An Index of Financial Inclusion in the Philippines: Construction and Analysis

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Financial inclusion has become a policy priority in many developing countries, including the Philippines. However, the issue of its robust measurement is still outstanding. The challenge comes from the fact that financial inclusion is a multidimensional phenomenon. A comprehensive measure is therefore needed to adequately gauge the inclusiveness of a financial system. This paper constructed a Financial Inclusion Index (FII) to measure access to and usage of financial services in the Philippines using provincial data. Results show that while there are marked geographical disparities based on the FII, there is significant positive spatial autocorrelation indicating that nearby provinces exhibit similar levels of financial inclusion. The paper also showed the relationship between the FII and some variables that are often linked to financial inclusion such as income, poverty, literacy, and employment as well the province's level of human development and competitiveness. On the methodological side, possible improvements and technical innovations in constructing the FII are laid out to maximize its potential as an analytical tool for surveillance and policy-making.

Key words: inclusive finance, composite indicator, financial inclusion index

1. Introduction

In the Philippines, only 31% of adults have an account at a formal financial institution. Globally, it is estimated that 2 billion people do not have a formal account (World Bank, 2014).[3] The extent of financial exclusion is so striking that building inclusive financial systems has become an important development agenda at both national and global level. The heightened interest also stems from a better

understanding of the potential benefits of financial inclusion. Many studies have shown that the poor benefit enormously from access to basic financial services such as savings, credit and insurance. For firms, particularly the micro, small and medium enterprises (MSMEs), access to finance is associated with innovation, productivity, and job creation. A growing body of literature also suggest that financial inclusion can help alleviate poverty, reduce income inequality, and promote inclusive growth (Consultative Group to Assist the Poor, 2012; 2014).

While there has been a consensus on the importance of financial inclusion, efforts to measure it remain incomplete (Camara and Tuesta, 2014), the issue of its robust measurement is still outstanding (Amidžić et al., 2014), and there is no standard method by which it can be measured (Park and Mercado, 2015). The challenge comes from the fact that financial inclusion is a multidimensional phenomenon. While supply-side indicators such as the number of banks per 10,000 adults as well as demand-side indicators such as the percentage of adults with a formal account provide useful description of how inclusive a financial system is, these indicators only provide partial information when used individually. A comprehensive measure is important to adequately gauge the inclusiveness of a financial system.

The objective for constructing a Financial Inclusion Index (FII) is to come up with a composite indicator that incorporates information on the different dimensions of financial inclusion. The potential benefits of developing an index of financial inclusion are promising. For instance, it can serve as an analytical tool which can be used for surveillance and policy purposes on a regular basis. As an example, the Bangko Sentral ng Pilipinas (BSP, Central Bank of the Philippines), being the country's regulator of banks and other financial institutions, can use the FII in monitoring progress and assessing financial inclusion levels of different parts of the country which can guide the formulation of informed policies and targeted interventions.

This paper is organized as follows: Section 2 provides a brief background on financial inclusion in the Philippines. Section 3 reviews existing literature in index construction, with focus on indexing strategies for financial inclusion. Section 4 describes the data sources and empirical methodology. Section 5 presents the results, and finally Section 6 provides some concluding notes.

## 2.   Financial Inclusion in the Philippines

In the country's National Strategy for Financial Inclusion (NSFI),[4] financial inclusion is defined as the state wherein there is effective access to a wide range of financial products and services for all Filipinos.

Promoting greater financial inclusion in the Philippines remains a pressing challenge. As of end-year 2015, 591 out of 1,634 cities and municipalities remain unbanked. There are marked regional disparities as bank branches are concentrated

in highly urbanized and populous areas of the National Capital Region (NCR) and Regions III and IV-A, while other regions such as Eastern Visayas and Autonomous Region in Muslim Mindanao (ARMM) are significantly left underserved. NCR alone already accounts for 42% and 68% of the total number of deposit accounts and amount of deposits in banks, respectively. Fortunately, other non-bank financial service providers (FSPs) such as cooperatives, microfinance institutions, financing/lending companies, pawnshops, remittance agents, money changers, and electronic money agents are present in most unbanked areas. It is estimated that only 12% of municipalities remain unserved if other FSPs are taken into account (BSP, 2015).

Usage of formal financial services is another challenge. Based on the National Baseline Survey on Financial Inclusion (NBSFI), 43% of Filipino adults have savings but 68% of them keep their savings at home and only 33% are saving in banks. Forty-seven percent (47%) of adults have outstanding loans but 72% borrow from informal sources such as family, friends, relatives, and other informal lenders.

In comparison with other countries, formal account penetration in the Philippines is comparable with Vietnam, higher than Laos, Myanmar, and Cambodia, but lagging behind Singapore, Malaysia, Thailand, and Indonesia.
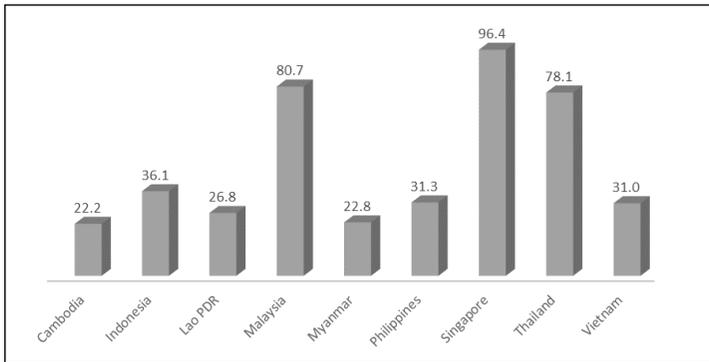
Source: World Bank Global Financial Inclusion Database (2014)

Figure 1. Percentage of adults with a formal account: Southeast Asia

Recent studies on financial inclusion highlight the importance of data in measuring impact, identifying existing gaps and opportunities, and crafting evidence-based policies. At present, however, analysis of financial inclusion in the Philippines has been focused on unidimensional indicators. A multidimensional index providing a comprehensive measure financial inclusion is therefore needed.

3. Existing Indexing Strategies

A composite index (or simply an index) is constructed with an objective to obtain a synoptic or comprehensive single number, representing a wide array of measurements on the multiple aspects of a conceptual entity (Mishra, 2007). Simply put, an index measures multidimensional concepts which cannot be captured by a single indicator.

The general objective of most indices is to allow comparisons across time or space. For instance, when various indicators are used to evaluate two different provinces, some of these variables may be in favor of province *A* while other variables may be in favor of province *B*. An index is needed to compare these two provinces in terms of their overall performance.

On the methodological side, indexing strategies can be grouped into two main types: parametric and nonparametric.

Parametric approach

Parametric methods of index construction are based on multivariate techniques such as Principal Components Analysis (PCA) and Factor Analysis (FA). It is assumed that there is a latent structure behind the variation of a set of correlated indicators so that the importance of these indicators in the overall index can be determined endogenously. The usual procedure involves calculating the PC/factor loadings, multiplying the standardized indicator values by the loadings, and summing up to produce the index.

It should be noted that when the dataset contains outlying observations, an index that is based purely on a parametric approach is not robust since outliers adversely affect the computation of the PCs/factors. These outliers cannot be removed from the analysis, otherwise there will be no computed index for them. In addition, different extraction methods supply different values for the PCs/factors and thus influence the resulting indices and rankings. These are the major disadvantages of a parametric approach where the index is constructed endogenously. According to Mishra (2008), the more robust composite indices are ones that are exogenously determined.

Nonparametric approach

Exogenous construction of an index can be done through a nonparametric approach. Nonparametric methods involve standardization of variables based on some normalization rules and subsequently combining the indicators using an aggregation formula and weighting scheme.

The general formulation for a nonparametric index involves the following procedures: A dimension index d_i is created for each dimension. Since the indicators have different units and cannot be aggregated directly, they are standardized first. A common standardization technique is the Min-Max rule. Min-Max normalizes

the indicators to have an identical range [0, 1] by subtracting the minimum value and dividing by the range:

$$d_i = \frac{x - m}{M - m}$$ (1)

where
  x = actual value of the indicator
  m = minimum
  M = maximum

Another related standardization method is Distance to Reference (hereby denoted as DTR). This approach measures the relative position of an indicator with respect to a reference point. The reference could be a target to be reached or the maximum value (i.e., group leader). With R as the reference point, DTR is expressed as

$$d_i = \frac{x}{R}$$ (2)

The dimension indices are combined into a composite measure by using an aggregation formula which is usually either linear or geometric. Let ω_i be the weight assigned to d_i and I be the final index. The formulas for linear and geometric aggregation are:

$$I_{Linear} = \frac{1}{n}\left(\sum_{i=1}^{n} \omega_i d_i\right) \text{ with } \sum_{i=1}^{n} \omega_i = 1 \text{ and } 0 \le \omega_i \le 1$$ (3)

$$I_{Geometric} = \left(\prod_{i=1}^{n} d_i^{\omega_i}\right)^{1/\sum_{i=1}^{n}\omega_i}$$ (4)

If a dimension contains several indicators, say $x_1, x_2, \ldots, x_p$, standardization is applied to each indicator and the standardized indicators will be aggregated to form the dimension index. In both linear and geometric aggregations, a deficit in one dimension can be offset or compensated by a surplus in another. This property is called substitutability, wherein an increase in one dimension can be compensated for by a decrease of equal (in case of arithmetic average) or proportional (in case of geometric average) magnitude in another dimension (Sarma, 2012).

Financial Inclusion Index (FII)
Several indexing strategies can be found in literature to measure financial inclusion across different countries using a multidimensional index. The country-level FII developed by Camara and Tuesta (2014) is PCA-based, while that of

Sarma (2008, 2012), Chakravarty and Pal (2010), and Amidžić et al. (2014) are nonparametric.

Chakravarty and Pal (2010) used the Min-Max rule, and followed an axiomatic approach in index construction. Amidžić et al. (2014) utilized DTR in standardization and weighted geometric mean in aggregation wherein weights were derived using factor analysis.[5]

Sarma (2012) adopted the methodology in the construction of the Human Development Index (HDI) to produce an index that will compare financial inclusion levels of different countries. The nonparametric FII is constructed as follows: A dimension index is computed based on the Min-Max rule where the weight is already incorporated:

$$d_i = \omega_i \frac{x - m}{M - m} \text{ with } 0 \leq \omega_i \leq 1 \tag{5}$$

In Sarma's index, weights are arbitrary. Based on the formulation in (5), $0 \leq d_i \leq \omega_i$. The higher the value of d_i, the higher the achievement in dimension i. If n dimensions of financial inclusion are considered, then the achievements in these dimensions will be represented by a point $D = (d_1, d_2,\ldots,d_n)$ on the n-dimensional space. Let $O = (0, 0,\ldots,0)$ represent the point indicating the worst situation while $W = (\omega_1, \omega_2, \ldots ,\omega_n)$ represent an ideal situation indicating the highest achievement in all dimensions. Sarma's formula for computing the FII is based on the notion of distance from a worst point and from an ideal point:

$$FII = \frac{1}{2}\left[\frac{\sqrt{d_1^2 + d_2^2 + \ldots + d_n^2}}{\sqrt{\omega_1^2 + \omega_2^2 + \ldots + \omega_n^2}} + \left(1 - \frac{\sqrt{(\omega_1 - d_1)^2 + (\omega_2 - d_2)^2 + \ldots + (\omega_n - d_n)^2}}{\sqrt{\omega_1^2 + \omega_2^2 + \ldots + \omega_n^2}}\right)\right] \tag{6}$$

Larger distance between D and O would indicate higher financial inclusion while smaller distance between D and W would indicate higher financial inclusion. The FII uses the average of the Euclidian distance between D and O, and the inverse Euclidian distance between D and W. Both these distances are normalized by the distance between O and W, to make them lie between 0 and 1.

4. Methodology
Data
Existing cross-country FIIs are constructed mostly using supply-side data or those coming from financial service providers. We included demand-side indicators to capture information coming from users of financial services. With provinces as units of analysis, the data used in index construction were sourced from the following:

Table 1. Data Used in the Construction of FII

Data	Source
Number of banks and other financial service access points	Bangko Sentral ng Pilipinas (BSP)
Percentage of households with deposit, credit, and insurance	Family Income and Expenditure Survey (FIES)
Adult population projection	Philippine Statistics Authority (PSA)
Habitable land area	National Mapping and Resource Information Authority (NAMRIA)

Index construction

Given the disadvantages of an index that is based purely on a parametric approach, the proposed FII was constructed using a nonparametric methodology. Following the result of an initial study which explored different scenarios in FII construction, and assessed the performance of the proposed FII against a set of tests for index numbers, this paper followed a distance-based approach wherein indicators were normalized using modified DTR. For simplicity, equal weighting scheme was used.[6]

The constructed FII covers two key dimensions of financial inclusion – access and usage.[7] Access refers to the availability of financial services and was measured using indicators that take into account the presence of banks and other FSPs in relation to population and land area. Usage refers to the adoption and uptake of financial services and was measured using the percentage of households with deposit, credit, and insurance. Access indicators used supply-side data of the BSP as of 2014, while usage indicators were sourced from the 2012 FIES.[8]

Table 2. Dimensions and Indicators in the FII

Dimension	Indicator	Notation
Access d_1	Number of banks per 10,000 adults	x_{11}
	Number of other FSPs per 10,000 adults	x_{12}
	Number of banks per 100 km^2	x_{13}
	Number of other FSPs per 100 km^2	x_{14}
Usage d_2	Percentage with deposits and/or investments	x_{21}
	Percentage with outstanding loans	x_{22}
	Percentage with insurance	x_{23}

Since the indicators have different units and thus cannot be aggregated directly, they were first normalized. A modified version of DTR was employed to address the presence of outliers. In modified DTR, we set $R = M^*$ where M^* is the highest value less than $Q_3 + 1.5(Q_3 - Q_1)$.[9] If the actual value is higher than M^*, we set it to M^*. Let x_{ij} be the value of indicator j under dimension i and

x_{ij}^{*} be its normalized value multiplied by w_{ij} which is the corresponding weight, $\sum_{j=1}^{p} w_{ij} = 1$ and $0 \le w_{ij} \le 1$.

$$x_{ij}^{*} = \begin{cases} w_{ij} \dfrac{x_{ij}}{R}, & \text{if } x_{ij} < R \\ w_{ij}, & \text{if } x_{ij} \ge R \end{cases} \tag{7}$$

Using distance-based aggregation which is based on the notion of distance from the worst point and the ideal point, the dimension indices are given by

$$d_1 = \frac{1}{2}\left[\frac{\sqrt{x_{11}^{*2}+x_{12}^{*2}+x_{13}^{*2}+x_{14}^{*2}}}{\sqrt{w_{11}^{2}+w_{12}^{2}+w_{13}^{2}+w_{14}^{*2}}} + \left(1 - \frac{\sqrt{(w_{11}-x_{11}^{*})^2+(w_{12}-x_{12}^{*})^2+(w_{13}-x_{13}^{*})^2+(w_{14}-x_{14}^{*})^2}}{\sqrt{w_{11}^{2}+w_{12}^{2}+w_{13}^{2}+w_{14}^{*2}}}\right)\right] \tag{8}$$

$$d_2 = \frac{1}{2}\left[\frac{\sqrt{x_{21}^{*2}+x_{22}^{*2}+x_{23}^{*2}}}{\sqrt{w_{21}^{2}+w_{22}^{2}+w_{23}^{2}}} + \left(1 - \frac{\sqrt{(w_{21}-x_{21}^{*})^2+(w_{22}-x_{22}^{*})^2+(w_{23}-x_{23}^{*})^2}}{\sqrt{w_{21}^{2}+w_{22}^{2}+w_{23}^{2}}}\right)\right] \tag{9}$$

Let $d_i^{*} = \omega_i d_i$ where the weight ω_i is such that $\sum_{i=1}^{n} \omega_1 = 1$ and $0 \le \omega_i \le 1$. By using another round of distance-based aggregation, the FII is given by

$$FII = \frac{1}{2}\left[\frac{\sqrt{d_1^{*2}+d_2^{*2}}}{\sqrt{\omega_1^{2}+\omega_2^{2}}} + \left(1 - \frac{\sqrt{(\omega_1-d_1^{*})^2+(\omega_2-d_2^{*})^2}}{\sqrt{\omega_1^{2}-\omega_2^{2}}}\right)\right] \tag{10}$$

5. Results and Discussion

Table 3 shows the key indicators of financial inclusion at the national level, in NCR, and in some provinces. In the Philippines, there are approximately 2 banks and 5 other FSPs per 10,000 adults. On a per 100 km² basis, there are 7 banks and 10 other FSPs. However, the national indicator is being pulled up by NCR which is an outlier especially in terms of the number of banks and other FSPs per 100 km².

With regard to usage, only 2 out of 10 households have a deposit or investment account, and the same estimate applies for households with outstanding loan.[10] Four (4) out of 10 households are covered by insurance. While it appears that more Filipinos have insurance than deposit and credit, it should be noted that the FIES question on insurance include government health insurance and pension system (i.e., PhilHealth, GSIS, SSS) and not just private insurance plan.

Table 3. Indicators of Financial Inclusion for Selected Areas

	No. of banks per 10,000 adults	No. of other FSPs per 10,000 adults	No. of banks per 100 km^2	No. of other FSPs per 100 km^2	% with deposit/ invest- ment	% with credit	% with insurance
Philippines	1.50	4.86	7.27	9.89	0.23	0.23	0.41
NCR	3.76	12.38	679.01	1,738.39	0.44	0.14	0.61
Select Provinces							
Laguna	2.32	6.80	32.14	66.12	0.49	0.27	0.66
Davao del Sur	1.60	6.23	11.55	15.83	0.04	0.24	0.54
Pangasinan	1.11	3.70	5.94	147.50	0.18	0.19	0.28
Occidental Mindoro	1.29	1.84	2.82	1.07	0.47	0.46	0.47
Batanes	1.96	3.91	4.04	2.74	0.18	0.18	0.27
Sulu	0.11	0.99	1.26	1.54	0.00	0.03	0.00

Note: Dark gray – included in the top 10 provinces
      Light gray – included in the bottom 10 provinces

From Table 3, it can be observed that Laguna is always included in the top 10 across all indicators, except on the percentage of households with credit. Sulu is always at the bottom 10 in most indicators. For provinces like Laguna and Sulu, it may be easy to describe the level of financial inclusion as high and low, respectively.

However, this "dashboard approach" in looking at financial inclusion at the subnational level is not always straightforward. For instance, Davao del Sur is a consistent topnotcher in access indicators, but it belongs to the bottom 10 in terms of percentage of households with deposit account. Pangasinan is the province with the most number of other FSPs per 100 km^2, but it is never part of the top 10 in all other indicators. Occidental Mindoro's access indicators are not among the highest, but it has a relatively high percentage of households with deposit and credit. Batanes stood out in terms of number of banks vis-à-vis adult population, but not in other indicators.

As evident from these examples, any one single indicator fails to adequately capture the extent of financial inclusion. Thus there is a need for a single measure that will summarize the information being provided by different indicators. This will facilitate comparison of financial inclusion at the subnational level.

The resulting FIIs are presented in Table 4. The provinces were grouped into three categories. The grouping was based on quartiles where $Q_1 = 0.40$, $Q_2 = 0.50$ and $Q_3 = 0.60$ so that FIIs below 0.40 are considered "low", FIIs greater than 0.60 are considered "high" and FIIs in between are considered "average." Many provinces (42.5%) belong to the average category, while provinces with high FII make up the smallest group (25%). One third of the provinces fall under the group

with low FII. Initiatives to build a more inclusive domestic financial system may consider these provinces with low FII as focus geographical areas.

Table 4. Resulting FII of Provinces

High		Average		Low	
Laguna	0.961	Occidental Mindoro	0.605	Aurora	0.400
Cavite	0.852	Marinduque	0.583	Negros Oriental	0.384
Batangas	0.835	Iloilo	0.571	Ifugao	0.379
Benguet	0.832	Nueva Ecija	0.565	Catanduanes	0.377
Rizal	0.816	Quezon	0.561	Sarangani	0.370
Cebu	0.765	Tarlac	0.541	Sorsogon	0.367
Davao del Sur	0.740	Surigao del Sur	0.538	Ilocos Norte	0.359
Pampanga	0.735	Camarines Sur	0.533	Cagayan	0.357
Misamis Oriental	0.716	Negros Occidental	0.523	Palawan	0.353
South Cotabato	0.705	Capiz	0.516	Kalinga	0.352
La Union	0.700	Camiguin	0.508	Davao Oriental	0.352
Aklan	0.690	Masbate	0.501	Guimaras	0.347
Bulacan	0.681	Misamis Occidental	0.492	Western Samar	0.343
Davao del Norte	0.669	Albay	0.490	Dinagat Islands	0.336
Bataan	0.652	Batanes	0.484	Lanao del Norte	0.310
Zambales	0.649	Surigao del Norte	0.480	Romblon	0.298
Agusan del Norte	0.646	Ilocos Sur	0.475	Sultan Kudarat	0.283
Camarines Norte	0.640	Leyte	0.467	Quirino	0.263
Oriental Mindoro	0.625	Bohol	0.454	Eastern Samar	0.251
Pangasinan	0.608	Nueva Vizcaya	0.452	Northern Samar	0.246
		Southern Leyte	0.449	Abra	0.146
		Compostela Valley Province	0.446	Apayao	0.144
		Zamboanga del Sur	0.442	Basilan	0.143
		Biliran	0.441	Maguindanao	0.142
		Zamboanga Sibugay	0.439	Tawi-Tawi	0.127
		Siquijor	0.437	Sulu	0.078
		Mountain Province	0.436		
		Isabela	0.430		
		Bukidnon	0.416		
		North Cotabato	0.415		
		Antique	0.415		
		Zamboanga del Norte	0.414		
		Lanao del Sur	0.413		
		Agusan del Sur	0.408		

Laguna emerged as the province with the highest level of financial inclusion (FII = 0.961). Three other provinces in Region IV-A are in the top 5, namely: Cavite, Batangas, and Rizal. Benguet got the top 4 spot.[11] The provinces where Cebu City and Davao City are located are in the 6th and 7th place, respectively.

On the other hand, Sulu obtained the lowest FII value (0.078), followed by three other provinces in ARMM (Tawi-tawi, Maguindanao, and Basilan). Next are two provinces from the Cordillera Administrative Region (Abra and Apayao) and two provinces from Eastern Visayas (Eastern and Northern Samar). Looking at these provinces, some possible reasons may be deduced as to why they have the lowest levels of financial inclusion: 1) continuing conflicts and problems on peace and order; 2) mountainous terrain; and 3) high poverty incidence and being prone to typhoons.
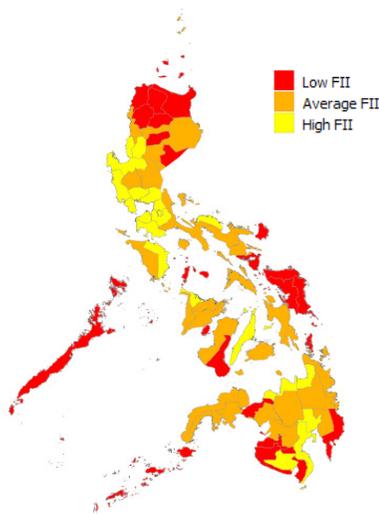
**Figure 2. Choropleth map of the Philippines
based on provincial FIIs**

Figure 2 shows the spatial map of the provinces based on their FII. The map shows sign of geographical clustering wherein the magnitude of the FII in one province is similar with that of its neighboring provinces.

The existence of spatial autocorrelation was formally tested and the results are given in Table 5. The estimated Moran's index[12] suggests that there is positive spatial autocorrelation. This means that nearby provinces tend to exhibit similar levels of financial inclusion.

Table 5. Test for Spatial Autocorrelation

Moran's Index	Standard Deviation	z-stat	p-value
0.128	0.021	6.595	0.000

Figures 3 decomposes the FII based on the two dimensions - access and usage. The ideal point is $W = (\omega_1, \omega_2) = (0.5, 0.5)$ while the worst point is the origin $O = (0, 0)$. If a province's point is represented by $D = (d_1^*, d_2^*)$, its FII will be high if there is larger distance between D and O, and smaller distance between D and W.

Note that the points are more concentrated on the left half of the horizontal axis, indicating that most provinces still have low level of access. The upper right quadrant (**Q1**), which contains the provinces with high FII, is the group with high access and high usage. The lower left quadrant (**Q3**), which contains the provinces with low FII, is the group with low access and low usage. Note that very few provinces are in the lower right quadrant (**Q4**), suggesting that it is less likely

for usage to be low if access is high. This may indicate that access reinforces usage. Note also that if a trend line will be fitted on the scatter plot, it will have a positive slope providing further indication that access and usage are positively correlated.
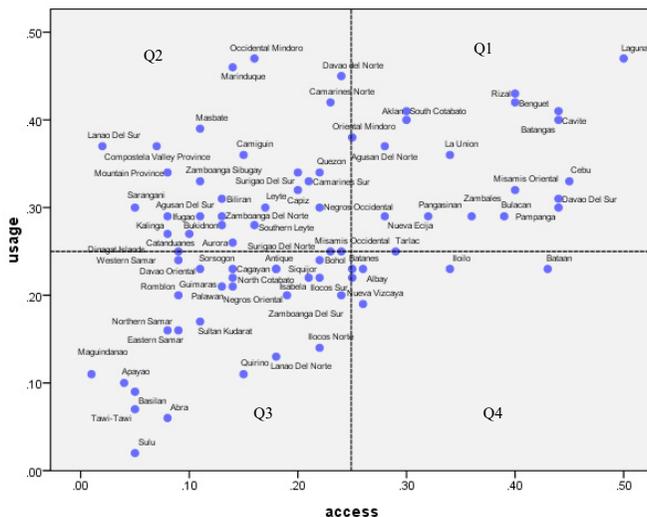

Figure 3. Access and usage dimensions of the FII

It may be interesting to look at the relationship between the FII and some variables that are often linked to financial inclusion. These include income, poverty, and other factors such as literacy and employment. The study also looked at the correlation between the FII and other popular indices such as the HDI and the Provincial Competitiveness Index.

The plots show that financial inclusion, as measured by the FII, is inversely related with poverty. Financial inclusion has significant negative correlation $(r = -0.61)$ with poverty which means that higher level of financial inclusion is associated with lower poverty incidence, and vice versa. This supports the theoretical literature linking financial inclusion with improved welfare.

Financial inclusion is also very much related to income, literacy, and employment so we correlated the FII with these variables. There is positive correlation wherein higher income, more years of schooling, and a larger percentage of working population are associated with higher levels of financial inclusion. The same is true with the HDI and the Provincial Competitiveness Index since the FII moves in the same direction with these indices. As the level of a province's human development and competitiveness increases, financial inclusion tends to increase as well.
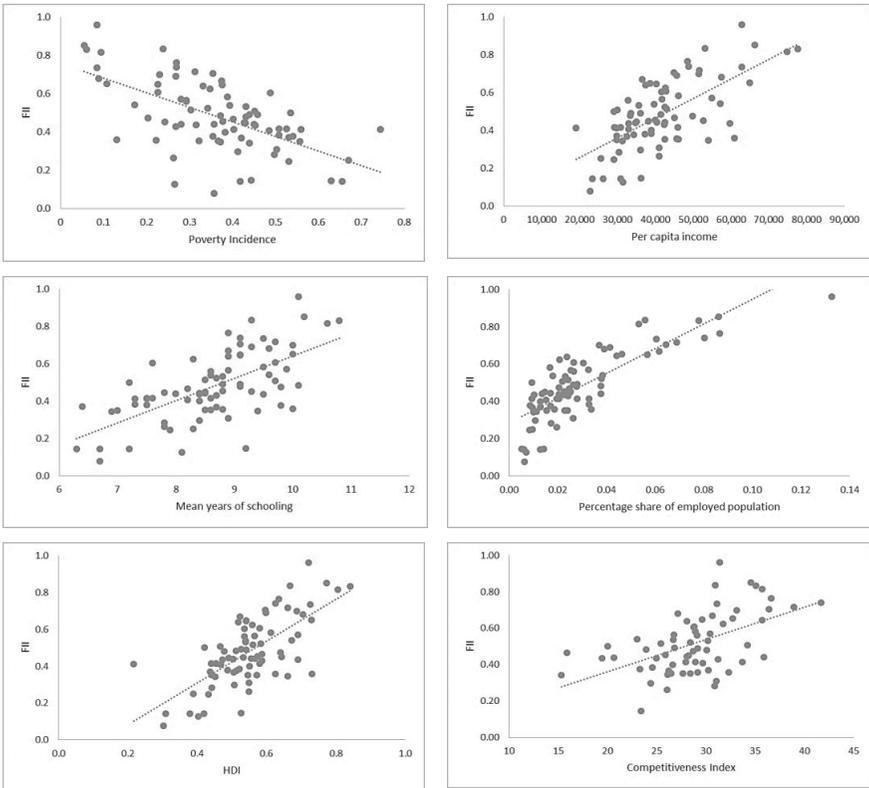
Figure 4. Relationship Between FII and Other Variables

6. Concluding Notes

On the methodological side, this study is only the first step in the direction of appropriately measuring financial inclusion in the Philippines. Improvements and technical innovations in constructing the FII are possible, and it is hoped that this paper could further stimulate interest to conduct more studies related to financial inclusion. For instance, the FII can be used in econometric models requiring a measure of financial inclusiveness. It can serve as a response variable in regression models to identify the key drivers of financial inclusion. Alternatively, the FII can be used as a regressor to test whether financial inclusion significantly contributes to certain outcomes.

The FII can be recalculated using updated supply-side data for the access indicators and the 2015 FIES dataset for the usage indicators. In this way, we can track progress and identify provinces with the least and greatest improvement.

With respect to the data requirements, the study highlighted the need to have a survey that will be able to generate provincial statistics on the percentage of

households with access to formal savings, credit, and insurance. The inclusion of rider questions in the FIES may merit consideration, since it is the only relevant survey which can produce provincial estimates. Ownership of transactional accounts for payments and remittance can be also added as another usage indicator. Improving the data elements of the FII can be explored in the Data and Measurement Working Group of the Financial Inclusion Steering Committee, where both the BSP and the PSA are members.

On the empirical front, the study demonstrated that there are marked disparities among provinces in terms of financial inclusion. Greater disparities are expected if city- and municipal-level FIIs will be generated. This may be explored in the future as more granular data on financial inclusion becomes available. The existence of geographical clustering should be taken into account because as seen in this study, financial inclusion is also a spatial phenomenon.

The potential of financial inclusion to improve welfare is already a compelling reason to formulate deliberate measures aimed at increasing access to and usage of formal financial services. The provinces identified to have low level of financial inclusion based on the FII deserve attention if an inclusive financial system that supports inclusive growth is the ultimate goal.

NOTES

1   BSP Main Complex, A. Mabini St., Malate, Manila

2   Quirino Ave. cor. TM Kalaw St., University of the Philippines, Diliman, Quezon City

3   Following World Bank's definition, formal account often refers to an account at a bank or other formal financial institutions (e.g., cooperatives, microfinance institutions) which can be used to save money, send or receive funds, make payments, and may include mobile money accounts as well.

4   The NSFI is a comprehensive document developed thru a consultative process with private and public sector stakeholders involved in financial sector development, to systematically accelerate the level of financial inclusion in the Philippines. It was initially crafted by the BSP and 12 other government agencies, including the Philippine Statistics Authority (PSA).

5   The proportion of the variance explained by the corresponding factor to the total variance was used as weight of the variable in the corresponding dimension. See page 16 of Amidzic et al (2014).

6   Alternatively, weights can be derived using PCA or FA. While this approach allows objective assignment of weights, the tendency is to assign heavier weights to indicators or dimensions where there is greater variability. The advantage of an exogenous weighting scheme is that users will be able to assign heavier weights to indicators or dimensions deemed more important. This feature is particularly relevant for policymakers.

7   There are two other dimensions of financial inclusion namely, quality and welfare. Quality refers to consumer experience and measures the relevance of financial

products and services, while welfare refers to the impact that financial inclusion brings to the people. However, these dimensions are more qualitative in nature and data availability at the subnational level is a limitation.

8   One may raise the issue that access indicators are based on individual adults while usage indicators are based on households. This is because of limitations in available data. Currently, there are three demand-side surveys related to financial inclusion (NBSFI, Consumer Finance Survey or CFS, and FIES). The NBSFI is the only survey based on adults, but it can only generate estimates at the national level and by major island groups (NCR, Balance Luzon, Visayas, Mindanao). CFS and FIES are household surveys, and only FIES can produce provincial estimates.

9   Following Tukey's method of outliers, $Q_3 + 1.5(Q_3 - Q_1)$ is the "upper fence" in boxplot construction.

10   Due to lack of a specific question in the FIES asking if the household has an outstanding loan from a formal financial institution, the estimate on the percentage of households with credit is based on the question asking the household if it has cash loan payments during the period specified.

11   It is interesting to note that in other subnational indices such as HDI, Benguet also belongs to the top 5.

12   Moran's I is a well-known measure of spatial dependence. Its range of possible values is from -1 to 1, where a positive value indicates that similar values are more likely than dissimilar values between neighbors. Higher values of Moran's I indicate stronger geographical clustering. A zero value indicates a random spatial pattern.

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