep the overnight reverse repurchase interest rate at 3%. Expectations remained anchored with the government's target of 2% - 4%, and inflation remained manageable. For more details on the Philippines' market summary for 2017, see Section 2.4.2.

One might think that the very presence of the bond market, especially with the existence of bond vigilantes, could help markets keep inflation low and stable. According to Rose (2014), a powerful constituency for low inflation could be created by issuing bonds to the rich instead of money to the poor. The author argued that using seigniorage to finance government expenses is regressive since making money causes inflation tax paid more by the poor than the rich. We must bear in mind the differences between the behaviors of different income levels. Low-income earners tend to hold more money than high-income earners who tend to hold more assets than earn interests or are protected from inflation (Rose, 2014). The argument of the collection action suggested that the consequences of inflation were more concentrated: inflation taxes are borne more by the rich (bond-holders) than the poor (money-holders). Furthermore, this implied that measures for anti-inflation were more likely to be pursued and that the free-rider problem was reduced. Rose (2014) found that the presence of long maturity, nominal bonds denominated in local currency could decrease inflation by three to four percentage points for countries that have inflation-targeting regimes. Still, other monetary regimes like maintaining fixed exchange rates have different effects. According to Pham et al. (2020), even inflation-targeting countries were still affected by shocks in exchange rates, leading to significant changes in inflation. One of the major determinants of inflation in the ASEAN-5 economies is the oil price shocks. Pham et al. (2020) further argued that a contractionary monetary policy might not be a proper tool to control said oil shocks. Instead, an accommodative expansionary monetary policy could be an alternative as it doesn't give rise to substantial risks in relation to price stability for the ASEAN-5 economies (Pham et al., 2020).

Having low inflation rates could make the domestic-currency debt more attractive to investors in many countries. Findings also suggested that lower inflation was associated with longer average maturities of government bonds. One might think that integrating bond markets with other economies would be a gain for every country without a doubt. However, Kumamoto and Zhuo (2020) argued that government bond market integration could extinguish the market's willingness to analyze the national fiscal policies' creditworthiness. According to the authors, government bond market discipline would only lead to pricing government bonds (with unsound fiscal policies) that compensate for the higher default risk from offering a higher yield. The higher interest burden reflects the negative evaluation, thus encouraging governments to strengthen the fiscal policies. Developing and disciplining a market could be done with an accurate evaluation of the risk-return profile of government bonds. Even so, regardless of the differences in fiscal policies' soundness, if government bond yields "commoved" together (p. 291), integration could hinder market discipline (Kumamoto and Zhuo, 2020).

While financial integration does have its benefits since it could encourage trade and increase international capital flows and cross-border investments, developing economies could still be affected by globalization's impact on inflation and economic growth (Pham et al., 2020). The magnitude of the nexus between globalization and inflation has caused policymakers to shift their attention. Galí (2010) cited channels through which globalization have an everlasting impact on inflation: an increase in competition brought by globalization consequently decreases the inflation bias and "opportunistic disinflation" possibility during positive times in international prices (Rogoff, 2003; Orphanides and Wilcoz, 2002 as cited in Galí, 2010). The Galí-Monacelli model is considered a more updated version of the New Keynesian Model of an open economy. The model has two assumptions: (i) a small open economy with a small role in the world economy and (ii) having a global level of the securities market in a complete market. According to Galí (2010), with the first assumption, all firms (international and domestic) would freely set their respective prices in their currency, which the author called "*producer currency pricing*". The second assumption entails consumers having the freedom to distribute their consumption risks globally. Together, it generates a solid relationship between the small open economy with the entire world, thereby making the role of global externalities more dominant in impacted domestic inflation (Galí, 2010). Thus, making an open economy more vulnerable.

The challenge here lies with the policymakers and central banks. According to Hanna et al. (2019), in terms of the critical challenges for the policymakers, it should be dynamic and resilient for the design and implement policies that support the integrated financial system. Bundick and Smith (2018) findings suggested that there's significant evidence about following the adoption of the inflation target since inflation compensation reacts less to economic news on inflation. Bundick and Smith (2018) showed that "anchoring" inflation expectations, in the long run, has its benefits and should contribute to economic outcomes (Woodford 2003 as cited in Bundick and Smith, 2018). Establishing expectations grants central banks the upper hand, allowing them to calculate their response to cyclical fluctuations while still containing inflation, which is the most crucial task (Bundick and Smith, 2018; Pham et al., 2020). In 2012, the Federal Open Market Committee (FOMC) enacted such a policy; results show that anchoring long-term inflation expectations did reduce the United States' responsiveness to inflation shocks. However, it is important to note that the researchers also found insignificant results in the Bank of Japan's case (which implemented the policy in 2013) by just disclosing a numerical inflation target since bond prices, in the long run, are less sensitive to inflationary shocks. Bundick and Smith (2018) suggested analyzing how bond markets react to monetary policies by observing far forward nominal compensation's response to inflation. Nevertheless, establishing inflation expectations is still beneficial as it also has associations with bond yields.

Anchoring inflation is one of the main reasons for inflation targeting; however, Cecchetti (2009) questions if this is the case. Cecchetti (2009) specified three points to his argument. First, measured inflation expectations through bond yields in developed economies, findings suggested that long-term inflation expectations respond to news in the United States. On the other hand, Canada and Sweden do not (Gürkaynak et al., 2006, 2007 as cited in Cecchetti, 2009). Second, in the United Kingdom prior to 1997, inflation targeting anchors expectations, which then responded to news; but soon became unassociated to news after 1997 (Gürkaynak et al., 2006 as cited in Cecchetti, 2009). Lastly, a study by the Fed finds that lagged inflation in developed economies is correlated with expectations of future inflation in countries that don't target inflation, unlike in countries that do target inflation (Levin et al., 2004 as cited in Cecchetti, 2009).

After a long period of monetary targeting, the Bangko Sentral ng Pilipinas (BSP) started to target inflation in 2002 (Lim 2008 as cited in Pham et al., 2020). According to Cecchetti (2009), the Philippines' inflation expectations seem to be backwards-looking based on past data but persistent, probably caused by "explicit indexation." Cecchetti (2009) also discussed the importance of inflation persistence as it plays a significant role in disinflation. Guinigundo (2016) suggested having a broader inflation target since it can offer more flexibility, protect the credibility of the inflation-targeting framework, and be more coherent with the Philippines' events whilst still coordinating inflation-targeting with monetary policies in other countries (Guinigundo, 2016). With the Philippines being more forward-looking, expected inflation (being more dependent on consumers' and firms' pricing decisions) was harmonizing with BSP's target inflation. Guinigundo (2016) also enumerated other factors that affect expectations in inflation, such as past inflation and its volatility, policy interest rate, industrial production growth, and nominal wage growth.



## **2.4 Philippine Bond Market, Challenges, and Policies**

### **2.4.1 Philippine Bond Market**

According to Ventouri (2018), ASEAN was a fast-growing emerging market, with an average growth rate of 5% in the last decade, compared to the world's average GDP growth rate of 3%. Mandigma (2014) mentioned that financial integration was developing expeditiously; however, intra-regional finance flows were still poor. Bond markets were comparably new in Asia than in other countries, unlike capital and bank markets; however, after the Asian financial crisis, governments in the region were motivated to strengthen financial sectors and promote regional integration to limit vulnerabilities while still providing channels for its excess savings. According to Atje and Titiheruw (2016), while there was significant growth in the primary markets, some of the markets are driven by quasi-government issuers or issuers with credit guarantees. Furthermore, secondary bond markets developed slower. Lack of investor diversity can be attributed to small market size. At the same time, because of withholding taxes and lack of deep markets, global financial intermediaries and foreign investors are discouraged from investing in the region. Hamid (2020) mentioned that the non-members of the ASEAN foreign banks' lending were discovered to hurt the global financial crisis, which primarily emerged in the foreign bank's homelands, lowering the risk tolerance and limiting the liquidity. During crises, foreign banks' role acts as a source of stability in the home country (Arena et al., 2007; Detragiache, Tressel, & Gupta, 2008 as cited in Hamid, 2020).

It should be noted that past financial crises affected the current state of the ASEAN bond markets. Asian financial sectors experienced relatively mild impacts after the global financial crisis, unlike the Asian Financial Crisis. According to Atje & Titiheruw (2016), this implied that: (i) ASEAN's financial institutions have limited exposure to subprime mortgage-related securities, which in turn reflects the relatively low level of financial development, especially among emerging economies like Indonesia. Banks in the region also lack investment activities (e.g., issuing and selling securities) and presence abroad. (ii) improvement of the region's financial institutions. In agreement with Atje and Titiheruw (2016), Mandigma (2014) also mentioned that SEA economies exhibited institutional and business resilience during the global crisis, which they attribute to the successful implementation of micro-and macroprudential regulations that investigated Southeast Asia's financial structures (Shimada and Yang, 2010 as cited in Mandigma, 2014). Integration among ASEAN capital markets was also more robust after the US financial crisis (Karim and Karim, 2012 as cited in Robiyanto and Ernayani, 2018).

After the Asian financial crisis, policymakers recognized the bond market's importance in administering a stable finance source to the corporate sector in the long run while preventing currency and maturity mismatches (Atje & Titiheruw, 2016). Financial cooperation with a focus on developing the bond market in the region has been promoted and encouraged by Asia to foster financial integration since the Asia financial crisis (Hyun and Jang, 2011 as cited in Mandigma, 2014). Economies were then trying to promote cooperation in bond developments in the region. However, Ehigiamusoe and Lean (2018) argued that while financial integration can stimulate long-term economic growth, developing economies shouldn't wholly depend on national savings but should still encourage foreign capital inflows (Reisen & Soto, 2001 as cited in Ehigiamusoe & Lean, 2018). "Double Mismatches" of maturity and currency should be avoided by the bond market development, which aggravates the financial crisis in East Asia and recycles considerable Asian savings without having to go through advanced world capital markets.

According to Mandigma (2014), ASEAN countries' government bond yields were stable, except for Indonesia and the Philippines, which showed unstable yields with 1.39 and 1.17 standard deviations. Mercado (2020) stated that the Philippines have an overall positive effect on capital inflows, which means that total gross inflows are expansionary for credit and output growth. A one percentage point increase in the ratio of total inflows to GDP increased credit growth by 0.9 percentage points and output growth by 0.3 percentage points. This finding also confirmed that capital inflows in the Philippines have a procyclical nature. It is important to note that while both bond and non-bond inflows were shown to have a positive impact on output growth, only non-bond inflows, however, had statistically significant effects. Both bond and non-bond inflows were also shown to have positive effects on credit growth, but when segregating the impact of credit to the public and private sector, neither bond nor non-bond inflows had a significant impact on the public sector credit. On the other hand, both types of inflows had significant positive effects on the private sector credit. Mercado (2020) argued that such results contradict the "BOGC" model, a model proposed by Blanchard, Ostry, Ghosh, and Chamon (2015), that bond inflows had a contractionary effect, while non-bond inflows had an expansionary effect.

As mentioned before, non-bond inflows had an expansionary effect. This indicated that the significant reduction in domestic returns on non-bonds (causing it to offset the contractionary impact of capital inflows via exchange rate appreciation) resulted in an overall expansionary outcome. Additionally, the significant positive effects from the private sector credit can be justified by the fact that most foreign purchases of the private sector came from real estate, manufacturing, utilities, mining, and the banking sectors. According to Mercado (2020), debt issuance of said sectors can be accompanied by domestic financing, thus increasing bank credit and having an expansionary effect on output. However, findings also suggested that foreign direct investment in the Philippines had positive but insignificant effects. This result also contradicted the BOGC model, indicating a positive and significant

impact of FDI gross inflows on credit and output growth. Considering the Philippines has many restrictions on FDI, thereby receiving less FDI relative to other countries, Mercado (2020) stated that the result was to be expected. Moreover, an increase in the policy rate significantly decreased both credit and output growth. A one percentage point increase (per annum) in the domestic policy rate decreased credit growth by 0.4 percentage points and output growth by 0.5 percentage points. However, an increase in foreign reserves significantly decreased credit growth, especially in the private sector. This finding also contradicted the BOGC model, indicating that non-bond returns must dramatically reduce to intensify the expansionary effect of capital inflows on credit and output growth. The Philippines, along with other emerging countries, experienced the contractionary impact of foreign exchange sterilization during the early to mid-1990s. Overflowing capital inflows were sterilized by increasing the domestic lending rate to stabilize the exchange rate. This then resulted in high domestic bank lending rates relative to other East Asian countries, triggering excessive foreign borrowing by the private sector through domestic banks.

According to Mercado (2020), the opposing results can be attributed to: first, Mercado (2020) study's timeline started from 1977 when the Philippines had a managed exchange rate; while Blanchard et al. (2015) started from 2000 when emerging countries began to adopt more flexible exchange rate regimes. The difference in the chosen timeline may be because the contractionary impact of bond inflows on output growth depended on a flexible exchange rate. Thus, resulting in a weaker channel by which capital inflows lead to an output contraction via domestic currency appreciation under a managed exchange rate. Second, from 1986 to 1994, net portfolio inflows (which are primarily in bonds) of the Philippines had a positive impact on investment (Lamberte, 1995 as cited in Mercado, 2020). Mercado (2020) argued that the impact of bond inflows depends on whether financing flowed to productive investments, which was positive in the Philippines' case. If debt issuance proceeds are directed to productive investments, bond inflows may not necessarily be contractionary. Lastly, despite implementing a managed exchange rate in the past, bond inflows to the Philippines had an average of 0.8% of GDP for 1977 up until 2017, contradicting the principle of a managed exchange rate that acts as an assurance against currency risks for foreign investors (Magud et al., 2014 as cited in Mercado, 2020). In a country with a less developed capital market, as in the Philippines, the contractionary impact of bond inflows may not be seen. This meant that most of the bond issuance was undertaken by financial institutions and was used to support lending. Nonetheless, the pace of bond inflows was too slow to have registered any significant impact on output growth, and the state of the debt markets in the Philippines of not being well developed resulted in a "deterrent effect" (p. 12). Despite the Philippines having restricted FDI inflows, non-bond inflows were still positively affecting credit and output growth. This implied that the Philippines, a country with a less developed capital market, which depends less on FDI and external demand, and engages in foreign exchange intervention, could still gain from the expansionary effect of capital inflows.

#### **2.4.2 Challenges and Policies**

The AEC blueprint displayed the strategic schedule for the ASEAN Economic Community. For the strategic approach for liberalization, by 2015, the blueprint intended to complete the final phase of the progressive elimination of investment restrictions. In the timeline that the ASEAN set, ASEAN countries should be able to realize an open and free regime with limited to no restrictions at all, thereby achieving harmonization of investment measures to encourage investment flow (ASEAN, 2008). For the strategic approach to achieving a freer capital flow, strengthening and developing ASEAN capital market integration was the priority. By 2015, the AEC community aimed to achieve greater harmonization in the ASEAN's capital market standards in distribution rules, disclosure requirements, and rules for debt securities. Additionally, the blueprint also included facilitating a mutual agreement for cross-recognition of education, experience, and qualification of market professionals for a freer capital inflow. Lastly, strengthening the withholding tax structure to promote widening the investor base in ASEAN debt issuance and achieving a more adaptable and flexible securities issuance in terms of governing law requirements and language were also included in the 2015 plan for a freer capital inflow. According to ASEAN (2008), achieving a freer capital inflow is guided by three principles: (i) establishing capital market liberalization that is consistent with member countries' readiness and national agenda; (ii) adopting necessary and adequate safeguards for future macroeconomic instability and risks that comes with the liberalization process; and (iii) guaranteeing liberalization benefits to be allocated by all ASEAN members (ASEAN, 2008). But it should be noted that capital account liberalization would lead to a more liberal capital account regime. Still, we can't expect it to result in a fully open capital account (Rillo, 2018).

According to Asian Bond Monitor (2017), yield movements for September 1 to October 31 for Philippine local currency (LCY) were varied. All maturities between 2 and 20 years increased except for 5-year and 20-year tenors, falling 7.8 bps (basis points) and 0.8 bps, respectively. Tenors whose yields rose with an average of 19.1 bps, with the most significant increase coming from 4-year tenor with 40.8 bps. Maturities of 1-year or less also fell with an average of 2.1 bps. As observed, the increase in yields of most long-tenor bonds and decrease in yields of short-tenor bonds implies that market participants are cautious of the expected hike in the interest rates from the US Fed in December. Additionally, this also suggested that the local market analyzes and uses movements in US Treasury yields as a guide. Furthermore, the BSP maintained the overnight reverse repurchase interest rate at 3%.; inflation remained manageable, and expectations continued to be within the government's target range of 2% - 4%. Domestic economic activities remained resistant. Improvements in the Philippines' absorptive capacity were also found to have mitigated

inflationary pressures from credit expansion. During the fourth quarter of 2017, the Philippine local currency (LCY) bond market grew 5.1% q-o-q (quarter-on-quarter) and 12.5% y-o-y (year-on-year), reaching PHP 5,475 billion or about USD 110 billion. Government bonds outstanding rose 5.8% q-o-q, 12% y-o-y, totaling to PHP 4,456 billion, which are driven by 5-year Retail Treasury bonds amounting to PHP 255 billion. Lastly, outstanding corporate bonds grew 2.2% q-o-q and 14.4% y-o-y. It should be noted that results are based on the year 2017 as this is the relevant timeline and is the most significant year to take note of in this study.

Due to the limited literature on the Philippine bond market specifically limited this study to comparing and testing if past authors' arguments are valid and significant in the Philippines. However, the varied opinions from authors who mentioned the Philippines' bond market concerning emerging economies are still notable. According to Pongsaparan and Unterberdoester (2011), in emerging Asia (excluding Malaysia and Korea), bond market capitalization had less than 50% of GDP, compared to 107% in Europe and 173% in the United States. Debt and equity investments were also more comparable in other regions than in Asia. Mandigma (2014) mentioned the Philippines' government bonds yields being volatile, though this may be due to convergence. According to the findings of Rillo (2018), there was a steep decline in coefficient of variation in the ASEAN 4 (Indonesia, Malaysia, Thailand, and the Philippines), implying that bond yield convergence was most marketed in said countries and that the spreads in said countries have started to move close to each other.

According to Meensah and Premaratne (2018), increasing integration within the region could increase the risk of exposure to external factors. An increase in financial integration can cause high capital mobility, which was established as a source of crises. According to Robiyanto and Ernayani (2018), there were significant risks associated with the finance and liberations of capital traffic. One of several threats would be the contagion effect, which happens if one capital market collapses, impacting the other integrated markets or the other way around (Robiyanto & Ernayani, 2018).

According to Rillo (2018), there are four (4) crucial points to deepen the financial integration in ASEAN. (i) the continued priority of policies that promotes the development of financial markets; (ii) the implementation should be strengthened and strive by the ASEAN at the national level; (iii) regional financial integration monitored and should be pursued with greater urgency; (iv) development goals, greater macroeconomic, and policy coordination is achieved by the needs of policy instrument designed, even though not an end by regional financial integration. On the other hand, it mentioned no significant effect of financial integration on economic growth in other countries (Edison et al., 2002, as cited in Ehigiamusoe and Lean, 2018). Through a sustainable macroeconomic environment, good institutions and higher human capital could help to reduce the negative effects of international financial transparency (Ahmed, 2011 as cited in Ehigiamusoe and Lean, 2018).

Bond market integration could also be a source of vulnerability. According to Sobrun and Turner (2015), the increase in borrowing of international bond markets increased wholesale bank deposits, expanding the balance sheets of emerging markets' banks. The authors further argued that deeper debt market integration changed how changes in monetary policies made in other developed countries and non-monetary forces on global real long-term interest affected debt markets in emerging economies (Sobrun & Turner, 2015). Domestic banking markets would be formed by changes made in global debt markets. Central banks would now have to give more attention to the impact of domestic policy rates on debt markets, on banks, and on exchange rates.

Vinokurov (2017) listed restrictions that are still present for the ASEAN capital markets: (i) currencies were limited to be used by most of the countries; (ii) local currencies have restrictions on the overseas for borrowing and lending; (iii) investors were restricted the most of the countries in the foreign exchange risk hedge; (iv) withholding tax was still used by some countries in their securities investment.

In this regard, Heinrich (2007) explained how central banks could contribute to regional integration. One of these was the creation of a monetary union. Creating a monetary union by creating a new currency area that includes several countries with different currencies, monetary policies, and monetary authorities is a challenge, indeed. Heinrich (2007) mentioned that the creation of the European Central Bank would not be possible without three (3) elements: a clear process, a central hub (where all central banks can participate), and a standard interbank payment system (to give financial institutions access to the same central bank money). Another possible contribution of central banks was the example set by Asian central banks through the Asian bond fund initiative. Developing financial markets and increasing liquidity in domestic bond markets could be an interest to central banks. The Asian Bond Fund 2 (ABF 2) initiative was possible because of the coordinated efforts to create a better financial market. Despite Asia's size, the ABF 2 was effective in promoting reform efforts within domestic bond markets. By bringing together officials from countries involved, they could discuss the mechanics of establishing bond funds, enhance the understanding in their respective domestic markets, and recognize important market impediments. In conclusion, it was effective in giving attention to the importance of segmentation risks and issues standardization (Heinrich, 2007).

While freer capital inflows could provide greater economic opportunities, policymakers should not forget the risks that come with large-scale capital flows that could threaten macroeconomic and financial stability. Since the global financial crisis, a series of external financial shocks have affected the global economy because of unconventional monetary policies made by advanced economies. The significant impact from policies led to extraordinary capital flows movements among EMEs that increased the vulnerabilities of exchange rates and domestic financial conditions. Since 2005, the Philippines has experienced several episodes of capital surges similar to other EMEs. Responses taken were then conditional on the nature of factors that prompted the surges and the circumstances during those times (BSP, 2019).

In response to supporting and developing both regional and domestic bond markets, the BSP created more varieties of financial products that stimulated market activity and enhanced greater liquidity and market depth (BSP, 2019). According to the BSP (BSP, 2019), several actions taken by the BSP helped keep the FX market from being too volatile and provided enough domestic liquidity, allowing the BSP to keep inflationary pressures at bay. To control the increase in liquidity and prevent inflationary pressures, BSP implemented policies such that a special deposit account (SDA) of banks, a monetary policy instrument, would be considered as alternative compliance for liquidity floor requirements for government deposits only and was not intended to be used for investment activities from non-resident sources. The BSP should continue and intensify its network analysis to examine if the country is vulnerable in terms of the interconnectedness of banks and firms; collaborate and cooperate more with other central banks to have more information.

Rana et al. (2012) stated that policy ramifications should include (i) the implementation of regional monetary unit (RMU) would make an important contribution to ASEAN+3 economic integration by improving the ERPD and resulting in increased exchange rate coordination, (ii) the ASEAN+3 should entrust the ASEAN+3 Macroeconomic Research Office (AMRO) with measuring the regional monetary unit (RMU) by Chiang Mai Initiative Multilateralization (CMIM) weights and making it public daily. The ASEAN+3 could designate ASEAN+3 Macroeconomic Research Office (AMRO) budget, contributions, and operations, Chiang Mai Initiative Multilateralization (CMIM) to the regional monetary unit (RMU) to ensure a sustainable exchange rate.

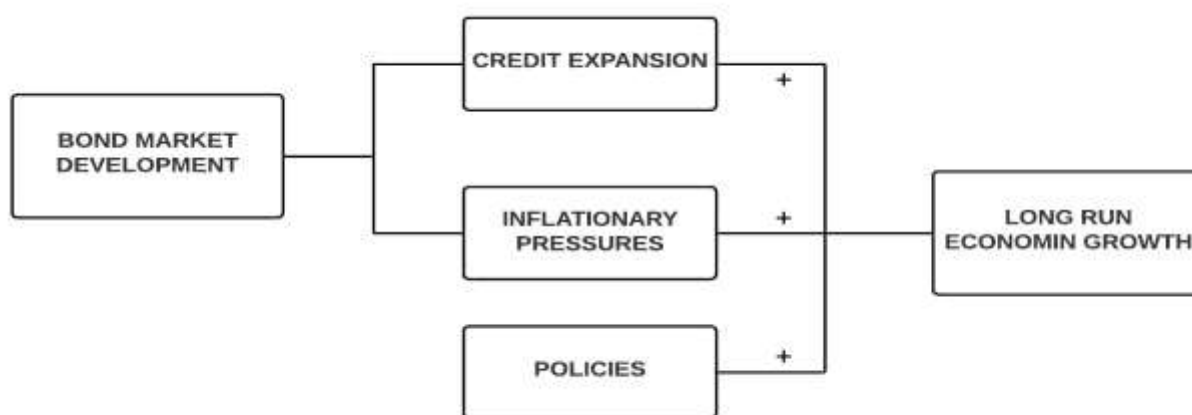
Clearly, ASEAN bond market integration has a long way to go, albeit with the structural changes and progress made in the Asian financial systems during the past years. Intra-regional financial flows were still relatively small even if debt markets were growing rapidly (Mandigma, 2014). The Philippines' role in the ASEAN association could be used to its advantage. According to Baharumshah et al. (2007), almost 97% of the global trade comprises economies that were members of a trading arrangement with others at best. Joining regional integration with other economies through regional trading arrangements (RTAs) broadens the scope of the integration with the increasing number of members, thus reducing risks to external shocks, increasing productivity, investment, and employment, thus achieving economies of scale, improving living standards, and progressing bargaining status internationally.

According to Shimizu (2014), financial systems in the ASEAN region had varying levels of development because of differences in regulations, infrastructures, market sizes, and, most importantly, what each economy needed. For what other countries regard as important or essential to them (such as regional integration), others may regard otherwise. Accordingly, Shimizu (2014) argued that this exemplified the need to open the integration, thus increasing competitiveness. Individual countries face the consequences and, therefore, would need to strengthen and enhance their financial systems to compete with others, while policymakers would need to reduce development gaps between economies. While competition could ultimately achieve efficiencies, it might not necessarily promote financial stability. However, Ventouri (2018) argued that with the "competition-fragility view", competition could create a level playing field (which can lead to efficiencies) whilst also promoting financial stability by limiting bank's market power to charge high rates on household loans which could eventually lead to high non-performing loan if not lessen. Nevertheless, Baharumshah et al. (2007) stated that open regionalism could integrate domestic policies with globalization's forces and could also encourage "outward-oriented" progress, both of which supported the argument of Leamer (1994) that regionalism could eliminate political constraints and ramifications (which was the biggest challenges of global free trade), which signified that regionalism was the only way to carry out global free trade (Leamer, 1994 as cited in Baharumshah et al., 2007).

ASEAN was only meant to be a vehicle for competition and liberalization as the region's participation in the world market was the ticket to an effective development process (Baharumshah et al., 2007). While it is worth mentioning that the Philippines was successful in sustaining its growth momentum pre-GFC (global financial crisis) due to the strong macroeconomic fundamentals, which was proven by having a strong external position, benign inflation, and a resilient banking system (BSP, 2019), it is still important to emphasize that the Philippines is still a developing country. According to Atje and Titiheruw (2016), developing countries' bond markets tend to be more unstable and volatile, which could be shown in the adverse imbalance from the developed countries' bond market (Burger & Warnock, 2007 as cited in the & Titiheruw, 2016). Mercado (2020) enumerated three natures of the Philippines. Firstly, the Philippines' output growth was mostly influenced by consumption growth. Unlike its neighboring countries like Indonesia and Malaysia, the Philippines barely depended on foreign trade as a source of growth. Because of this,

there was a weaker contractionary effect on overall output growth from currency appreciation; unexpected changes in foreign and domestic stock returns also have a big impact on output growth (Hassapis & Kalyvitis, 1997 as cited in Lim, 2009). Secondly, the Philippines was less open than other countries, bringing less foreign direct investment to the economy. Lastly, during the 1970s until mid-1997, the Bangko Sentral ng Pilipinas (BSP) was involved in the foreign exchange market to maintain a stable exchange rate. All of the aforementioned characteristics proved that the Philippines is a small, weak open economy that is still exposed to external factors and is challenged by the monetary policy trilemma while still depending less on foreign trade and foreign direct investments. Atje and Titiheruw (2016) identified factors that impede the growth of bond markets in Asia. One of which was an economy's size. According to the authors, larger economies are likely to have more capitalization compared to small economies. Other factors mentioned are poor government quality, failure to comply with international accounting standards, capital control, and corruption (Eichengreen & Luengnaruemichai, 2004 as cited in Atje & Titiheruw, 2016). All of which are evident in the Philippines. Further regional cooperation could serve as a buffer in times of crisis and strong macroeconomic fundamentals. Bond market development is undoubtedly needed in the Philippines as it not only stimulates growth but also strengthens the financial system by avoiding mismatches, lessening its vulnerabilities. Furthermore, the bond market plays a significant role in capital and bank markets since financial intermediation endeavors can still be accomplished with a multilayer financial intermediation even if primary intermediaries are troubled (Atje & Titiheruw, 2016).

### Simulacrum



In this regard, given the contradicting opinions and empirical shortfalls, this study seeks to refute the following statements:

- I. *There is no significant relationship between ASEAN bond market integration and credit expansions in the Philippines.*
- II. *There is no significant relationship between ASEAN bond market integration and inflationary pressures in the Philippines.*
- III. *The bond market integration has no significant effect in the Philippines.*

### 3. Research Method

This section tests whether ASEAN bond market integration in the Philippines had an impact on inflationary expansions, credit expansions and identifies the obstacles that impede the growth of the bond market in the Philippines. This study is quantitative in nature with the use of traditional economic tools such as structural stability test, test for heteroskedastic disturbances, Johansen cointegration test, Granger causality test, time series plot, and Augmented Dickey-Fuller tests using time series data. Pradhan et al. (2018) used panel data for testing if G-20 countries during the period of 1991 up to 2016 if stock & bond market development and growth have Granger causal relationships with real interest and inflation rate. Using the Granger causality test, Mandigma (2014) mentioned that it is limited due to the fact that it only determines whether there is a current relationship between bond yields and can't measure the bond's dynamics and influence. Mensah and Premaratne (2018) also argued that standard correlation has its limitations since it only presumes stationary relationships and ignores the unpredictability of other variables.

Unlike the wide literature about the ASEAN bond market integration, this study is specifically about the Philippines, focusing on the national level. This study covers the period from 1992 up to 2017. This choice is justified by the need to test whether prior crises (both Asian and global financial crises) had an impact on the Philippines' bond market and if the results are consistent with the other related studies.

To measure the degree of integration,  $\sigma$ -convergence is used, derived from Vodova (2009). For quantification of  $\sigma$ -convergence, a cross-sectional standard deviation of interest rates is used and can be calculated by equation (1):

$$\sigma_t = \sqrt{\left(\frac{1}{N-1}\right) \sum_{i=1}^N \left[ \log(y_{it}) - \log(\bar{y}_t) \right]^2} \quad (1)$$

$y_{it}$  is the yield in country  $i$  at time  $t$ ;  $\bar{y}$  is the cross-section mean yield at the time  $t$ ;  $i$  represents all ASEAN countries ( $i = 1, 2, 3, \dots, N$ ). In this regard, the cross-sectional standard deviation can only be positive. The lower the cross-sectional standard deviation value, the higher the degree of convergence. Full integration is achieved when the standard deviation results in zero and cross-sectional distribution fall to a single point. This will then be the variable, INT, which stands for level of integration.

In addition, credit and inflation are measured by using data gathered. Furthermore, this study also used Gross Domestic Product per capita growth (GDP), bond market development index (BMD) (measured by bond market development index), Inflation (INF), Credit to the economy (CE), and lastly, interest rate (RIR) (measured by real interest rate) as variables. Derived from the papers of Pradhan et al. (2018), the variable bond market development index is a composite index from three bond market indicators, namely private sector bonds (PRB), public sector bonds (PUB), and international bonds (INB). The secondary data used in this study are obtained from the publication of World Bank data and the Asian Development Bank data.

Variables in this study, such as the macroeconomic variables, e.g., inflation rate, real interest rate, economic growth, and bond market development index, are adopted from Pradhan et al. (2018); however, instead of panel VAR, this study uses a time-series regression model. The inflation rate is used to measure the change in the real GDP deflator. The real interest rate is used to measure the borrowing rate adjusted for inflation. Per capita economic growth is used to measure economic growth. In addition, the bond market development index is the composite index of three bond market indicators, namely: PSB, PUB, and INB. *PSB* is measured by the ratio of the private sector bonds to the GDP. *PUB* is measured by the ratio of the public sector bonds to the GDP. *INB* is measured by the ratio of international bonds to the GDP. Lastly, the credit variable is derived from Arséne and Guy-Paulin (2013), where their study used credit to the economy measured by the ratio of credit in the percentage of GDP, excluding credit to the government, to measure the effectiveness of credit to private sectors and households vis-à-vis economic growth.

The BMD index was created by using the principal component analysis, which entails several steps such as constructing a data matrix, generating the standardized values, computing for the correlation matrix, determining the eigenvalues and eigenvectors, selecting principal components (based upon stopping rules), and interpreting the results (Hosseini and Kaneko, 2011 as cited in Pradhan et al., 2018); to formulate a new set of variables: "principal components" ( $P_i$ ), that are linear combinations of the  $X$ 's. This was presented as:

$$P_1 = a_{11}X_1 + \dots + a_{1n} X_n$$

$$\vdots$$

$$P_m = a_{m1}X_1 + \dots + a_{mn} X_n$$

$P = [P_1, P_2, \dots, P_m]$  are the principal components;  $A = [a_{ij}]$  for  $i = (1, 2, \dots, m)$ ; and  $j = (1, 2, \dots, n)$  are component loadings; and  $X = [X_1, X_2, \dots, X_n]$  are original variables. Component loadings are the weights that show the variance contribution of principal components to variables.  $a_{ij}$  weights proportionally to correlation coefficients between the variables and the principle components since principal components were selected orthogonal to each other.

$P_1$ , or the first principal component, was determined as the linear combination of  $X_1, X_2, \dots, X_n$ , given variance contribution is at a maximum.  $P_2$ , or the second principal component, was determined to present the maximum contribution to the total variance left after the variance explained by the first principal component. Similarly,  $P_3$ , and other succeeding principal components, were determined to provide the maximum contribution to the remaining variances and independent of each other. This was done to determine  $a_{ij}$  coefficients that provide the linear combination of variables based on the specified conditions.

Pradhan et al. (2018) also mentioned that the method of principal components could be applied using  $X$ 's original value by their standardized variables or by their deviations from their means. Like Pradhan et al. (2018), this study also used standardized variables since it is assumed to be more extensive and can be applied to variables that are measured in different units. The loadings, or the coefficients  $a$ 's, are chosen based on the categories that constructed principal components are: (i) orthogonal or uncorrelated; and (ii) in the set of all  $X$ 's,  $P_1$  or the first principle component absorbs the maximum possible proportion of total variation.

Additionally, the study also mentioned having varieties for stopping rules or rules that define a high magnitude. Out of the choices, the “variance-explained” criteria was implemented to keep sufficient principal components to account for 90% of the variation (Pradhan et al., 2014a, 2014b, 2014c as cited in Pradhan et al., 2018).

The equation below was derived from Pradhan et al. (2018) and was used to construct the *BMD*, the composite index for bond market development:

$$BMD = \sum_{i=1}^3 a_{ij} \frac{X_{ij}}{Sd(X_i)} \quad (2)$$

*BMD* is the composite index of bond market development. *Sd* is the standard deviation.  $X_{ij}$  is the *i*th variable in the *j*th year.  $a_{ij}$  is the factor load derived from the PCA.

This study used the model proposed in the study of Pradhan et al. (2020) as a general model.

$$GDP_{it} = \mu_{it} + \theta_{1i}BMD_{it} + \theta_{2i}SMD_{it} + \theta_{3i}INF_{it} + \theta_{4i}RIR_{it} + \epsilon_{it} \quad (3)$$

*GDP* is the per capita economic growth. *BMD* is the bond market development index. *SMD* is the stock market development index. *INF* is the inflation rate. *RIR* is the real interest rate. *i* is the country in the panel. *t* is the year in the panel.  $\theta_j (1,2,3,4)$  are the parameters for estimation of long-run elasticity with *GDP* to *BMD*, *SMD*, *INF*, and *RIR*.

With modification to our study, the researchers removed stock market development and sub-variable *i*, which represents each country in the panel since this study only focused on the Philippines alone and added credit to the economy. Equation 4 describes the long-run relationship between the variables that are relevant to this study.

$$GDP_t = \mu_t + \theta_1BMD_t + \theta_2CE_t + \theta_3INF_t + \theta_4RIR_t + \theta_5INT_t + \epsilon_t \quad (4)$$

*GDP* is the per capita economic growth. *BMD* is the bond market development index. *CE* is the credit to the economy. *INF* is the inflation rate. *RIR* is the real interest rate. *INT* is the degree of integration. *t* is the year in the time series.  $\theta_j (1,2,3,4)$  are the parameters for estimation of long-run elasticity with *GDP* to *BMD*, *CE*, *INF*, and *RIR*.

### 3.1 Augmented Dickey-Fuller (ADF)

Most economic time series data have unit roots which show that their means and variances are not time-invariant. If this is the case, a univariate series is said to be non-stationary and cannot be used for regression with other non-stationary univariate series because of the risk that their results may be spurious. The only exception to this rule is when the time series data of all variables have identical unit-roots.

The widely used unit root test is the so-called Augmented Dickey-Fuller (ADF) test. The basic equation for testing the stationarity of a time series is given by the following:

$$\Delta x = \alpha_0 + \alpha_1 t + \beta x_{t-i} + \sum \varphi \Delta x_{t-i} + \epsilon_t$$

Where the first difference of the series,  $\Delta x_t$ , is regressed against lagged of its original level series, time, and lagged values of itself. If the estimated value of  $\beta$  is more negative than MacKinnon critical values, the series is said to be stationary. Otherwise, it is non-stationary and therefore has a unit root. The augmented portion of the test is to correct for any serial correlation in the variable.

### 3.2 Structural Stability test

The structural stability test refers to the stability of the coefficients of a regression model between different time periods. In this study, such a test will be performed using the Chow Breakpoint Test. A structural change could mean a change in the intercept, a change in the slope coefficients, or a change in both the intercept and slope coefficients. Either way, the results would imply structural instability, and the model, therefore, cannot be used for policy analysis and forecasting.

The formula for testing the structural stability of the regression parameter involving time series data is as follows:

$$F = \frac{(RSS_R - RSS_{UR}) / k}{RSS_{UR} / (n_1 + n_2 - 2k)}$$

Where  $k$  is the number of regressors including intercept,  $n$  is the number of observations,  $RSS_R$  is the regression sum of squares restricted, and  $RSS_{UR}$  is the regression sum of squares unrestricted. If the computed F-statistic exceeds the critical value, there is structural instability. Otherwise, the model is said to be structurally stable.

**3.3 Test for Heteroskedastic Disturbances**

If the variance of the regression residuals of the model is time-varying, the parameters and their standard errors are said to be biased and inefficient. This condition is known as heteroskedasticity and, if uncorrected, could lead to wrong conclusions and decisions on the part of the investigator. To detect the presence of heteroskedastic disturbances in the residuals, the White Heteroskedasticity Test will be used.

$$u^2 = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_1^2 + \alpha_5 X_2^2 + X_3^2 + \alpha_6 X_1 X_2 + \alpha_7 X_1 X_3 + \alpha_8 X_2 X_3 + v_t$$

Where  $u^2$  is the squared regression residuals regressed against the explanatory variables, their squares, and cross products.

**3.4 Optimal Lag Length**

An efficient test in determining the optimal lag length is to minimize the Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), or Bayesian Information Criterion (BIC) for each lag length on a trial-and-error basis. For the Akaike Information Criterion (AIC), which is a popular test, the formula is as follows:

$$\ln AIC = (2k/n) + \ln (RSS/n)$$

Where  $k$  is the number of regressors including intercept,  $n$  is the number of observations, and  $RSS$  is the regression sum of squares. After experimenting with a sufficient number of lags in the model, the one which produces the smallest AIC would indicate the appropriate or optimal lag length.

**3.5 Johansen Cointegration Test**

In applying the Johansen Cointegration Test, which consists of five options, although options 1 and 5 are avoided because of their explosive values, which are not consistent with economic realities, such options were utilized according to the Dickey-Pantula principle by beginning with the most restrictive (Option 2) down to the least restrictive (Option 4).

If the computed *trace statistics* and *maximum-eigenvalue statistics* exceed their critical values, then there is cointegration among the variables. The hypothesized relationships cannot be deemed spurious, and therefore, genuine equilibrium relationships existed.

**3.6 Ramsey Regression Equation Specification Error Test (RESET)**

The Ramsey Regression Equation Specification Error Test (RESET) will be used to test whether non-linear combinations of independent variables help in explaining the dependent variable. This will also help determine if there is no misspecification error in the data used in the study.

A Specification error test is associated with the specification of the model regarding the inclusion of an irrelevant variable, the exclusion of relevant variables, or the functional form of the model. A Specification error creates biased or inconsistent regression estimators, and the inconsistency can still be there even when the sample observation increases. To determine the specification of the model, this study used the equation:

$$\hat{Y}_i = \hat{\beta}_1 + \hat{\beta}_2 X_{2i} + \hat{\beta}_3 X_{3i} + \gamma \hat{Y}_i^2$$

**3.7 Test for Serial Correlation**

The Breusch-Godfrey test will be used to test whether autocorrelation exists in the errors of the regression model used in the study. Unlike the Durbin-Watson statistic, the Breusch-Godfrey is more general and powerful since it has no restrictions as the Durbin-Watson has. The null hypothesis dictates that there is no serial correlation of any order. If the f-statistic is greater than the significance level, the hypothesized model has no serial correlation. This study used this equation to test for autocorrelation:

$$\hat{u}_t = \alpha_0 + \alpha_1 X_{t,1} + \alpha_2 X_{t,2} + p_1 \hat{u}_{t-1} + p_2 \hat{u}_{t-2} + \dots + p_p \hat{u}_{t-p} + \epsilon_t$$

**4. Results and Discussions**

This study used the following econometric and descriptive tools: mean, standard deviation, Augmented Dickey-Fuller (ADF) test, Structural Stability test, Test for Heteroskedastic Disturbances, Optimal Lag Length, Johansen Cointegration Test, Ramsey Regression Equation Specification Error Test (RESET), and VAR model.



Table 1: Summary Statistics, using the observations 1960 - 2017

Variable	Mean	Std. Dev.
GDP	1.846612	3.012514
CE	0.408747	0.139799
INF	8.880561	8.309557
RIR	4.441894	4.659957
BMD	-2.69E-08	1.000001
INT	0.482912	0.302694

Table 1 shows the summary statistics for the variables GDP, CE, INF, RIR, BMT, and INT. Amongst the variables, GDP, INF, and RIR are the most volatile.

#### 4.1 Augmented Dickey-Fuller Test

The empirical investigation begins with using the unit root test to attain stationarity for time series variables (Pradhan et al., 2018). Using the ADF test, the null hypothesis of having one unit root (non-stationarity) was employed on EViews to ensure that the variables are free of serial correlation and errors. For all the variables, the assumption of one unit root or random walk is at a 5% significance level.

Table 2: Augmented Dickey-Fuller Test

Variable	Level with constant	Level with constant and trend	First Difference with constant	First Difference with constant and trend	Second Difference with constant	Second Difference with constant and trend
BMD	0.0104	0.1550	0.0001	0.0003	0.0001	0.0001
INT	0.3593	0.8801	0.0000	0.0000	0.0000	0.0000
GDP	0.0047	0.0151	0.0000	0.0000	0.0000	0.0000
INF	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000
RIR	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
CE	0.3961	0.2506	0.0000	0.0000	0.0000	0.0000

#### 4.2 Structural Stability test

Using the Chow breakpoint test, the structural difference was employed with respect to 2005. Having an f-statistic greater than alpha, results show that observations do not have a breakpoint and are structurally stable.

Table 3: Chow Breakpoint Test: 2005

F-Statistic	Log-Likelihood Ratio	Wald Statistic	Prob. F(6,14)	Prob. Chi-Square(6)	Prob. Chi-Square(6)
0.474605	4.813973	2.847632	0.9329	0.5679	0.8277

#### 4.3 Test for Heteroskedastic Disturbances

To test for heteroskedasticity, the study used the Breusch-Pagan-Godfrey test. Having an f-statistic greater than alpha, results show that there is no noise or heteroskedasticity.

Table 4: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-Statistic	Obs*R-Squared	Scaled Explained SS	Prob. F (5,20)	Prob. Chi-Squared (5)	Prob. Chi-Squared (5)
0.548093	3.133271	1.786347	0.7379	0.6794	0.8778

**4.4 Ramsey Regression Equation Specification Error Test (RESET)**

This study also used the Ramsey RESET test to check if the models from the multiple regressions are correct. With f-statistic greater than alpha, results show that there are no specification errors.

Table 5: Ramsey RESET Test

	Value	df	Probability
<b>t-Statistic</b>	1.357325	19	0.1906
<b>F-Statistic</b>	1.842332	(1,19)	0.1906
<b>Likelihood Ratio</b>	2.406225	1	0.1209

**4.5 Test for Serial Autocorrelation**

To check if the model from the multiple regression is free of serial correlation, this study used the Breusch-Godfrey test. With an f-statistic of 0.26 greater than alpha, results show that there's no autocorrelation in the errors.

Table 6: Breusch-Godfrey Serial Correlation LM Test

F-Statistic	Obs*R-Squared	Prob. F(2,18)	Prob. Chi-Square (2)
0.269411	0.755678	0.7669	0.6853

**4.6 Optimal Lag Length**

The variables from the data set were used to test on Lag 2 of optimal lag length, which would reduce residual correlation. Based on the results below, the optimal lag length for the variables was 2 given the Akaike Information Criterion (AIC) value at 7.687091, which had the lowest criterion among all.

Table 7: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-148.6882	NA	0.015982	12.89068	13.18519	12.96882
1	-63.38385	120.8478*	0.000291	8.781987	10.84358*	9.328929
2	-14.24510	45.01386	0.000191*	7.687091*	11.51577	8.702840*

**4.7 Johansen Cointegration Test**

All the variables from the data series were tested through the Johansen trace test for the existence of long-run cointegration relationships. Results show that both trace and max-eigenvalue tests indicate co-integration at the 0.05 significance level, as shown in Table 8.

Table 8: Unrestricted Cointegration Rank Test

Hypothesized No. of CE (s)	Trace Statistic	Max-Eigenvalue Statistic
None*	132.8932*	69.42784*
At most 1	63.46532	28.25811
At most 2	35.20721	22.65146
At most 3	12.55575	7.376437
At most 4	5.179312	4.451522
At most 5	0.727789	0.727789

\* indicates rejection of the hypothesis at a 5 percent level of significance

## 4.8 OLS Output Models

Table 9: Dependent Variable: GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	3.593615	1.949483	1.843368	0.0801
BMD	-0.334618	0.291666	-1.147261	0.2648
CE	6.168717	2.895484	2.130462	0.0457
INF	-0.414972	0.091317	-4.544312	0.0002
RIR	-0.227115	0.129783	-1.749957	0.0955
INT	-1.416628	2.012488	-0.703918	0.4896
R-squared	0.692394	Mean dependent var		2.684361
Adjusted R-squared	0.615492	S.D. dependent var		2.280233
S.E. of regression	1.413943	Akaike info criterion		3.729815
Sum squared resid	39.98467	Schwarz criterion		4.020145
Log-likelihood	-42.48760	Hannan-Quinn criteria.		3.813420
F-statistic	9.003635	Durbin-Watson stat		2.267237
Prob(F-statistic)	0.000132			

Figure 1 presents the OLS regression output based on Equation 4 from 1992 to 2017. The multiple regression is statistically significant with a prob(F-statistic) of 0.000132, which is less than the 5% significance level. All independent variables except BMD, INT, and RIR are significant. This result may be due to the limited sampling size of this study.

Similar to other countries' trends, findings revealed that credit expansion positively affects economic growth. For every unit increase in GDP growth, credit to the economy will increase by 6.168717. Contrarily, an increase in GDP growth will decrease the bond market index by 0.334618, inflation by 0.414972, real interest rate by 0.227115, and integration by 1.416628.

Even if the Philippines was greatly affected by the Asian Financial Crisis (AFC), it, however, was able to control credit and inflation during the Global Financial Crisis (GFC). This then extends to GFC having a milder impact on economic growth as compared to AFC. Contrary to Boudias (2015), emerging countries like the Philippines grow more robust and stable with financial integration and liberalization that are being greatly encouraged in ASEAN economies. The findings revealed that credit expansion was effective in promoting growth in the Philippines. The misallocation phenomenon mentioned by Dong and Xu (2019) and Angeles (2015) does not exist in the Philippines. Financial institutions were able to identify to whom to give credit, to which private sector firms are efficient and are included in the high-productivity sector (heterogenous productivity). In agreement with Nasir et al. (2019), this can lead to long-term positive growth if ASEAN economies, like the Philippines, continue this trend; since total gross inflows are expansionary to output and credit growth in the country (Mandigma, 2020).

Following Gillman et al. (2008), inflation and growth do have negative relationships in the Philippines. As GDP growth increases, inflation decreases. This is to be expected as it is the main principle of inflation. As mentioned in Chapter 2.3 by Ajuzie et al. (2008), the monetary phenomenon, inflation, can be caused by an influx in the money supply (or credit to the economy). The increase in credit, therefore, promotes growth in the Philippines. This, again, proves that the Philippines was prosperous in policy implementations. Additionally, this also proves that inflation can be controlled and kept low and stable with the help of the bond market's existence in the country. Inflation was only controlled during the GFC (after the BSP implemented inflation targeting in 2002) but was unstable during the AFC. This proves that inflation targeting by the BSP successfully controlled inflation and reduced the Philippines' responsiveness to inflation shocks.

In contrast to Mandigma (2014), the Philippines have high degrees of integration, suggesting markets are operating dependent on each other. However, even if the bond market is becoming more integrated throughout the years, it was not effective in stimulating growth. In fact, the opposite. Both the variables BMD and INT were found to be insignificant. Yu et al. (2007) mentioned that in Asian countries, there is minimal development, especially for bond market integration, and Rillo (2018) blamed the strict policies and regulations for the Asian financial integration's slow growth. In the Philippines' case, there's a decrease in growth

when BMD and INT increases, but we must remember that there's still a development contrary to what Yu et al. (2007) said. This may be due to the bonds market's age in the Philippines. It should be noted again that the bond markets are comparably young and new in Asia compared to other economies. Even so, like what Atje and Titiheruw (2016) said, the Philippines' government's effort to promote regional integration and strengthen financial sectors was not in vain as the country was more robust and more stable after the AFC. Indeed, integration was more robust after the GFC, as Robiyanto and Ernayani (2008) mentioned. Since the AFC, Asia has promoted and supported financial cooperation, emphasizing developing the region's bond market to generate economic integration (Hyun and Jang, 2011 as cited in Mandigma, 2014). As mentioned by Atje & Titiheruw (2016), the mild impacts of the GFC against the ASEAN bond market compared to the effect of the AFC is due to: first, the limited exposure of financial institutions to subprime mortgage-related securities; second, the improvement of ASEAN's financial institutions.

## **5. Conclusions and Policy Implications**

### **5.1 Conclusions**

The present study examined the effect of the ASEAN bond market integration and past crises on credit expansions, inflationary expansions, and growth. The overall model showed statistically significant results, with the prob(f-statistic) of the regression being less than a 5% significance level. The study also ascertained that credit and inflation were statistically significant. As a result, the study can reject null hypotheses 1 and 2 and thereby conclude a significant relationship between credit with ASEAN bond market integration and inflation with the integration. However, the bond market index and integration were found statistically insignificant. This result may be due to the limited sampling size that was applied in this study. However, it is essential to note that this study used 25 observations for every six variables, which will result in a sum of 150 observations in this study, thereby making this study still valid. Furthermore, this paper also discovered that past crises greatly affected the Philippines; AFC had a more significant impact than GFC.

Credit had a positive relationship with economic growth. While inflation, real interest rate, bond market index, and integration are negatively correlated with growth. Nevertheless, the significance and insignificance of all the variables support the theory of this study. With the Philippines' bond market still being young, this study emphasizes the importance and potential of the ASEAN bond market on the Philippines' economic growth. The difference in infrastructure, regulations, market size and economic needs of each country greatly influences each economy's integration performance. The Philippines should first prioritize developing the bond market and be on par with other ASEAN economies' debt markets. In such a way, the country can exploit and make use of its position in the ASEAN financial integration.

In sum, this paper provides empirical evidence that the ASEAN financial integration successfully strengthened the harmonization in the Philippines. After the Asian Financial Crises, the Philippines was less affected; the Global Financial Crisis had less impact. However, there's still room for improvement. More work lies ahead in further strengthening the financial infrastructure of the Philippines and the development of the bond market. It is expected that it will take many years to establish an efficient and harmonized regulatory framework that will perform such as the Euro bond market (Hyun and Jang, 2008 as cited in Mandigma, 2014).

### **5.2 Policy Implications**

We must remember that regional financial integration is not the end goal but just a policy instrument intended to complete developmental goals. The ASEAN financial integration literature bears many studies about policy recommendations. Rillo (2018) summarized the necessary steps to develop Asian bond markets further. First, prioritizing the policies advocates the development of financial markets by enhancing settlement and payment, forming region-wide portfolio investments and institutional investors, coordinating accounting regulations, and reinforcing trading orders and platforms. Second, intensifying the execution of projects through assuring that the region's integration accomplishments are in line with its constraints and consequences so that policymakers can bring to completion their plans. Third, having more organized observation on reports to analyze and determine which hinders the financial integration in ASEAN. Lastly, the harmonization for macroeconomic objectives and policies, primarily focusing on the financial and trade policies and securing the coordination of both policies. One needs the other, like financial integration needs backing from specialization and using economies of scale from trade integration. At the same time, trade integration needs financial instruments from the financial integration to hedge trade and investment risks. Needless to say, further trade and investments will not be probable without integrating the financial systems. Under trade integration, the Philippines can exploit regional labor market integration. According to Tan (2016), migrant remittances can play a role in macroeconomics and assist in the region's growth. Trade and capital flows can bring not only investments but also technology transfers that can increase productivity growth and income gains. Furthermore, trade and capital mobility can reinforce one another by promoting trade integration through capital mobility (cross-border borrowing and lending).

Market access, market liquidity, transparency, risk assessment, and management are challenges that remain in the Philippines. Nevertheless, all great things take time. The country can start taking baby steps such as (i) the elimination of foreign direct

investment restrictions, (ii) encouragement of private-public relationships, and (iii) strengthening withholding tax structure, and encouragement of research and development. The major impediments to the bond market development are the lack of investor diversity, regulatory framework, market size, lack of deep market, and weak corporate governance. The Philippines would have to foster and cultivate a credit culture. Keeping in mind that credits should be given to the productive sector to prevent misallocation. Hanna et al. (2019) mentioned the first line of defense would be a country's regulatory framework; the Basel Committee on Banking Supervision also provided recommendations regarding capital stability. Further bond market development would not only promote growth but would also serve as a buffer during future crises. It is important to note that the long-run economic growth path will have various transition points on the ASEAN economies. The magnitude of the integration's effect on growth would still vary with a country's size and the level of integration (Ehigiamusoe and Lean, 2018). Although credit inflows were promoting growth, they should still be managed as a precaution from lessons drawn from the past crises. The existence of the bond market would also assist in controlling inflation. According to Rose (2014), countries with inflation-targeting regimes display nominal bonds in local currency decrease inflation by four to five percentage points.

Despite the mentioned policies, it is still worth noting that the Philippines is still exposed to other external shocks. The Asian Development Bank (2017) recommended guidelines to lessen the adverse spillover effects from advanced economies' policies: (i) strengthening macroeconomic fundamentals by decreasing short-term foreign debt, inflation, current account, and fiscal deficits. Having more robust fundamentals enables policymakers to minimize capital flows' effect on the economy, essential for investor confidence and long-term growth. (ii) further deepening capital markets and banking sectors to prevent domestic financial institutions from taking excessive risks in the region and improve banking supervision and prudential rules. Policymakers should adopt long-term policies to diversify and broaden the domestic investor base, offering stronger protection, especially in times of uncertainty of capital outflows. (iii) further developing regional bond market integration and corporate debt market to raise long-term LCY- denominated debt at a cheaper cost while also matching the currency for the corporate sector's financing needs. Integrated LCY bond markets can assist in sustaining growth and provide incentives to the public and private sectors to invest in the domestic market. Thus, reducing the region's dependency on FCY-bonds and vulnerability to external shocks and supporting intraregional trade and investment. (iv) extending credit improvements for LCY bonds to encourage more cross-border corporate bond issuance and solve the region's long-term funding requirements that focus on enhancing infrastructures. (v) delve into expanding AMBIF bond issuances to businesses in different areas of developing Asia after cross-border bond issuance has become established in Asia.

The BSP's role would be crucial on macroeconomic and financial stability in the bond market integration. It would have to be more attentive to the impacts of the policy rates on banks, exchange rates, and the debt market. Eventually, the central bank's task would be more significant when the Philippines' bond market is of the same level as other ASEAN economies. Harmonization with other economies, coordination of regulatory reforms, and creation of a monetary union are plausible tasks left to central banks. But then again, this is for future discussions. Policymakers should focus on deepening further financial integration in the region and globally. It is a vital factor in financial development to make economies resilient and strengthen domestic sources of growth, providing support for economic rebalancing.

The present study has some limitations. First, the BMD (bond market index) was created using treasury bills data. The result of the study may vary when actual bond data was used. Second, the results may also change if the sample period was longer and more data was available and recorded before 1992.

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