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INTRODUCING A MULTI-DIMENSIONAL FINANCIAL DEVELOPMENT INDEX FOR THE PHILIPPINES

By
Jean Christine A. Armas and
Nerissa D. De Guzman¹

¹ The authors are Bank Officers at the Department of Economic Research of the Bangko Sentral ng Pilipinas (BSP). They are thankful to Director Dennis D. Lapid and Managing Director Zeno Ronald R. Abenoja for their insightful comments and suggestions for improving the research paper. The full version of this newsletter can be accessed at the BSP Working Paper Series (https://www.bsp.gov.ph/Media_And_Research/WPS/WPS202205.pdf).

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Introduction

The financial system is a set of institutions, instruments, and markets within a legal and regulatory framework that permits credit transactions.

Fundamentally, financial sector development is about overcoming “costs” incurred in the financial system. According to the finance-growth theory, economic growth can be achieved with financial development through capital accumulation and technological progress. This can be done by increasing the savings rate, mobilizing and pooling savings, producing information on investments, facilitating and encouraging foreign capital inflows, and optimizing capital allocation (Levine, 1999).

Numerous empirical studies show a causal relationship between countries’ long-term growth and their well-developed financial systems (Demirguc-Kunt & Levine, 2008). This means that financial development not only results from economic growth but also contributes to it.

Existing literature often use private sector credit-to-gross domestic product (GDP), a usual measure of financial depth, as the main indicator to measure financial development. However, while this measure focuses on the quantity aspect of financial institutions it does not capture the true extent of development in the financial system.

The financial system is complex and multi-dimensional as highlighted by the 2007–2009 Global Financial Crisis (GFC) aftermath. The Philippine financial system, while largely dominated by banks, is also composed of non-banking financial institutions (non-banks) and financial markets (FMs). Given the diversity of the country’s financial system, measuring financial development using multiple

indicators that account for financial activities other than credit or lending is necessary.

The motivations for this study are the following: (1) to improve the existing single proxy variable for financial development; (2) to capitalize on the available data sources by consolidating several indicators; and (3) to conduct an extensive and comprehensive analysis of the degree of Philippine financial development.

This study aims to construct a multi-dimensional index of financial development for both financial institutions (FIs) and FMs in terms of access, depth, efficiency, and stability. By including the stability dimension, this index is an improvement and an extension of the 2016 International Monetary Fund (IMF) index.

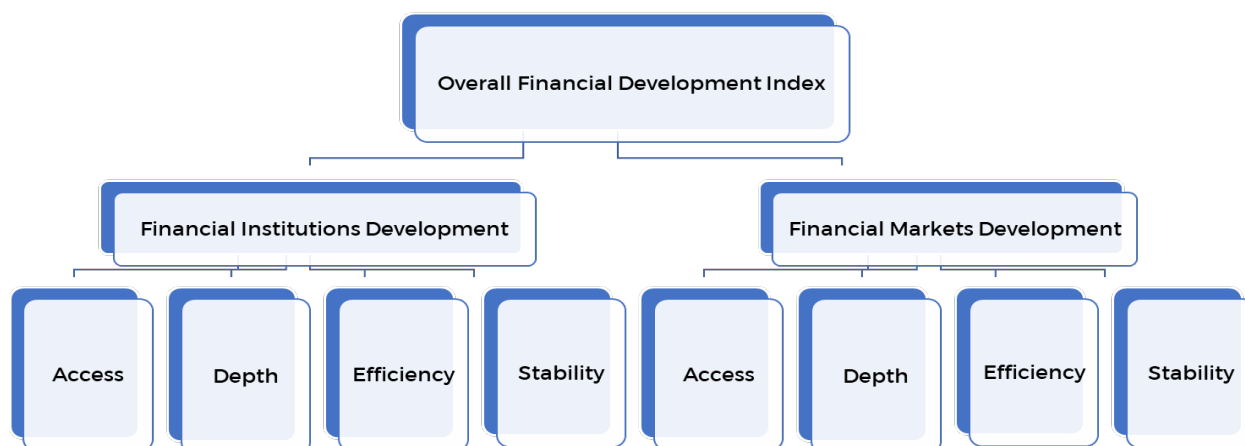
Lastly, this study addresses the following key questions: (1) How can the multi-dimensional aspects of the Philippine financial system be empirically characterized?; and (2) What are the trends in the Philippine financial system after the GFC?

Analytical Framework

The construction of a quarterly multi-dimensional financial development index for the Philippines is built upon the 4x2 matrix of financial system characteristics (*Figure 1*).² Developing an overall index—and sub-indices that pull together various indicators—is important to allow a holistic assessment of the overall level of financial development in the country.

² Čihák et al., 2012.

Figure 1. Analytical Framework of a Multi-Dimensional Financial Development Index



Construction of the Multi-Dimensional Financial Development Index (FDI)

The construction of the multi-dimensional FDI follows the four-step method of the Organisation for Economic Co-operation and Development in constructing composite indicators (OECD, 2008).

Step 1: Winsorization and normalization of all the variables

Winsorization is the process of replacing extreme values by setting all the outliers to certain percentiles. Winsorized indicators are then normalized, between 0 and 1, to make the variables comparable and to facilitate their aggregation despite having different measurement units. All the indicators were normalized using the min-max equations below³:

$$V_x = \frac{x - x_{min}}{x_{max} - x_{min}} \quad eq. (1)$$

$$V_{x,rescaled} = 1 - \frac{x - x_{min}}{x_{max} - x_{min}} \quad eq. (2)$$

³ The Human Development Index is an example of an index that made use of the min-max normalization technique.

Step 2: Derivation of weights from Principal Component Analysis (PCA)

To generate a good composite index, the PCA was used to capture as much information available as possible, without running into the issue of collinearity.

Step 3: Aggregation of normalized variables into sub-indices

A total of eight sub-indices were constructed to assess how developed FIs and FMs were in terms of access, depth, efficiency, and stability using the equations below:

$$FI_j = \sum_{i=1}^n w_i V_i \quad eq. (3)$$

$$FM_j = \sum_{i=1}^n w_i V_i \quad eq. (4)$$

where *FI* and *FM* stand for financial institutions and financial markets, respectively.

The PCA-based weight of variable *i* is denoted as *w_i*, while the subscript *j* pertains

to the four aspects of financial development.

Step 4: Aggregation of sub-indices into an overall index

The eight sub-indices were then aggregated into second-level indices to construct the FI (Equation 5) and FM (Equation 6) development indices. In particular, 20 and 18 indicators fed into the construction of FI and FM development indices, respectively.

$$FI = \sum_{j=1}^4 w_j FI_j \quad \text{eq. (5)}$$

$$FM = \sum_{i=1}^4 w_i FM_i \quad \text{eq. (6)}$$

Using the PCA-based weights for each dimension, the highest aggregation level generated was the financial development (FD) index (Equation 7).

$$FD = w_{FI} FI + w_{FM} FM \quad \text{eq. (7)}$$

The aggregation method used is a weighted linear average of the underlying indicators in which the weights derived from the PCA reflect the contribution of each data series and dimension j to the variation in specific sub-index and overall index, respectively.

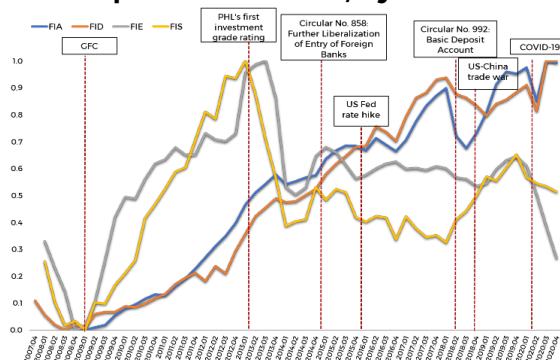
Analysis of the Results

On Financial Institutions Development

Overall, the evolution of the FIs development sub-index, by dimension, shows a generally upward pattern with some noticeable peaks and troughs corresponding to significant domestic and international economic events.

The lowest levels of FI development were recorded during and immediately after the GFC. The crisis caused financial instability and inefficiency, making access to financial services difficult. Similarly, the sub-indices dipped during the COVID-19 pandemic, though the decrease was not as steep as in the GFC period. We attribute this to the distinct nature of the shocks. The GFC originated from the financial sector, whereas the pandemic—as a public health crisis—arose from the real sector. Moreover, the Bangko Sentral ng Pilipinas' (BSP) swift policy response to ensure that there is ample liquidity in system amid the pandemic has averted the crisis from further spilling over to the financial sector.

Figure 2. Financial Institutions Development Overtime, by Dimension



Investment Rating Upgrade (2013)

The first-ever investment rating upgrade of the Philippines to “BBB-” from “BB+” in Q1 2013 contributed to the peak in the FI stability sub-index.

Adoption of Policies on Financial Access and Inclusion (2014, 2018)

After the GFC, there has been a surge in the level of all sub-indices, with efficiency and stability sub-components showing marked increases. This implies that the measures adopted to safeguard the financial system worked. The prudent regulatory standards and the risk management measures taken by the BSP have fortified banks' resiliency

against liquidity and financial stress. Philippine banks were also able to compete with larger banks in the region due to the further liberalization of foreign bank entry under BSP Circular No. 858 in 2014, as well as the ongoing streamlining and consolidation of the banking system. Meanwhile, the issuance of BSP Circular No. 992, or the Basic Deposit Accounts framework, broadened banks' reach and provision of financial services. This, in turn, is reflected in the greater level of FI depth and access sub-indices.

External Developments (2015, 2018)

The impact of the United States Federal Reserve (US Fed) policy interest rate hike in 2015 and the trade tensions between China and the US in 2018 resulted in noticeable drops in the sub-indices.

COVID-19 Pandemic in 2020

The pandemic brought the economy to a standstill that resulted in the downward trend for the FI efficiency and stability sub-indices. The largest contributors to the decline in the efficiency sub-index was lower bank profitability as evidenced in their operating ratios, return on assets, and capital ratios. Provisions for credit or loan losses increased substantially by 303.5 percent in the second semester of 2020.⁴ While banks' non-performing loan ratios rose during the pandemic, the Philippine banking system remained well-capitalized, with capital adequacy ratio exceeding the Bank for International Settlements' BASEL III prescribed threshold of 8.0 percent and the BSP's capital ratio requirement of 10 percent.⁵

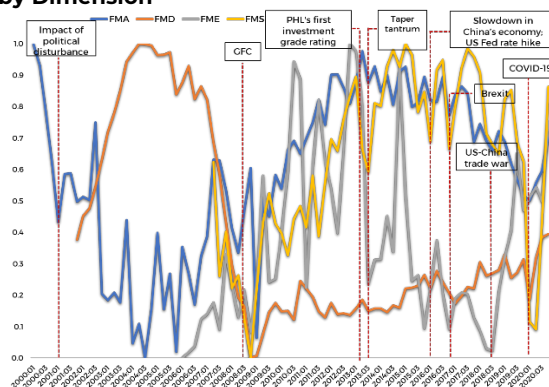
⁴ Status Report of the Philippine Financial System (2nd Semester of 2020)

⁵ Basel III is a comprehensive set of reform measures developed by the Basel Committee on Banking

On Financial Markets Development

FMs development is usually assessed by measuring the stock market capitalization-to-GDP ratio, which is another common measure of financial depth. However, in the Philippines, equating FM development solely to financial depth might lead to an imprecise depiction of degree and extent—especially since tapping domestic capital markets as an alternative source of funding has been gaining traction in non-financial corporations since 2007. As seen in Figure 3, the FM sub-components show a rather fluctuating trend, reflecting the inherent volatility of financial markets.

Figure 3. Financial Markets Development Overtime, by Dimension



Political Disturbance (2000)

The impeachment trial of former President Joseph E. Estrada, which led to minor bank runs and dampened investor confidence, affected FMs' performance. Its peak effect occurred during the first half of 2001, as depicted in the dip of the FM access sub-index in Q1 2001.

Supervision to strengthen the regulation, supervision, and risk management of the banking sector.

GFC (2007–2009)

Similar to FIs, markets suffered the lowest levels of development across all dimensions during the GFC, bearing the brunt of the crisis' impact from Q4 2008 to Q1 2009. The financial depth indicator remained moderate, moving within the range of 0.1–0.4 post-GFC, reflecting the decline in long-term foreign holdings of debt securities. This may be attributed to the shift to shorter tenors immediately after the GFC in a bid to increase liquidity in the system. Concurrently, the National Government's shift to domestic borrowings to minimize foreign exchange rate risks and promote capital market development had an impact on FMs.

Investment Rating Upgrade and US Taper Tantrum (2013)

The Philippine stock market performed very well at the start of Q1 2013, which coincided with the country's first investment grade score, until talks of US Fed's reduction of its quantitative easing activities by Q2 2013 emerged. The impact of the taper tantrum was reflected in evident drops in all FM sub-indices until Q3 2013.

External Developments (2015, 2016, 2017, 2018)

The slowdown in the Chinese economy, in tandem with the US Fed's rate increases in Q3 2015 and the United Kingdom's exit from the European Union (Brexit) in Q3 2016, contributed to the decline in the levels of FM sub-indices. Moreover, the downturn in emerging markets (Brazil, China, and Russia), along with Greece's bailout referendum, resulted in a dip in the FM depth sub-index in 2016. By 2017, the FM depth sub-index posted a reversal on the back of higher net investments in foreign equity securities by local corporates and debt securities by local banks amid the recovering global economic growth and a solid domestic economy. Meanwhile, the

trade tensions between China and the US in 2018—alongside domestic price pressures that led the BSP to raise the policy interest rate by 175 basis points—contributed to the bearish stance of FMs, with companies postponing their expansion activities.

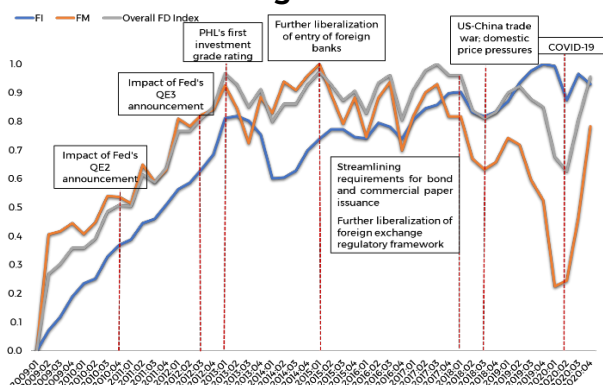
COVID-19 Pandemic in 2020

The height of the global health crisis in 2020 also manifested a steep decline in FM sub-indices. Developments related to the pandemic continued to dampen investor sentiment, while business operations adjusted to stringency measures implemented by the National Government in a bid to stop the spread of the virus. This can be observed from the drop in the market capitalization of listed firms, which contributed to the decline in the access, depth, and stability sub-indices. Investors reacted quite swiftly to these events as the effects were observed either contemporaneously or subsequently. Nonetheless, markets bounced back relatively quickly as evidenced by the movements of FM access, depth, and stability sub-indices in Q3 2020.

Overall Financial Development Landscape of the Philippines

The country's overall FD landscape is influenced by the extent and level of development in both FIs and FMs. In general, the Philippine financial system has progressed as seen in the upward-sloping trend of the index. Notable developments can be attributed to external economic events as well as to the developments in the regulatory environment for both FMs and FIs.

Figure 4. Overall Financial Development Through Time



Quantitative Easing by the US Fed (2010, 2012)

The US Fed's announcement of its second and third rounds of quantitative easing resulted in an increase in the FM index in Q4 2010 and Q3 2012 as Philippine domestic FMs benefitted from periods of low interest rates in the US, which led to substantial capital inflows.

US-China Trade Tensions (2018)

Investors were alarmed by the trade tensions between China and the US as well as domestic inflation concerns stemming from supply-side issues, such as the rising global oil prices and the higher excise taxes (i.e., imposed under Republic Act No. 10963 or the Tax Reform for Acceleration and Inclusion Law). Companies that were considering holding their initial public offering in 2018 postponed their plans amid concerns of not generating enough interest from investors.

COVID-19 Pandemic in 2020

Conversely, the pandemic caused stock markets worldwide to drop following the World Health Organization's declaration on 30 January 2020 that the coronavirus was a global public health emergency.

Adoption of Policies on Financial Access and Inclusion (2014, 2018)

The issuance of BSP Circular No. 858 on the further liberalization of foreign bank entry built a more competitive banking industry and drew more foreign direct investments. Moreover, the BSP's easing of its foreign exchange rules to facilitate flows of foreign portfolio investments fueled development not only in FIs but also in capital markets. Fundamentally, these events contributed to higher levels of financial development in the Philippine financial system.

Summary

Financial development is a complex and multi-dimensional concept that requires a broad range of data to measure and analyze. In this study, we created a financial development index for the Philippines that captures the (1) degree to which individuals can and do use financial services (access); (2) size of financial intermediaries and markets (depth); (3) efficiency of financial institutions and markets in intermediating resources and facilitating transactions (efficiency); and (4) the stability of the financial system (stability) for both FIs (e.g., banks and insurance firms) and FMs (e.g., bond and stock markets).

This study provides evidence that focusing only on one feature of the financial system would mean neglecting other important aspects of financial development. The results further highlighted that financial access, depth, efficiency, and stability are four distinct dimensions. It is, therefore, important to examine and understand financial development through the lens of these four dimensions to pin down the sources of fragilities in the Philippine financial system and to identify which aspects are likely to influence a country's macroeconomic performance. Further, this study showed that, overall, the Philippine financial system has developed and progressed following the aftermath of the GFC—with both financial institutions and

markets development having a generally upward trend.

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