FINANCIAL INCLUSION AND FINANCIAL STABILITY IN THE PHILIPPINES

A RESEARCH PAPER

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Research Outline

Executive Summary

Financial inclusion is “a state wherein there is effective access to a wide range of financial products and services by all”. The basic products and services include savings, credit, payments, insurance, remittances and investments, among others, for different market segments including the unserved and underserved.

The G20 leaders endorsed financial inclusion as a key pillar of the global development agenda in 2010 while the United Nations’ (UN) launched of the Sustainable Development Goals (SDGs) in 2015 highlights the role of financial inclusion in achieving the SDGs. Financial inclusion has transitioned from a mere strategy for poverty alleviation into being a central policy development area for achieving sustainable growth. Universal access to finance stimulates entrepreneurial activities enabling poor households and small businesses to improve their livelihood and sources of income.

Countries adopt different approaches in pursuit of universal access to finance depending on their country-specific situations and constraints. Improvements in access to finance have been reported as a result of these initiatives. However, wide disparities still exist in the level of financial inclusiveness among countries.

As leaders and policymakers pursue different programs to promote financial inclusion and achieve universal access to finance particularly for the traditionally unserved or marginalized sectors of the society, the activities changes the operations in the financial system such as the type of customers, the nature of transactions, the diversity of financial service providers and their business models and the regulations and supervisions of regulatory bodies. Changes in the interoperability between households, firms and government may impact the smooth operation of the financial system, which can either strengthen the financial system or contribute to financial instability.

The study centers on two agenda, (1) to describe the extent of financial inclusion in the Philippines; and (2) to analyze the relationship between financial inclusion and financial stability such as the increase in financial inclusion contributes to financial stability of the Philippine banking system. The paper is organized as follows: Section I provides an introduction. Section II explains financial inclusion and financial stability and provides a literature review. Section III provides a theoretical framework used in our analysis. Section IV describes the Philippine financial system

and current status of financial inclusion. Section V presents the data sources and methodology. Section VI discusses the findings. Section VII summarizes and some policy implications.

In the Philippines, where the financial system is bank-dominated, financial inclusion is an institutionalized agenda. It is a platform to providing better lives to Filipinos. The country has achieved milestones in the development of financial inclusion since it initially put up strategies to improving access to finance in 1997. National strategies and policies were further enhanced with focus on areas of policy, regulation and supervision; financial education and consumer protection; advocacy programs; and data and measurement. However, there are still opportunities for improvements to ensure that demands for access to finance are met. Overall, the level of financial inclusion is still far from other developing countries or ASEAN neighbor countries. The regulatory framework must continue to be responsive to both suppliers and users of financial services and be an enabler of development of financial inclusion.

The current financial inclusion in the Philippines has yet to impact the financial stability in the country. Increase financial inclusion at its current level neither improves financial stability nor results to financial instability. There is no sufficient evidence to make definitive conclusion on the relationship between financial inclusion and financial stability. The study showed no contemporaneous relationship of NPL with number of physical institutions, lending to MSMEs, liquidity and GDP. It can be attributed to the minimal level and size of variables being measured such as the number of physical institutions as access points and lending to MSMEs (financial depth).

Given the small scale of usage of financial services by target market segments and the low number of access points, the government should be cautious in expanding financial inclusion. The initiatives to promote inclusive finance, including the policy and institutional reforms, should be translated to actual usage of financial services while access points should reach the targeted market segments. Evidence-based data from all segments of the population will be useful in measuring the effectiveness of government programs and policies in the provision of a financial system that is accessible and responsive to the needs of the entire population, particularly the traditionally unserved or marginalized sectors, toward a broad-based inclusive growth.

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I. Introduction

Financial inclusion can be measured by the proportion of individuals and firms that use financial services (WB, 2014). Easy access to various financial services of low-income households, vulnerable, and less privileged people, in line with their specific needs and circumstances, is the critical objective of financial inclusion. Universal access to finance stimulates economic activities and allows micro, small, and medium-sized enterprises to develop, resulting in higher and greater income opportunities (Park and Mercado, 2015).

The G20[1] leaders endorsed financial inclusion as a key pillar of the global development agenda in 2010 while the United Nations' (UN) launched of the Sustainable Development Goals (SDGs) in 2015 highlights the role of financial inclusion in achieving the SDGs. Financial inclusion has transitioned from a mere strategy for poverty alleviation into being a central policy development area for achieving sustainable growth. Inclusive growth goes hand in hand with active policies and programs to reduce poverty (Todaro, 2012).

Financial inclusion or an inclusive financial system is "a state wherein there is effective access to a wide range of financial products and services by all". Basic financial services include savings, credit, payments, insurance, remittances and investments, among others, for different market segments including the unserved and underserved[2].

According to a study conducted by ADB in the Asia-Pacific region, a large population in the region still relies on informal financial services because of lack of access to formal institutions[3]. Population varies among countries, but it is estimated that around 70% to 80% of adults in the region have no access to formal financial system (Ayyagari and Beck, 2015).

[1] G-20 is an international forum for the governments and central bank governors from 20 major economies including Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, United States of America and the European Union.
[2] Unserved markets are those that do not have access to financial products and services (FPS) offered by formal financial service providers (FSP). Underserved markets are those that are served, but whose needs are not sufficiently met by FSPs. Among those included in these market segments are the low-income and marginalized, micro, small and medium enterprises (MSMEs), overseas Filipinos and their beneficiaries, agriculture and agrarian reform sectors, the youth women, indigenous people, persons with disabilities, among others.
[3] Formal institutions are those regulated financial service providers including banks, credit unions, cooperatives, finance companies, microfinance institutions (MFIs), or remittance and foreign exchanges offices.

As leaders and policymakers pursue different programs to promote financial inclusion and achieve universal access to finance, particularly for the traditionally unserved or marginalized sectors of the society, the activities changes the operations in the financial system such as the type of customers, the nature of transactions, the diversity of financial service providers and their business models and the regulations and supervisions of regulatory bodies. Changes in the interoperability between households, firms and government may impact the smooth operation of the financial system, which can either strengthen the financial system or contribute to financial instability.

In view of the foregoing, this study centers on two agenda, (1) to describe the extent of financial inclusion in the Philippines; and (2) to analyze the relationship between financial inclusion and financial stability such as the increase in financial inclusion contributes to financial stability of the Philippine banking system. The rest of the paper is organized as follows: Section II explains financial inclusion and financial stability and provides a literature review. Section III provides a theoretical framework used in our analysis. Section IV describes the Philippine financial system and current status of financial inclusion. Section V presents the data sources and methodology. Section VI discusses the findings. Section VII summarizes and some policy implications.

II. Review of Literature

A. Financial Inclusion

Country surveys report of financial inclusion in Asia by Asian Development Bank (ADB) revealed different approaches of each Asian country to advancing financial inclusion and its contribution to country's poor and low-income population. Similarly, the World Bank (WB) published its 2014 Global Financial Development Report (GFDR 2014) highlighting evidences from countries of the welfare benefits of financial inclusion in the reduction of poverty. Countries differ on their strategies based on each country's specifics and development. Both studies showed disparities on the level of inclusiveness across countries and can be attributed to country's institutional, legal and regulatory framework.

Financial inclusion is a broad concept and there is no standard method by which it can be measured. The WB and the International Monetary Fund (IMF) use

different indicators measuring financial inclusion. In 2012, the G20 released its G20 Basic Set of Financial Inclusion Indicators (Annex 1) that measures the dimension of access, usage and quality. It is an integration of the indicators utilized by the IMF and WB.

Access is the ability to use available financial services and products from formal institutions (Hannig and Jansen, 2010). Branch density indicators such as number of bank branches and number of ATMs provide basic information on access dimension of financial inclusion. The number of access points affects the degree to which individuals can do and use financial services that dictates the level or size of financial markets (financial depth).

Innovations in technology including mobile phones provide opportunity for widening access to financial inclusion. However, the development of new technologies does not automatically translate to increase financial inclusion. In cross-country comparisons, the correlation between mobile phone subscriptions and the use of mobile phones for payments and sending money is insignificant (WB, 2014). In the Philippines, mobile phones and Internet are two developments in information and communications technology (ICT) that created opportunities for branchless banking and real time access to bank accounts and financial services, including cash transfer, bills payment, and balance inquiry.

Usage focuses on the permanence and depth of financial services. It provides details about the regularity, frequency, and duration of use over time (Hannig and Jansen, 2010). Studies showed that account ownership is usually linked to income. The number of deposit and loan accounts in low-income countries showed positive growth but lower than corresponding rate in high-income countries. Furthermore, individuals in higher-income economies are more likely to borrow from formal sources, while those in lower-income economies rely more heavily on informal sources (WB, 2014).

Microfinance plays an important role in promoting inclusive finance since a large portion of households in poor and low-income countries are engage in micro and small entrepreneurial activities or microenterprises. In a study of small and medium enterprises (SMEs) sector in 99 countries, it showed that SMEs employ a large share of the workers in developing economies accounting for about 50% of employees in developing countries (Ayyagari, Demirguc-Kunt and Maksimovic, 2011). Other studies on the effects of microfinance showed positive effects on

consumption, economic self-sufficiency, and some aspects of mental health and well-being (WB, 2014).

Quality refers to the relevance of the financial service or product to consumers. It encompasses their experience, attitude and opinion towards financial service providers and financial services available.

B. Financial Inclusion and Financial Stability

IMF defines a financial system as institutions and markets that collectively provides framework for carrying out economic transactions and monetary policy supporting economic growth. Garry Schinasi from the IMF (2004) describes a stable financial system as "that which is capable of facilitating the performance of an economy and of dissipating financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events".

The interplay of different institutions and markets in the financial system affects financial stability. Financial inclusion changes the composition of the financial system in terms of transactions, clients, services and access points available. These changes either create potential new risks or shocks that tend to cause financial instability such as collective failure of smaller institutions that can significantly affect the stability in the system. On the other hand, financial inclusion could counter instability by rendering the financial system more diversified (Hannig and Jansen, 2010).

Morgan and Pontines (2014) verified the link between financial inclusion and financial stability using SME loans as a measure of financial inclusion and bank Z-scores and NPLs as measures of financial stability. Their study suggests that the two are mutually reinforcing. Their estimation results show that an increased share of lending to SMEs in total bank lending aids financial stability, mainly by a reduction of NPLs and a lower probability of default by financial institutions.

In contrast, the 2014 WGFD report of the WB showed that financial inclusion had no significant relationship with stability. The greater use of formal accounts (account penetration rate and lending deposit spread) is associated with higher efficiency in financial institutions. But there is no significant correlation between account penetration and financial stability. Similarly, cross-country data on financial markets showed that while financial inclusion was associated positively with depth

and efficiency it had no significant association with stability.

Related studies on microfinance revealed that the contribution of SMEs to productivity growth in developing economies is not as high as that of large firms. Cross-country evidence on the links between SMEs and economic growth and poverty alleviation suggests that the existence of a large SME sector does not promote growth in per capita gross domestic product (GDP) and SMEs do not exert a causal impact on growth and poverty (Beck, Demirgüç-Kunt, and Levine, 2004). Studies that explore the impact of microfinance on entrepreneurship find relatively modest effects. Many of the limitations of microcredit as a tool to finance entrepreneurship are likely to be the result of the rigidity of microcredit, including the lack of grace periods, frequent payments, and joint liability that may prevent risk taking (Giné, Jakiela, et.al., 2009).

III. Theoretical Framework

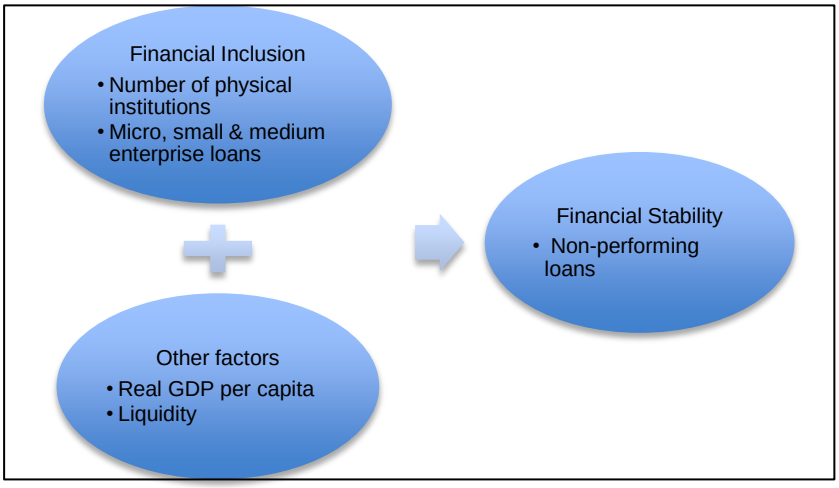
The four parameters through which financial inclusion can be measured are access, usage, quality and welfare. Access refers to supply and availability of financial products and services. Usage is the utilization of different products and services by households and businesses. Quality pertains to consumer experience and perception of relevance of a product or service. Welfare refers to the impact of a product or service on the lives of the consumer or the benefit to the person of accessing the service.

Figure 1. Parameters to measure financial inclusion

The number of physical institutions (phy) represents available access points for financial services. Lending to MSMEs (msme) provides information on the usage of financial services. Accordingly, increase in the number of access points and

lending to MSMEs improves the level of financial inclusion. The ratio of non-performing loans to total loans (npl) is an indicator of asset quality, a main driver of financial stability. Other variables may affect financial stability including the liquidity (liq) of the banking system and GDP per capita (lgdp). (See Annex 2 for the definition of variables)

Figure 2. Financial inclusion and financial stability relationship



IV. Status of Financial Inclusion in the Philippines

Financial inclusion in the Philippines is a national and institutionalized agenda. The Philippine Development Plan (PDP) 2011-2016 includes financial inclusion as one of the medium term agenda of the current administration. The National Strategy for Financial Inclusion (NSFI)[4] was launched in 2015 consisting of thirteen (13) government agencies that ensures national coordination in the design, implementation and monitoring of policies and programs relative to financial inclusion (BSP 2015). The government's own strategy map for inclusive finance focuses on areas: (a) policy, regulation and supervision for products, services and financial infrastructures; (b) financial education and consumer protection; (c) advocacy programs; and (d) data and measurement.

Financial inclusion initiatives started in the microfinance sector which developed products and services that reach out to the low-income clients or the poor

[4] The National Strategy for Financial Inclusion (NSFI) members are the Bangko Sentral ng Pilipinas, Departments of Finance, Education, Trade and Industry, Social Welfare and Development, Budget and Management, along with National Economic and Development Authority, Insurance Commission, Commission on Filipinos Overseas, Securities and Exchange Commission, Philippine Statistics Authority, Philippine Deposit Insurance Corporation and Cooperative Development Authority.

segments of the population. In 1997, the National Credit Council (NCC), a policymaking body created under the Department of Finance, formed the National Strategy for Microfinance which actively developed the microfinance industry. Legal framework was improved through the creation and amendment of various laws to enabling inclusive finance, including: Social Reform and Poverty Alleviation Act (1997), General Banking Law (2000) and Micro, Small and Medium Enterprise Law (2008). In 2011, the Philippines reaffirmed its commitment to promoting financial inclusion with its Maya Declaration[5] during the annual meeting of the Alliance for Financial Inclusion Group (AFI)[6].

The recent trend in the financial sector is the integration of microfinance in the operations of banks, credit cooperatives and other financial institutions. The government and its regulatory agencies continue to provide an enabling environment for inclusive finance through policy and institutional reforms. Similarly, the private sector continues to develop financial products and services that are suitable to different market segments and provide delivery channels that reach out to the underserved and unbanked areas of the country.

The Philippines participates in the global discussions of financial inclusion initiated by the Consultative Group to Assist the Poor (CGAP) and the AFI. It also works with international setting bodies in developing and implementing international standards and regulatory framework.

The Bangko Sentral ng Pilipinas (BSP), the country's central monetary authority and regulator of banks and non-bank financial institutions (NBFIs), plays an important role in realizing inclusive finance in the country. Banks dominate the financial sector accounting for 80.8% of the Philippine financial system (BSP 2015). The BSP also fully opened up the banking system to foreign participation in preparation to the Association of South East Asian Nations (ASEAN)[7] regional integration by 2018.

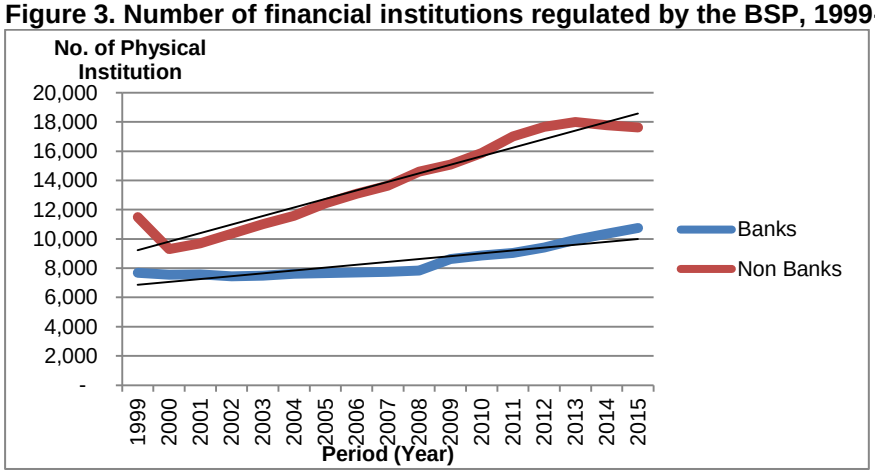
[5] The Maya Declaration is an agreement among 90 countries in the world (representing 75% of the world's unbanked population).
[6] Alliance for Financial Inclusion (AFI) is a global network of central banks and other financial inclusion policy making bodies in developing countries that provides its members with the tools and resources to share, develop and implement their knowledge of financial inclusion policies.
[7] The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967 in Bangkok, Thailand. The 10 member states of ASEAN include Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei Darussalam, Vietnam, Lao PDR, Myanmar and Cambodia.

1. Access

The Philippine financial system has become more inclusive over the years evidenced by the sustained expansion of network of banks, ATMs and other financial service providers (FSPs) (Annex 3). Financial inclusion index[8] of the country increased to 0.68 in 2014 from 0.66 in 2013, which indicates improvement in the overall state of financial inclusion.

The number of BSP-supervised institutions (BSFI), banks and non-banks, increased by 47.95% or an additional 9,196 access points over the period 1999-2015. In 1999, financial institutions totals 19,178 and spiraled to 28, 374 in 2015 comprised of 10,756 banks and 17,618 NBFIs[9]. In terms of the number of head offices and branches/agencies, NBFIs had a wider physical network than banks, consisting mainly of pawnshops. (Figure 3)

Figure 3. Number of financial institutions regulated by the BSP, 1999-2015



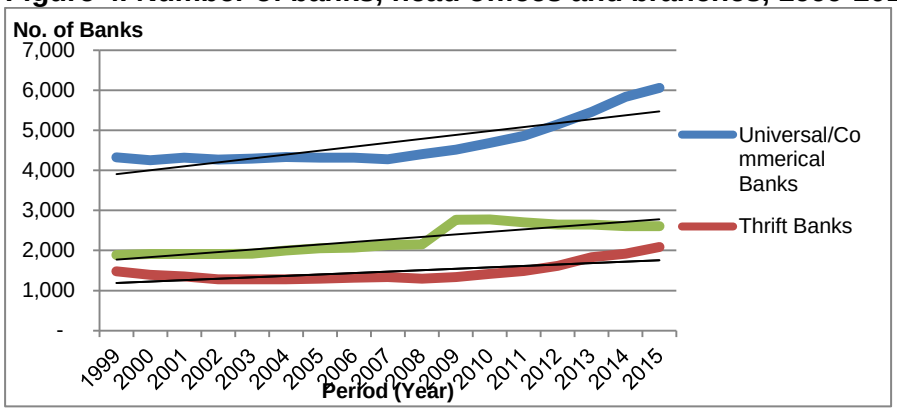
Source: http://www.bsp.gov.ph/banking/bspsup.asp

For the banking sector, there are wide disparities among universal/commercial banks (UKBs), thrift banks (TBs) and rural and cooperative banks (RCBs). UKBs accounts for 90% of total banks' assets and establishes majority of the head offices and branches. RCBs, banks meant to support the financial needs of low-income and marginalized households and small businesses have relatively lower number of offices compared to TBs and UKBs. The number of microfinance-oriented banks increased from 2 in 2001 to 31 in 2015 (Figure 4). Similarly, the ATM network, onsite and offsite, increased from 3,485 in 1999 to 17,317 in 2015.

[8] Financial inclusion index (FII) is a single number ranging from 0 (being the lowest) to 1 (being the highest) which takes into account the different dimensions of financial inclusion the FII is used in monitoring progress in financial inclusion and identifying geographical areas which may need attention. It is computed at the national, regional and provincial level. The methodology for FII construction followed the approach in the development of popular indices such as the Human Development Index and Human Poverty Index.

[9] Non-banks financial institutions include Investment Houses, Finance Companies, Investment Companies, Securities Dealers/Brokers, Pawnshops, Lending Investors, Non-Stock Savings and Loan Associations, Electronic Money Issuer and Remittance Agents.

Figure 4. Number of banks, head offices and branches, 1999-2015

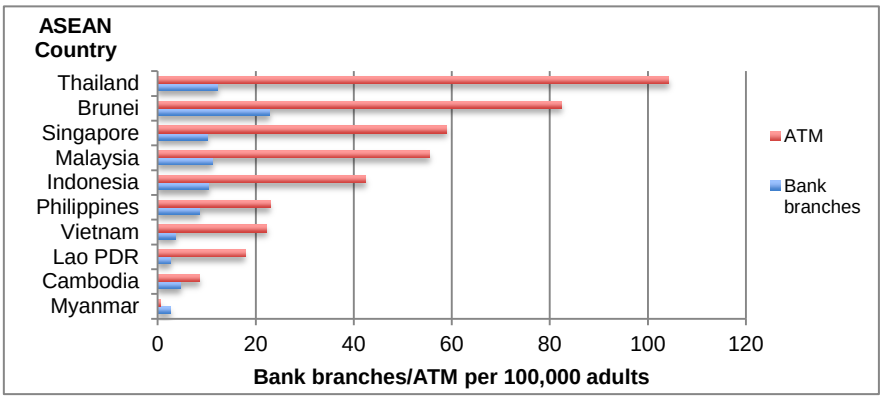


Source: http://www.bsp.gov.ph/banking/bspsup.asp

However, despite these increases in the number of banks and ATMs, the distribution is not proportional geographically as these are highly concentrated in populated and urban regions. The BSP reported that 37% of the 1,634 cities and municipalities in the Philippines do not have a banking office and 15% of total population lives in unbanked cities and municipalities (BSP 2013). The National Capital Region (NCR) has 0% unbanked cities and municipalities. Southern Tagalog (CALABARZON) region has only 6% followed by Central Luzon with only 8%. The percentage of unbanked cities and municipalities is higher in Autonomous Region of Muslim Mindanao (ARMM), 93%; Eastern Visayas, 71%; and Central Autonomous Region (CAR), 65%. Accordingly, establishing bank branches in these cities and municipalities remains a challenge due to low population density, geographic inaccessibility, and geo-political and socio-economic situations. Despite these constraints, UKBs continue to establish branches in areas dominated by rural banks to support inclusive growth by providing access to finance for all Filipinos.

Compared with neighboring ASEAN countries, the Philippines lags behind Singapore, Indonesia, Malaysia, Thailand and Brunei but fares better than Myanmar, Lao PDR, Vietnam and Cambodia both in the number of banks and ATMs. (Annex 4)

Figure 5. Number of bank branches and ATMs per 100,000 adults, 2011



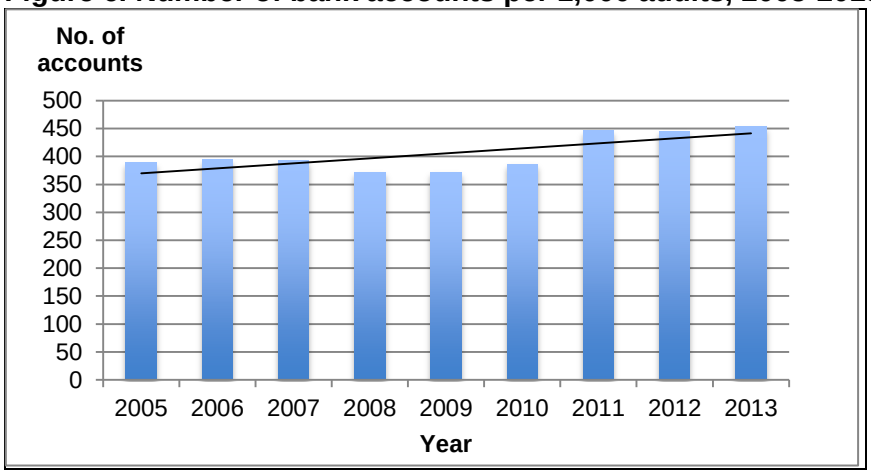
Source: http://databank.worldbank.org/data/reports.aspx

Access to financial services remains a challenge in the Philippines. Alternative FSPs such as pawnshops, remittance agents, money changers/foreign exchange dealers and mobile banking agents contribute to the decrease of unserved population. Based on recent BSP data, 55% of population (95% are poor) uses services of alternative FSPs.

2. Usage

Effective access forms a precondition for usage. Accounts are key measure of financial inclusion because formal financial activities are tied to accounts the customer have. The number of bank accounts per 1,000 Filipino adults increased moderately from 388 in 2005 to 454 accounts in 2013. (Annex 5)

Figure 6. Number of bank accounts per 1,000 adults, 2005-2013

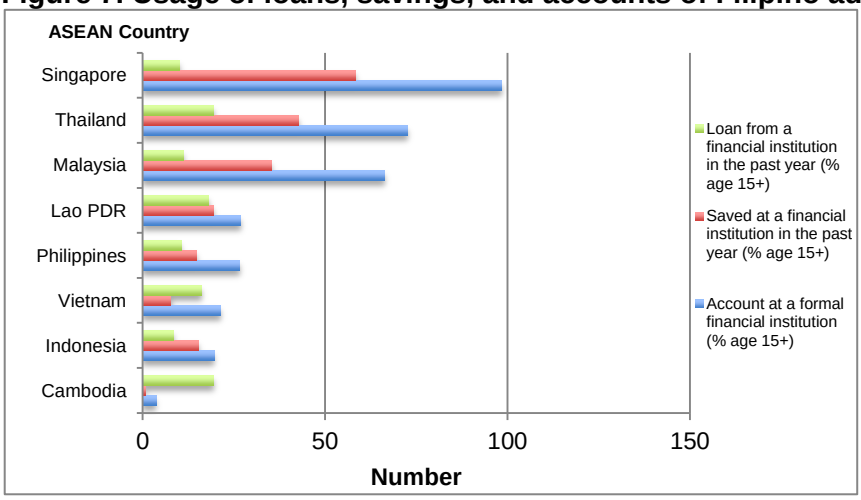


Source: http://databank.worldbank.org/data/reports.aspx

In terms of usage of financial services at a formal institution, the BSP reported that 47% of Filipino adults borrowed money from formal financial institutions; 24.5% Filipinos saved money; and 31.3% Filipinos had accounts at formal financial institutions (BSP 2015).

However, the usage of the Filipino adults is lower compared with other ASEAN countries except for Vietnam in terms of savings, with Indonesia on loans and number of accounts and with Cambodia on savings and number of accounts. (Annex 6)

Figure 7. Usage of loans, savings, and accounts of Filipino adults, 2011



Source: http://databank.worldbank.org/data/reports.aspx

Based on the WB FINDEX database, 58% of Filipino adults have loans but only 11% used formal institution' facilities. The NBSFI of the BSP indicates that majority of loans are short term and for immediate consumption. This data suggests that majority of Filipinos still relies on informal sources for their immediate financial needs. The survey also showed that many poor people are constraint to accessing formal financial institutions because they do not have proper identification documents, which are pre-requisite to opening a banking account. They do not have savings and other assets or collateral documents and history of formal credit that can be used by banks in assessing their credit worthiness. 65% of Filipino adults cited lack of enough money as main reason for not having a bank account.

3. Quality

The NBSFI showed that more than 50% of Filipino adults are satisfied with their transactions with banks and ATMs (access points). Problems with use of access points are usually experienced in ATMs. There are various channels from which they source information about fees such as notices/flyers/brochures, signage/billboards, bank staff and word of mouth. Majority of the Filipino adults perceived the financial charges as appropriate for their transactions.

4. Welfare

The NBSFI revealed the perception of Filipino adults to financial services. 86% of Filipino adults surveyed believe that financial products and services is important, 88% said that it is beneficial while 87% of the surveyed adults wanted to access formal financial institutions. In terms of savings, 97% Filipino adults believe that savings is important and 80% of the surveyed expressed desire to save.

The BSP reported in its 2015 Status Report of the Philippine Banking System that consumer lending is increasing. Banks continued to provide credit to micro, small and medium enterprises (MSMEs) under Republic Act (R.A.) No. 6977, otherwise known as the "Magna for Small and Medium Enterprises" (as amended by R.A. Nos. 8289 and 9501) which mandates all lending institutions to set aside a portion of their total loan portfolio and make it available for small enterprise credit, particularly, 8 percent for micro and small enterprises (MSEs) and 2 percent for medium enterprises (MEs). However, the banking system failed to comply with the aforementioned law as the banking system's overall compliance ratio is only 9.8 percent, with 5.6 percent compliance ratio for MEs and 4.2 percent compliance ratio for MSEs. Rural and cooperative banks (R/CB) industry continued to cater to the needs of MSMEs as compliance ratio of credit allocation to MSEs stands at 22 percent while the universal and commercial banks (U/KBs) and thrift banks (TBs) compliance ratios fall below the statutory floor.

The continued expansion of the loan portfolio does not strain the asset quality of the banking system as gross non-performing loans (NPLs) remains low.

V. METHODOLOGY

A. Nature and Sources of Data

The financial inclusion data used to describe the extent of financial inclusion were sourced from the BSP and the WB, such as: (a) National Baseline Survey for Financial Inclusion (NBSFI) [10] ; (b) Philippine Banking Statistics; (c) World Development Indicators Database; and (d) Global Financial Development Database.

To determine the link between financial inclusion and financial stability, the study used quarterly data for the period 2002:4 to 2015:4. Indicators for financial inclusion and financial stability were sourced from the BSP such as: (a) number of physical banking institutions (phy); (b) loans to MSMEs (msme); (c) NPL as a proportion of gross loans (npl); (d) liquid assets to deposits (liq). Data on gross domestic product per capita (gdp) was sourced from the National Statistical Coordination Board (NSCB). We take the log of GDP per capita while NPLs are deseasonalized.

[10] The National Baseline Survey on Financial Inclusion is a survey of 1,200 adults defined as individuals aged 15 years old and above from across the Philippines (i.e., National Capital Region, Luzon, Visayas and Mindanao). Data collection was done through face-to-face interviews using structured questionnaire designed by the Inclusive Finance Advocacy Staff (IFAS) of the BSP.

B. Parameters and Model

The data on financial inclusion were categorized based on the parameters suggested by the AFI such as: access, usage, quality and welfare.

To analyze the link between financial inclusion and financial stability, the study used a reduced-form vector autoregressive (VAR) model in estimating the impact of variables such as *phy, msme, liq, and lgdp to npl*. A reduced-form VAR expresses each variable as a linear function of its own past values and the past values of all other variables being considered.

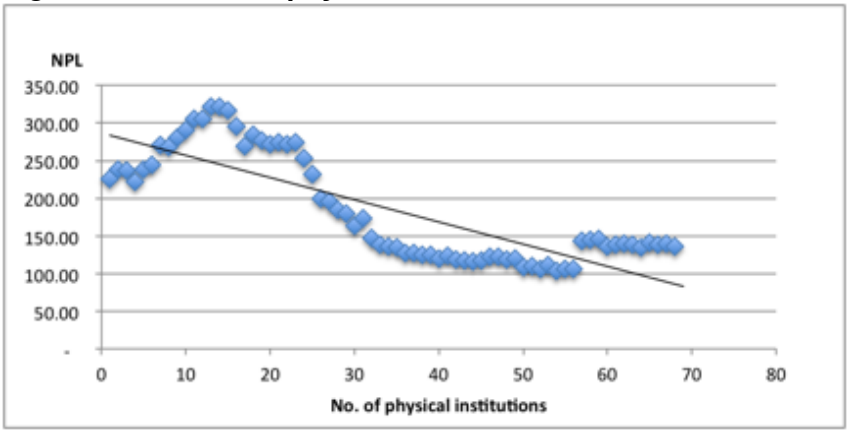
Diagnostics tests such as lag lengths and stability of the VAR model were performed to check the robustness of the model. Contemporaneous relationships were analyzed using the Impulse Response function applying the Cholesky decomposition.

VI. Results and Discussions

A. Stylized Facts on Financial Inclusion and Financial Stability

Simple comparison of the relationship between measures of financial inclusion and stability revealed that there are correlations between the two. The downward relationship between NPLs and the number of physical institutions (access points) implies that an increase in access points tends to reduce bank NPLs (Figure 8) (Annex 7).

Figure 8. Number of physical institutions vs. NPLs, 1999-2015

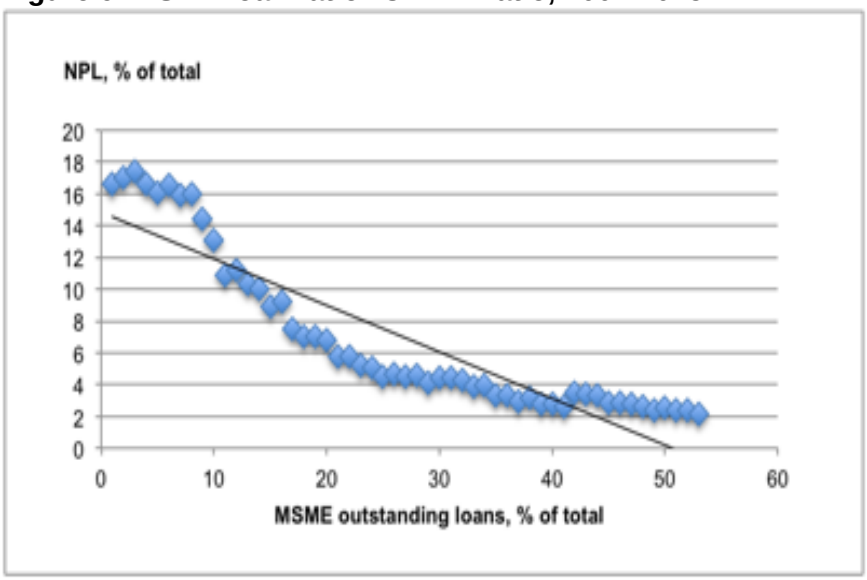


Source: http://www.bsp.gov.ph/banking/bspsup.asp

As banks increase their branch network, credits becomes available and reach new markets including the previously underserved and unbanked population. The additional physical institutions contribute to banks cost-efficiency measures. Instead of accumulating problem loans, banks tend to be efficient in managing their credit risk resulting to lower NPL.

Similarly, expansion of MSME loans tends to reduce the ratio of banks' NPLs to total bank loans (Figure 9) (Annex 8). Clients are usually from the lower and middle income sector and are subjected to stricter credit underwriting requirements and monitoring. The diversification of the loan portfolio by lending to MSMEs improves the credit granting process of banks through improved risk management tools and monitoring standards which results to lower NPL ratio.

Figure 9. MSME loan ratio vs. NPL ratio, 2002-2015



Source: http://www.bsp.gov.ph/banking/bspsup.asp

B. Model and Results

Table 1 summarizes and describes the 5 variables with 53 observable data from period 2002:4 to 2015:4 (Annex 9). The mean is the average or the central tendency, maximum and minimum are the maximum and minimum numbers appearing on the observations while standard deviation measures how the observations are spread.

Table 1. Descriptive statistics

Variable	Mean	Maximum	Minimum	Standard Deviation
NPL	6.94	17.85	2.28	4.99
PHY	36.99	41.86	34.52	2.11
MSME	16.22	24.27	9.82	3.67
LIQ	54.62	60.22	45.50	3.48
LGDP	9.61	9.91	9.33	0.14

Lag lengths

Lag length is 1 based on Schwartz Criterion (SC). The other criterion, Akaike Information Criterion (AIC), indicates the use of 4 lags, however, when estimation was performed, the VAR model failed in the second diagnostic check of stability.

Stability of the VAR Model

The VAR model is stable as the inverse of the roots of the characteristics polynomials are all inside the unit circle.

Impulse Response Function (See Annexes 10 and 11 for the VAR estimation results and complete impulse response results for each variable)

The impulse response function, which provides empirical evidence on the response of variables to policy impulses, was performed using the Choleski decomposition. Such decomposition imposes strict causal ordering in the contemporaneous relationship between the variables. The variable ordered last is the one most affected by other variables. The ordering considered the causal impact of variables. Presence of physical institutions in a locality (phy) allows access of borrowers to financial services including micro, small and medium enterprise loans (msme). The volume of msme loans affects the flow of liquidity (liq) of banks. A banking sector with a strong liquidity position has greater capacity to meet demands of market. The expansion or contraction of liquid assets must be managed by banks to ensure that it will not give shocks to the financial system. The level of liquidity in the banking system impacts the economic activity in the country measured by real GDP per capita (lgdp). All previously mentioned variables will affect the demand for loans from the banking sector. The economic condition of borrowers, the policies of

the banking sector and the government affect the asset quality of loans (npl).

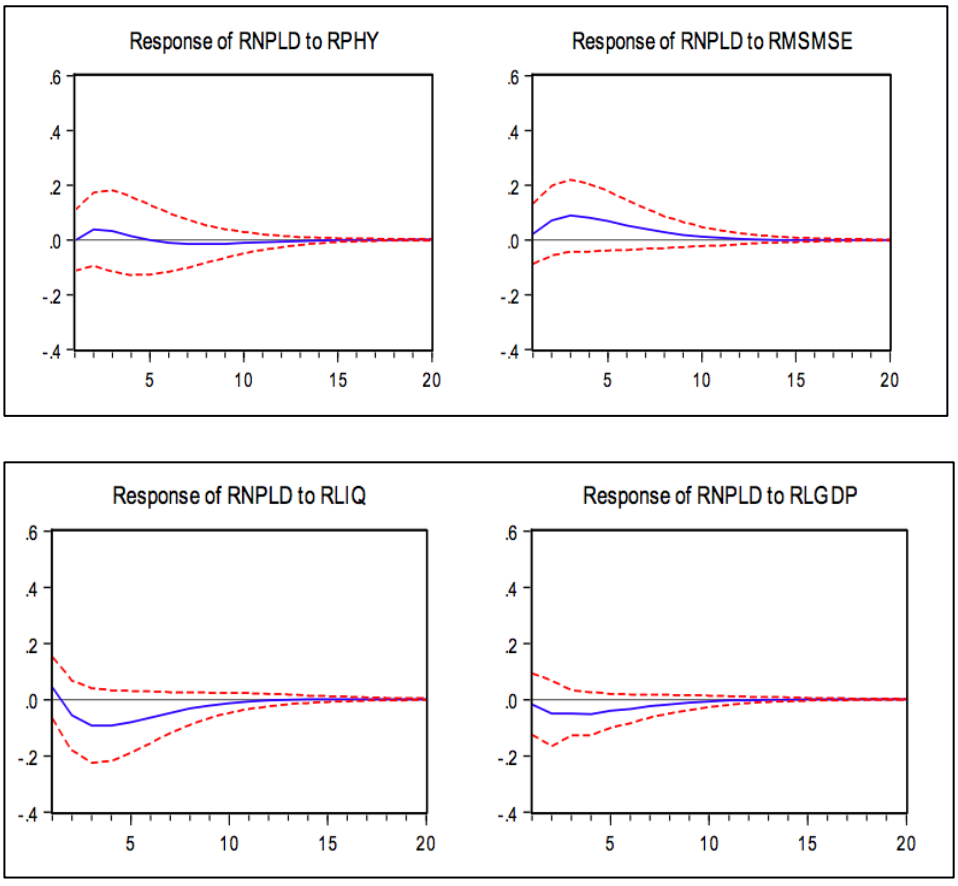
Cholesky ordering: phy, msme, liq, lgdp, npl

The impulse response can change if the ordering is changed. Further, there might be a theoretical reason to suppose that one variable has no contemporaneous effect on the other variables.

To analyze the relationship whether increase in financial inclusion leads to better financial stability, the responses of financial inclusion measures such as physical access (phy) and lending to MSMEs (msme) and other variables such as liquidity (liq) and GDP per capita (gdp) to non-performing loans (npl) as a measure of financial stability were identified.

Following were the result of estimating the impact of variables such as *phy, msme, liq, and lgdp to npl using the* impulse response.

Figure 10. Response to Cholesky one S.D. innovations ± 2 S.E.



The results showed no contemporaneous relationship between NPL and

number of physical institutions, lending to MSMEs, liquidity and GDP. There is no sufficient evidence to conclude that greater financial inclusion improves financial stability. At this point, financial inclusion neither improves financial stability nor results to financial instability. It can be attributed to the minimal level and size of variables being measured such as the number of physical institutions and lending to MSMEs (financial depth). Although the trends are increasing, its contribution in general in the banking system is not significant as of this point to impact financial stability. Access points are limited and concentrated in urban areas while MSME lending ranges only between 10 - 20% of the loan portfolio of the banking system.

VII. Summary and Policy Implications

Financial inclusion is the state wherein there is effective access to a wide range of financial products and services such as savings, credit, payments, insurance, remittances and investments. Easy access to various financial services, in line with the specific needs and circumstances of low-income households, vulnerable, and less privileged people, which tend to concentrate in rural areas, is the critical objective of financial inclusion. The launched of the United Nations' (UN) Sustainable Development Goals (SDGs) in 2015 highlights the role of financial inclusion as a central policy development area for achieving sustainable growth.

Countries adopt different approaches in pursuit of universal access to finance depending on their country-specific situations and constraints. There have been evidences of developments but wide disparities among countries are likewise evident. This defines the effectiveness of the initiatives and policies of the countries in relation to financial inclusion.

In the Philippines, where the financial system is bank-dominated, financial inclusion is an institutionalized agenda. It is a platform to providing better lives to Filipinos. The country has achieved milestones in the development of financial inclusion since it initially put up strategies to improving access to finance in 1997. National strategies and policies were further enhanced with focus on areas of policy, regulation and supervision; financial education and consumer protection; advocacy programs; and data and measurement. However, there are still opportunities for improvements to ensure that demands for access to finance are met. Overall, the level of financial inclusion is still far from other developing countries or ASEAN neighbor countries. The regulatory framework must continue to be responsive to

both suppliers and users of financial services and be an enabler of development of financial inclusion.

The current financial inclusion in the Philippines has yet to impact the financial stability in the country. Increase financial inclusion at its current level neither improves financial stability nor results to financial instability. There is no sufficient evidence to make definitive conclusion on the relationship between financial inclusion and financial stability. The study showed no contemporaneous relationship of NPL with number of physical institutions, lending to MSMEs, liquidity and GDP. It can be attributed to the minimal level and size of variables being measured such as the number of physical institutions as access points and lending to MSMEs (financial depth).

Given the small scale of usage of financial services by target market segments and the low number of access points, the government should be cautious in expanding financial inclusion. The initiatives to promote inclusive finance, including the policy and institutional reforms, should be translated to actual usage of financial services while access points should reach the targeted market segments. Evidence-based data from all segments of the population will be useful in measuring the effectiveness of government programs and policies in the provision of a financial system that is accessible and responsive to the needs of the entire population, particularly the traditionally unserved or marginalized sectors, toward a broad-based inclusive growth.

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ANNEXES

Annex 1. G20 basic set of financial indicators

Indicators	Dimension	Source
% of adults with an account at a formal financial institution	Usage	WB Global Findex
Number of depositors per 1,000 adults OR number of deposit accounts per 1,000 adults	Usage	IMF Financial Access Survey
% of adults with at least one loan outstanding from a regulated financial institution	Usage	WB Global Findex
Number of borrowers per 1,000 adults OR number of outstanding loans per 1,000 adults	Usage	IMF Financial Access Survey
Number of insurance policy holders per 1000 adults.	Usage	IMF Financial Access Survey
Number of retail cashless transactions per capita.	Usage	WB Global Payments System Survey
% of adults that use their mobile device to make a payment	Usage	WB Global Findex
% of adults with high frequency use of formal account.	Usage	WB Global Findex
Saved at a financial institution in the past year.	Usage	WB Global Findex
% of adults receiving domestic and international remittances	Usage	WB Global Findex
% of SMEs with an account at a formal financial institution	Usage	WB Enterprise Surveys
Number of SMEs with deposit accounts/number of deposit accounts OR number of SME depositors/number of depositors	Usage	IMF Financial Access Survey
% of SMEs with outstanding loan or line of credit	Usage	WB Enterprise Surveys
Number of SMEs with outstanding loans/number of outstanding loans OR number of outstanding loans to SMEs/number of outstanding loans	Usage	IMF Financial Access Survey
Number of branches per 100,000 adults	Access	IMF Financial Access Survey
Number of ATMs per 100,000 adults	Access	IMF Financial Access Survey
Number of POS terminals per 100,000 inhabitants.	Access	WB Global Payments System Survey
Number of e-money accounts for mobile payments	Access	WB Global Payments System Survey
Interoperability of ATMs and	Access	WB Global Payments System Survey
Interoperability of POS terminals	Access	WB Global Payments System Survey
Financial knowledge score.	Quality	WB Financial Capability Surveys
Source of emergency funding	Quality	WB Global Findex
Disclosure index combining existence of a variety of disclosure requirements:	Quality	WB Global Financial Consumer Protection Survey
Index reflecting the existence of formal internal and external dispute resolution mechanisms	Quality	WB Global Financial Consumer Protection Survey
Average cost of opening a basic current account.	Quality	WB Global Payments System Survey
Average cost of maintaining a basic bank current account (annual fees).	Quality	WB Global Payments System Survey
Average cost of credit transfers.	Quality	WB Global Payments System Survey
% of SMEs required to provide collateral on their last bank loan (reflects the tightness of credit conditions)	Quality	WB Enterprise Surveys
Getting credit: Distance to frontier	Quality	WBG Doing Business

Annex 2. Definition of variables

Variable	Definition
Physical institutions (phy)	The proportion of head office and other offices of financial institutions such as universal and commercial banks, thrift banks and rural and cooperative banks including microfinance-oriented banks over all financial institutions supervised/regulated by the Bangko Sentral ng Pilipinas (BSP).
MSME loans as a proportion of total outstanding loans refers to lending to MSME (msme)	MSME represents firms that are focus of financial inclusion policies and programs in the Philippines. Micro, small and medium enterprises refers to any business activity within the major sectors of the economy, namely: industry, trade, services, including the practice of one's profession, the operation of tourism-related establishments, and agri-business involving the manufacturing, processing, and/or production of agricultural produce, whether single proprietorship, cooperative, partnership or corporation – whose total assets fall under the following categories: a) Micro: not more than P3,000,000.00; (b) Small: more than P3,000,000.00 to P15,000,000.00; and (c) Medium: more than P15,000,000 to P100,000,000.
Non-performing loan ratio (npl)	Used as a proxy for asset quality. It is the ratio of defaulting loans (payments of interest and principal past due by 90 days or more) to total gross loans (total value of loan portfolio). It therefore measures the credit quality of loan portfolios. High NPL ratios over time increase the vulnerabilities of the banking system to shocks, which may negatively affect stability of the financial system.
Liquid assets to deposits (liq)	It is essential for liquidity management. It refers to the ratio of Liquid Assets to Deposits Liabilities. Liquid Assets refers to the sum of (a) Cash and Due from Banks and (b) Financial Assets. Banks must manage liquidity stocks and flows in the most profitable manner. Banks with more liquid assets or those that are net-lenders in the interbank markets are more stable.
Real GDP (lgdp)	A measure of economic activity and development adjusted for price changes. GDP per capita gross domestic product divided by population. Real GDP per capita is log to easily see the difference between values (lgdp).

Annex 3. Number of financial institutions and ATMs, 1999-2015

Physical institutions (Banks, Quarterly)

Period	No. of Physical Institution		Period	No. of Physical Institution		Period	No. of Physical Institution		Period	No. of Physical Institution
Mar-99	7663		Mar-04	7509		Mar-09	7876		Mar-14	10020
Jun-99	7653		Jun-04	7570		Jun-09	7898		Jun-14	10120
Sep-99	7665		Sep-04	7593		Sep-09	7914		Sep-14	10207
Dec-99	7693		Dec-04	7612		Dec-09	8620		Dec-14	10361
Mar-00	7640		Mar-05	7613		Mar-10	8663		Mar-15	10456
Jun-00	7638		Jun-05	7624		Jun-10	8685		Jun-15	10528
Sep-00	7627		Sep-05	7653		Sep-10	8740		Sep-15	10615
Dec-00	7554		Dec-05	7670		Dec-10	8877		Dec-15	10756
Mar-01	7546		Mar-06	7672		Mar-11	8870		-	-
Jun-01	7555		Jun-06	7693		Jun-11	8915		-	-
Sep-01	7572		Sep-06	7679		Sep-11	8965		-	-
Dec-01	7585		Dec-06	7710		Dec-11	9050		-	-
Mar-02	7587		Mar-07	7704		Mar-12	9186		-	-
Jun-02	7492		Jun-07	7738		Jun-12	9207		-	-
Sep-02	7460		Sep-07	7736		Sep-12	9301		-	-
Dec-02	7454		Dec-07	7744		Dec-12	9410		-	-
Mar-03	7465		Mar-08	7743		Mar-13	9477		-	-
Jun-03	7448		Jun-08	7769		Jun-13	9543		-	-
Sep-03	7469		Sep-08	7811		Sep-13	9720		-	-
Dec-03	7494		Dec-08	7848		Dec-13	9935		-	-

BSP- supervised financial institutions, 1999-2015

YEAR	BANKS				NON-BANKS	TOTAL
	Universal/ Commercial Banks (UKBs)	Thrift Banks (TBs)	Rural & Cooperative Banks (RCBs)	Subtotal		
1999	4326	1478	1889	7,693	11,485	19,178
2000	4,250	1,391	1,913	7,554	9,308	16,862
2001	4320	1351	1914	7,585	9,709	17,294
2002	4265	1278	1911	7,454	10,352	17,806
2003	4296	1277	1921	7,494	11,011	18,505
2004	4329	1280	2003	7,612	11,585	19,197
2005	4318	1293	2059	7,670	12,438	20,108
2006	4313	1322	2075	7,710	13,101	20,811
2007	4275	1336	2133	7,744	13,650	21,394
2008	4404	1296	2148	7,848	14,605	22,453
2009	4520	1333	2767	8,620	15,081	23,701
2010	4681	1418	2778	8,877	15,875	24,752
2011	4857	1491	2702	9,050	17,007	26,057
2012	5145	1619	2646	9,410	17,671	27,081
2013	5461	1828	2646	9,935	18,004	27,939
2014	5833	1920	2608	10,361	17,774	28,135
2015	6060	2086	2610	10,756	17,618	28,374

Automated Teller Machines (ATMs)

Year	ATM		Year	ATM
1999	3,485		2008	7,741
2000	3,680		2009	8,458
2001	3,995		2010	9,370
2002	4,328		2011	10,659
2003	4,573		2012	12,225
2004	5,469		2013	14,530
2005	6,212		2014	15,695
2006	6,867		2015	17,317
2007	7,155		-	-

Annex 4. Number of bank branches and ATM per 100,000 adults (ASEAN), 2011

COUNTRY	Branches		ATMs	
	2005	2013	2005	2013
Brunei Darussalam	25.99378395	22.87080956	43.57781601	82.33491516
Cambodia	-	4.764226437	0.011710628	8.462127686
Indonesia	5.324225903	10.40093517	9.412050247	42.40338516
Lao PDR	1.569344997	2.733916998	0.342402488	17.85224342
Malaysia	12.50260162	11.27911854	27.13519478	55.50035095
Myanmar	1.610162616	2.565202236	-	0.56779182
Philippines	8.049434662	8.625715256	11.50289536	22.95030975
Singapore	11.51085091	10.16412926	49.40677643	58.95645905
Thailand	8.363109589	12.15742683	29.62441826	104.3206406
Vietnam	-	3.715451479	2.964304209	22.29417038

Annex 5. Number of bank accounts per 1,000 adults (Philippines), 2005-2013

Year	No. of accounts
2005	388.256012
2006	394.561615
2007	391.8381958
2008	371.8110352
2009	371.9793701
2010	386.3826294
2011	446.3991699
2012	445.278717
2013	453.5129089

Annex 6. % Usage of loans, savings, and accounts of adults age 15+ (ASEAN), 2011

COUNTRY	Account at a formal financial institution	Saved at a financial institution in the past year	Loan from a financial institution in the past year	Loan in the past year
Brunei Darussalam	-	-	-	-
Cambodia	3.659712076	0.80870831	19.47153091	59.54059982
Indonesia	19.58198929	15.28831959	8.547714233	49.1144104
Lao PDR	26.77346039	19.36097908	18.13393974	32.53369904
Malaysia	66.17381287	35.40678024	11.19655037	32.54523849
Myanmar	-	-	-	-
Philippines	26.55592918	14.71312046	10.5145998	58.13203812
Singapore	98.22189331	58.40990067	9.991624832	32.70883942
Thailand	72.66644287	42.80260086	19.39599037	27.15802956
Vietnam	21.36948967	7.740848064	16.17791939	43.93122864

Annex 7. Non-performing loans (in billion pesos), 1999-2015

Period	NPLs, in billions		Period	NPLs, in billions		Period	NPLs, in billions		Period	NPLs, in billions
Mar-99	225.40		Mar-04	274.19		Mar-09	123.02		Mar-14	138.70
Jun-99	238.28		Jun-04	271.41		Jun-09	119.08		Jun-14	139.83
Sep-99	236.82		Sep-04	274.44		Sep-09	117.59		Sep-14	138.71
Dec-99	221.97		Dec-04	252.86		Dec-09	115.42		Dec-14	134.83
Mar-00	238.84		Mar-05	232.28		Mar-10	116.79		Mar-15	141.41
Jun-00	243.99		Jun-05	199.25		Jun-10	122.29		Jun-15	138.33
Sep-00	270.12		Sep-05	195.44		Sep-10	122.22		Sep-15	139.74
Dec-00	268.69		Dec-05	185.03		Dec-10	118.28		Dec-15	136.50
Mar-01	281.21		Mar-06	180.04		Mar-11	120.16		-	-
Jun-01	290.76		Jun-06	163.88		Jun-11	109.09		-	-
Sep-01	305.67		Sep-06	172.73		Sep-11	109.15		-	-
Dec-01	305.79		Dec-06	147.18		Dec-11	106.15		-	-
Mar-02	321.47		Mar-07	138.61		Mar-12	110.76		-	-
Jun-02	321.47		Jun-07	135.63		Jun-12	103.57		-	-
Sep-02	316.53		Sep-07	135.08		Sep-12	105.54		-	-
Dec-02	295.20		Dec-07	127.73		Dec-12	105.66		-	-
Mar-03	269.62		Mar-08	126.64		Mar-13	143.53		-	-
Jun-03	284.52		Jun-08	124.43		Jun-13	144.67		-	-
Sep-03	276.31		Sep-08	124.38		Sep-13	145.93		-	-
Dec-03	271.40		Dec-08	120.00		Dec-13	135.54		-	-

Annex 8. Micro, small and medium enterprise loans, 2002-2015

Period	MSE Loans as a % of Total Outstanding Loans (a)	ME Loans as a % of Total Outstanding Loans (b)	MSME Loans as a % of Total Outstanding Loans (a+b)		Period	MSE Loans as a % of Total Outstanding Loans (a)	ME Loans as a % of Total Outstanding Loans (b)	MSME Loans as a % of Total Outstanding Loans (a+b)
Dec-02	14.13	10.14	24.27058201		Mar-10	8.39	7.66	16.05942987
Mar-03	13.14	9.62	22.76040377		Jun-10	8.66	7.86	16.51992327
Jun-03	11.79	9.58	21.37524508		Sep-10	8.17	7.32	15.4914119
Sep-03	10.66	10.30	20.95474673		Dec-10	8.46	7.94	16.40249149
Dec-03	10.42	10.01	20.43361451		Mar-11	8.04	7.37	15.4143054
Mar-04	10.64	9.93	20.57003529		Jun-11	8.23	7.42	15.64903406
Jun-04	10.62	10.04	20.66035232		Sep-11	7.37	7.09	14.45821567
Sep-04	10.42	9.99	20.41191484		Dec-11	7.56	7.58	15.147575
Dec-04	10.39	10.09	20.48266405		Mar-12	6.61	6.50	13.11276929
Mar-05	9.84	9.57	19.4118832		Jun-12	6.87	7.12	13.98739096
Jun-05	9.66	9.23	18.88471561		Sep-12	6.37	6.58	12.94317671
Sep-05	9.79	8.84	18.62696081		Dec-12	6.39	6.92	13.31164363
Dec-05	10.23	9.77	20.00481383		Mar-13	5.85	6.26	12.11196432
Mar-06	9.37	8.84	18.20480931		Jun-13	6.09	6.44	12.52492891
Jun-06	9.58	8.68	18.25832138		Sep-13	6.00	6.66	12.66373439
Sep-06	9.51	8.35	17.85893031		Dec-13	5.59	6.10	11.69399564
Dec-06	9.31	7.87	17.17731377		Mar-14	5.15	5.60	10.74304808
Mar-07	9.22	7.62	16.84504269		Jun-14	4.67	5.83	10.50295774
Jun-07	9.40	7.80	17.20137961		Sep-14	4.64	5.68	10.32378633
Sep-07	9.65	8.06	17.71520894		Dec-14	4.90	6.10	10.99464233
Dec-07	9.47	8.47	17.93591559		Mar-15	4.33	5.52	9.852120613
Mar-08	9.90	7.54	17.43912838		Jun-15	4.37	5.59	9.961723009
Jun-08	8.98	7.90	16.87993142		Sep-15	4.20	5.62	9.819779894
Sep-08	8.63	8.13	16.76282714		Dec-15	4.35	6.19	10.54254723
Dec-08	9.60	8.85	18.45306056					
Mar-09	9.31	7.91	17.22495981					
Jun-09	9.48	8.18	17.66083938					
Sep-09	9.25	7.72	16.97331176					
Dec-09	9.70	8.20	17.8960151					

Annex 9. Raw data of variables

Period	NPLD	PHY	LIQ	LGDP*		Period	NPLD	PHY	LIQ	LGDP*
Dec-02	16.72	41.86	47.7	9.543821		Mar-10	4.29	36.25	57.27	10.011688
Mar-03	16.85	41.67	47.2	9.407831		Jun-10	4.41	36.08	54.94	10.098389
Jun-03	17.85	41.28	46.2	9.439694		Sep-10	4.23	35.89	57.17	10.063239
Sep-03	16.22	40.86	45.5	9.456551		Dec-10	4.09	35.86	59.72	10.208821
Dec-03	16.22	40.50	47.9	9.603817		Mar-11	3.80	35.53	60.22	10.076835
Mar-04	16.33	40.30	50.1	9.501063		Jun-11	3.33	35.06	57.03	10.151630
Jun-04	16.39	40.20	52.1	9.549963		Sep-11	3.24	34.87	58.80	10.106366
Sep-04	15.54	39.96	52.3	9.568532		Dec-11	3.14	34.73	56.46	10.255665
Dec-04	14.55	39.65	53.2	9.714085		Mar-12	2.99	34.80	56.35	10.133719
Mar-05	12.97	39.32	56.8	9.587918		Jun-12	2.78	34.52	54.67	10.210775
Jun-05	11.26	39.07	55	9.647231		Sep-12	2.76	34.93	57.45	10.182050
Sep-05	10.79	38.56	54.8	9.655890		Dec-12	2.77	34.75	57.50	10.328691
Dec-05	10.50	38.14	53	9.806216		Mar-13	3.38	34.82	58.80	10.204467
Mar-06	9.91	38.34	54.5	9.683836		Jun-13	3.38	34.83	57.96	10.278593
Jun-06	9.15	37.98	56.5	9.727235		Sep-13	3.27	35.15	58.77	10.255133
Sep-06	8.82	37.38	55	9.737406		Dec-13	3.03	35.56	59.47	10.402795
Dec-06	7.74	37.05	55	9.880944		Mar-14	2.76	35.84	58.58	10.275489
Mar-07	6.93	38.35	52.9	9.757730		Jun-14	2.73	36.16	57.05	10.358462
Jun-07	7.11	36.84	57.4	9.813321		Sep-14	2.61	36.43	55.49	10.323445
Sep-07	6.53	36.63	58.4	9.804044		Dec-14	2.54	36.83	55.67	10.479165
Dec-07	6.05	36.20	52	9.964182		Mar-15	2.46	37.03	55.33	10.310278
Mar-08	5.67	36.02	54.59	9.856787		Jun-15	2.36	37.30	54.99	10.394424

Jun-08	5.24	35.92	51.92	9.963373		Sep-15	2.34	37.54	55.74	10.350052
Sep-08	4.91	35.58	51.96	9.963167		Dec-15	2.28	37.91	53.58	10.513103
Dec-08	4.73	34.95	52.53	10.076075		-	-	-	-	-
Mar-09	4.59	34.77	51.63	9.903458		-	-	-	-	-
Jun-09	4.51	34.65	52.51	9.984069		-	-	-	-	-
Sep-09	4.45	34.58	54.31	9.971543		-	-	-	-	-
Dec-09	4.32	36.37	52.67	10.128974		-	-	-	-	-

**LGDP is the result of getting the log of GDP per capita (see Annex 9.1)*

Annex 9.1. GDP per capita

Period	GDP per capita		Period	GDP per capita		Period	GDP per capita
Dec-02	13958		Jun-07	18276		Dec-11	28,443
Mar-03	12183		Sep-07	18,107		Mar-12	25,178
Jun-03	12578		Dec-07	21251		Jun-12	27,195
Sep-03	12792		Mar-08	19,087		Sep-12	26,425
Dec-03	14821		Jun-08	21,234		Dec-12	30,598
Mar-04	13374		Sep-08	21,230		Mar-13	27,024
Jun-04	14044		Dec-08	23,768		Jun-13	29,103
Sep-04	14307		Mar-09	19,999		Sep-13	28,428
Dec-04	16549		Jun-09	21,678		Dec-13	32,952
Mar-05	14587		Sep-09	21,408		Mar-14	29,013
Jun-05	15479		Dec-09	25,059		Jun-14	31,523
Sep-05	15613		Mar-10	22,285		Sep-14	30,438
Dec-05	18146		Jun-10	24,304		Dec-14	35,567
Mar-06	16056		Sep-10	23,464		Mar-15	30,040
Jun-06	16768		Dec-10	27,142		Jun-15	32,677
Sep-06	16940		Mar-11	23,786		Sep-15	31,259
Dec-06	19554		Jun-11	25,633		Dec-15	36,794
Mar-07	17287		Sep-11	24,498			

Annex 10. Vector autoregression estimates

Vector Autoregression Estimates
Date: 05/06/16 Time: 15:23
Sample (adjusted): 3/01/2003 12/01/2015
Included observations: 52 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	RPHY	RMSMSE	RLIQ	RLGDP	RNPLD
RPHY(-1)	0.536498	-0.048594	0.650203	-0.004214	0.072488
	(0.12908)	(0.15173)	(0.43093)	(0.00966)	(0.10200)
	[4.15642]	[-0.32027]	[1.50882]	[-0.43642]	[0.71064]
RMSMSE(-1)	-0.035016	0.388144	-0.136896	-0.015256	0.089605
	(0.11199)	(0.13164)	(0.37389)	(0.00838)	(0.08850)
	[-0.31266]	[2.94847]	[-0.36614]	[-1.82101]	[1.01248]
RLIQ(-1)	0.003631	-0.014634	0.483538	0.001758	-0.055177
	(0.03548)	(0.04171)	(0.11846)	(0.00265)	(0.02804)
	[0.10234]	[-0.35085]	[4.08170]	[0.66220]	[-1.96774]
RLGDP(-1)	2.364714	-6.156763	11.33390	-0.593733	-1.084683
	(1.47653)	(1.73562)	(4.92950)	(0.11045)	(1.16683)
	[1.60154]	[-3.54729]	[2.29920]	[-5.37538]	[-0.92960]
RNPLD(-1)	0.109940	0.029300	0.744192	-0.000760	0.748068
	(0.11129)	(0.13082)	(0.37154)	(0.00833)	(0.08794)
	[0.98790]	[0.22398]	[2.00299]	[-0.09127]	[8.50609]
C	-0.012992	-0.034743	-0.023509	-0.002495	0.028257
	(0.06962)	(0.08184)	(0.23244)	(0.00521)	(0.05502)
	[-0.18661]	[-0.42453]	[-0.10114]	[-0.47899]	[0.51358]
R-squared	0.319667	0.260981	0.424241	0.514211	0.629318
Adj. R-squared	0.245718	0.180653	0.361658	0.461407	0.589027
Sum sq. resids	11.56410	15.97860	128.8945	0.064713	7.221765
S.E. equation	0.501392	0.589373	1.673934	0.037507	0.396226
F-statistic	4.322793	3.248936	6.778901	9.738245	15.61914
Log likelihood	-34.69801	-43.10498	-97.38633	100.1302	-22.45705
Akaike AIC	1.565308	1.888653	3.976397	-3.620392	1.094502
Schwarz SC	1.790451	2.113797	4.201541	-3.395249	1.319646
Mean dependent	-0.002707	-0.037732	0.002412	-0.001557	0.026731
S.D. dependent	0.577311	0.651113	2.095134	0.051108	0.618068

Determinant resid covariance (dof adj.)	4.42E-05
Determinant resid covariance	2.40E-05
Log likelihood	-92.30066
Akaike information criterion	4.703872
Schwarz criterion	5.829589

Annex 11. Response to Cholesky one S.D. innovations ± 2 S.E. (all variables)