

[DOI: 10.20472/EFC.2022.016.016](https://doi.org/10.20472/EFC.2022.016.016)

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## **THE INTEGRATION OF LIFE AND NON-LIFE INSURANCE IN FINANCIAL INCLUSION INDEX**

### **Abstract:**

Motivated by the lack of a harmonised financial inclusion measure in the existing literature which accounts for the role of insurance, this paper constructs a multidimensional financial inclusion index which incorporates life and non-life insurance indicators for 79 countries for the year 2019. The computed financial inclusion indices reveal higher financial inclusion in high-income countries in Europe region vis-à-vis that of medium-income countries from the Asian and African regions. When only life insurance indicators are considered, some countries leapfrogged in their financial inclusion level whereas most of the developed and developing countries see a decline in their financial inclusion. On the other hand, non-life insurance appears to have only marginal positive impact on overall financial inclusiveness in the sample countries. The findings of this study indicate the lack of contribution of the insurance spectrum of financial services to financial inclusion.

### **Keywords:**

Life Insurance, Non-Life Insurance, Financial Inclusion

## 1 INTRODUCTION

Financial exclusion is defined as processes that prevent certain social groups and individuals from gaining access to the formal financial system (Leyshon & Thrift, 1995) or the inability, difficulty, or reluctance to access appropriate mainstream financial services (Mitton, 2008). Generally, financially excluded people are characterised by the absence of a formal bank account and access to relevant financial services such as insurance, savings products, and pensions with implications to new dimensions of poverty (Luczak, 2022) such as housing poverty (Hromada, 2021) or newly discussed energy poverty (Cermakova, 2022). The most vulnerable group in this context is the young generation (Varinder, 2020, or Valecky, 2020). Financially excluded people may rely heavily on informal financial services, limiting their potential to save, invest and accumulate wealth.

Based on findings of the Global Findex Database for year 2017, financial exclusion remains a pervasive phenomenon where over 1.7 billion people are involuntarily deprived of formal financial service facilities, thereby compromising the optimal allocation of capital resources and subsequently robust economic growth. Meanwhile, many of those with access to formal financial services persistently fail to utilise them, making one-third of the global adult population unbanked or underbanked and suffering from financial instability. This population generally belong to vulnerable groups such as the poor, racial and ethnic minorities, women, and individuals with chronic conditions (William & Fifer, 1994). Therefore, financial inclusion is imperative to help bridge the gaps by providing individuals, households, and firms with extensive access to financial resources to support their consumption and investment needs.

As part of the financial inclusion continuum, insurance is a crucial enabler of sustainable development as it protects against unexpected financial shocks that set back development progress. Inclusive insurance allows vulnerable groups to access various instruments that protect their lives, health, and assets by covering unforeseen costs and removing additional costs inherent in insurance products (Clamara & Tuesta, 2015). Besides, insurance builds resilience by providing a financial safety net and protection for individuals and firms. While the inclusion of insurance in the computation of financial inclusion index is not new, studies which distinguish between life and non-life insurance remain scarce. For instance, Zhu et al. (2018) only consider the number of insurance institutions per 10,000 people as their proxy indicator, whereas Kanga et al. (2021) only consider the total insurance premium. The rationale for distinguishing between life and non-life insurance is provided by Demir et al. (2022), who found influence of different dimensions of insurance on the causal relationship between finance and sustainability.

Is there a distinction in the financial inclusion indices when life and non-life insurance are incorporated into the computation of financial inclusion indices separately? With this research question in mind, this study constructs two comprehensive financial inclusion index by

incorporating the role of life and non-life insurance and compares them against the banking-only financial inclusion index. The findings of this study could provide a new perspective to policymakers, regulators, and academics in their attempt to understand financial inclusion at a more detailed level and formulation of appropriate policy strategies, targeting particular components of financial inclusion, to further enhance the level of financial inclusiveness in their respective countries.

## 2 LITERATURE REVIEW

In the extant literature, there has yet to be a standard to measure financial inclusion level. While approaches to measure financial inclusion vary across studies, the consensus is that a good financial inclusion measurement should satisfy criteria like (i) the ability to embody multiple dimensions of financial inclusion, (ii) uncomplicated calculations, and (iii) cross-country comparability (Chattopadhyay, 2011). The work of Beck et al. (2007) is one of the first studies to measure financial inclusion at a country level looking at two dimensions of financial inclusion, namely access and use of financial services. They also incorporate new indicators for services such as deposits, loans and payments. Meanwhile, Honohan (2008) measures financial inclusion in a cross-country study by estimating only the adult population who own a bank account and made no distinction between different dimensions of financial inclusion.

Sarma (2015) is the first to construct a multidimensional financial inclusion index using a non-parametric method. This method is identical to the United Nations Development Programme (UNDP) for computing the well-known human development index (HDI) and gender development index (GDI). Her computation of financial inclusion index involves a three-step process: (1) identify dimensions and select their relevant indicators; (2) normalise the selected indicators so that they are comparable, and (3) assign appropriate weights to each dimension and their indicators before aggregating them into a single financial inclusion index. Using availability, usage, and banking penetration as the dimensions, the author computed financial inclusion indices 49 sample countries in a single year. Sarma's (2015) methodology in constructing financial inclusion indices has garnered considerable attention from scholars examining financial inclusion (see the works of Park and Mercado (2015) and Wang and Guan (2017)).

The measurements of financial inclusion not only differ in terms of the approach but also on the indicators, more specifically, the types of financial service. While banking services have long been the considered in quantifying financial inclusion, Hou and Cheng (2017) emphasise the importance of non-banking financial products, such as insurance, stocks, and mutual funds, in upholding growth. Dahiya and Kumar (2020) further call for future studies to not only focus on banking products but also consider other financial services such as insurance, pension and remittances. Nonetheless, only limited studies in the financial inclusion literature have

emphasised the role of insurance and included insurance-related indicators in the computations. Of the limited studies, Zhu et al. (2018) include insurance indicators such as the number of insurance institutions per 10,000 people, number of insurance institutions per 10,000 square km, insurance density, and insurance depth while Kanga et al. (2021) use insurance premiums (life and non-life) to GDP, in measuring the penetration dimension of financial inclusion.

In the limited studies which do incorporate the effect of insurance on financial inclusion, the effects of life and non-life insurance are not distinguished. Given the differing natures of life and non-life insurance with the former providing the investment fund for infrastructures like banks and insurance branches while providing a safety net for individuals and their households while the latter is related to mandatory insurance schemes such as motor vehicle insurance aimed at reducing risk and channel funds to encourage business activities throughout the economy (Lee & Lin, 2016), it is then worth exploring the degree to which life and non-life insurance contribute to financial inclusion.

### 3 METHODOLOGY

This study follows the approach of Sarma (2015) to construct a multidimensional financial inclusion index incorporating three dimensions, namely availability, accessibility and usage of financial services. In this study, initial dimension index ( $d_i$ ) is calculated, using the formula in Equation (1), for each dimension of financial inclusion. For dimension with more than one indicator, the dimension index is computed as simple weighted average of all indicators.  $w_i$  denotes the weight assigned to dimension  $i$  which takes the value ranging from 0 to 1. Greater value of  $w_i$  signifies greater importance of dimension  $i$  in quantifying financial inclusion. Meanwhile,  $A_i$  is the actual value of dimension  $i$ .  $M_i$  and  $m_i$  are the upper bound and lower bound of dimension  $i$ , respectively. The values for  $M_i$  and  $m_i$  are determined by some pre-specified rules. The dimension indices measure a country's achievement in the respective dimension.

$$d_i = w_i \frac{A_i - m_i}{M_i - m_i} \quad (1)$$

After computing the three dimensions, namely availability, accessibility and usage, and assigning the same weight for all the dimensions, the composite financial inclusion index (FII) for a country is computed using Equation (2).

$$FII = \frac{1}{2} \left[ \frac{\sqrt{d_1^2 + d_2^2 + d_3^2}}{\sqrt{3}} + \left( 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + (1-d_3)^2}}{\sqrt{3}} \right) \right] \quad (2)$$

For the purpose of this study, the sub-indicators for availability, accessibility and usage dimensions are segmented into banking-related and insurance-related:

- a. Availability – In order to capture whether financial services are obtainable, this study uses (i) number of depositors with commercial banks per 1,000 adults, (ii) number of borrowers from commercial banks per 1,000 adults, (iii) number of credit cards per 1,000 adults, (iv) life insurance density (ratio of life insurance premium to population), and (v) non-life insurance density (ratio of non-life insurance premium to population).
- b. Accessibility – To ensure universal access to formal financial services, this study includes (i) number of ATMs per 100,000 adults and (ii) number of conventional insurance corporations per 100,000 adults.
- c. Usage - The consumption of financial services includes: (i) outstanding loans from commercial banks (% of GDP), (ii) outstanding deposits with commercial banks (% of GDP), (iii) total life insurance premium (% of GDP), and (iv) total non-life insurance premium (% of GDP).

This study uses data on all three dimensions (availability, access, and usage) for 79 countries for the year 2019. The year 2019 is chosen as it is the latest year where the data is available for a reasonable number of countries. Data for the indicators listed above are obtained from the International Monetary Fund (IMF) and World Bank.

#### 4 RESULTS AND ANALYSIS

This study computes three financial inclusion indices for 79 countries for year 2019. The indices computed are banking-only financial inclusion index ( $FI_B$ ), banking-and-life-insurance financial inclusion index ( $FI_{BL}$ ) and lastly banking-and-non-life financial inclusion indicators ( $FI_{BNL}$ ). Countries are deemed to have high level of financial inclusion if the financial inclusion index computed falls between 0.5 and 1, moderately financially inclusive when the index falls between 0.3 and 0.5 and low level of financial inclusion if the index is below 0.3.

**Table 1: Top and bottom 10 countries ranked by  $FI_B$ ,  $FI_{BL}$  &  $FI_{BNL}$**

<b>Panel A: Banking-only Financial Inclusion Index (<math>FI_B</math>)</b>					
<b>Top 10 Countries</b>	<b>FI index</b>	<b>Rank</b>	<b>Bottom 10 Countries</b>	<b>FI index</b>	<b>Rank</b>
Luxembourg	0.538	1	Lithuania	0.103	70
Singapore	0.484	2	Bolivia	0.087	71
Israel	0.440	3	Nicaragua	0.083	72
Portugal	0.437	4	Kenya	0.076	73

Poland	0.417	5	Côte d'Ivoire	0.059	74
Uruguay	0.411	6	Pakistan	0.053	75
South Korea	0.406	7	Azerbaijan	0.048	76
Chile	0.378	8	Mozambique	0.047	77
China	0.367	9	Uganda	0.019	78
Thailand	0.356	10	Malawi	0.015	79
<b>Panel B: Banking-and-Life-Insurance Financial Inclusion Index (<math>FI_{BL}</math>)</b>					
Top 10 Countries	FI index	Rank	Bottom 10 Countries	FI index	Rank
Luxembourg	0.525	1	Dominican Republic	0.088	70
South Korea	0.506	2	Bolivia	0.074	71
Singapore	0.492	3	Nicaragua	0.067	72
Portugal	0.415	4	Kenya	0.067	73
Israel	0.385	5	Pakistan	0.047	74
Uruguay	0.378	6	Côte d'Ivoire	0.045	75
Poland	0.362	7	Azerbaijan	0.042	76
Italy	0.354	8	Mozambique	0.037	77
Thailand	0.347	9	Malawi	0.019	78
Chile	0.338	10	Uganda	0.017	79
<b>Panel C: Banking-and-Non-Life-Insurance Financial Inclusion Index (<math>FI_{BNL}</math>)</b>					
Country	FI index	Rank	Country	FI index	Rank
South Korea	0.620	1	Honduras	0.104	70
Luxembourg	0.519	2	Nicaragua	0.087	71
Portugal	0.425	3	Bolivia	0.080	72
Israel	0.423	4	Kenya	0.070	73
Singapore	0.412	5	Mozambique	0.055	74
Uruguay	0.411	6	Côte d'Ivoire	0.046	75
Australia	0.405	7	Azerbaijan	0.044	76
Poland	0.385	8	Pakistan	0.040	77
Austria	0.370	9	Malawi	0.027	78
Iceland	0.362	10	Uganda	0.019	79

*Source: own calculation based on the research results*

Financial inclusion indices constructed using banking indicators served as the baseline as the formal banking system has been the key driver of financial inclusion for the past decades and it is also the most commonly used by scholars to measure the degree of financial inclusion (Sarma, 2015; Beck et al., 2007). Panel A of Table 1 shows that among the 79 countries, Luxembourg leads with the highest value of financial inclusion index. According to the standard set above, Luxembourg is the only country with a high financial inclusion, possibly attributed to the launching of ADA (Appui au Développement Autonome) over 25 years ago aimed at reducing poverty. Trailing Luxembourg are Singapore, Israel, Portugal, Poland, Uruguay, South Korea, Chile, China and Thailand. With the exceptions of China and Thailand, it is noticed that most

countries in the Top 10 are high-income countries where financial services have long played a role in supporting their economic growth. On the other end of the spectrum, the least-developed African countries like Mozambique, Uganda and Malawi ranked the lowest among the 79 countries, with the FI Index of 0.047, 0.019, and 0.015, respectively. This is consistent with the statistics showing that African countries contribute the largest percentage of the world's unbanked and underbanked. Financial exclusion remains a key challenge in the Asian and African regions, where the benefits of broadening financing options are not being shared equally.

When life insurance is considered in computing the financial inclusion indices, Panel B of Table 1 shows that only selected countries witness improvement in their financial inclusiveness. Notably, South Korea is the major beneficiary of life insurance, given the improvement of its ranking from 7<sup>th</sup> to 2<sup>nd</sup> with the financial inclusion index increasing from 0.406 for  $FI_B$  to 0.506 for  $FI_{BL}$ . This could possibly be explained by the growth in the Korean life insurance industry. Meanwhile, in most developed countries like Luxembourg, Portugal, Spain, and Belgium, financial inclusion indices lowered when life insurance is considered. This could be due to the universal social welfare system that provides a safety net for every citizen in European countries. The same decline in financial inclusiveness is also observed for the bottom 10 countries for  $FI_{BL}$ .

Panel C of Table 1 presents the top and bottom 10 countries ranked by banking-and-non-life-insurance financial inclusion index ( $FI_{BNL}$ ). After considering non-life insurance, the financial inclusion index for Korea improved from 0.538 to 0.620, surpassing that of Luxembourg to rank first among the 79 countries. This further reinforces the importance of insurance, both life and non-life, among South Koreans. Singapore instead saw its financial inclusiveness dropping from 0.484 to 0.412, with its ranking drops from 2<sup>nd</sup> to 4<sup>th</sup>. The drop is expected as the Singapore non-life insurance segment recorded a financial loss in 2019 for the first time in a decade. It is important to note that non-life insurance does not benefit most countries in terms of their financial inclusion level, with most countries witnessing a drop in the  $FI_{BNL}$  vis-à-vis  $FI_B$ . Unsurprisingly, African countries remain the lowest in terms of financial inclusion worldwide, with or without insurance.

Table 2 presents selected descriptive statistics for the absolute difference between the three indices computed. On average, the banking-and-life-insurance financial inclusion indices computed for the sample countries in this study are 0.0135 lower compared to the baseline indices considering only accessibility, availability and usage of banking services. This is in contrast to the banking-and-non-life-insurance financial inclusion indices ( $FI_{BNL}$ ) which illustrate a marginally better financial inclusiveness in the sample countries given that the  $FI_{BNL}$  is on average 0.0059 higher than  $FI_B$ . Looking at the dispersion of the differences of the  $FI_B-FI_{BL}$  and  $FI_B-FI_{BNL}$  pairs, it is noticed that the latter exhibits greater variations in financial inclusiveness among the sample countries, suggesting greater degree of differences in the accessibility, availability and usage of non-life insurance in these countries. Other statistics such as median, mode, maximum and minimum among the two pairs are not significantly different.

**Table 2: Descriptive statistics of absolute difference in financial inclusion indices**

<i>Absolute Difference Between</i>	Mean	Median	Mode	Standard Deviation	Skewness	Minimum	Maximum
$F_B$ & $F_{BL}$	-0.0135	-0.02	-0.01	0.0425	2.9813	-0.06	0.21
$F_B$ & $F_{BNL}$	0.0059	-0.01	-0.02	0.0483	1.8996	-0.07	0.21

Source: own calculation based on the research result.

Note:  $F_B$  denoted the banking-only financial inclusion index,  $F_{BL}$  is the banking-and-life-insurance financial inclusion index and lastly,  $F_{BNL}$  denotes the banking-and-non-life-insurance financial inclusion index.

## 5 CONCLUSION

This paper proposes three multidimensional financial inclusion indices that could be used to compare the extent of financial inclusion across different economies and to monitor the progress of the economies with respect to financial inclusion over time. Such indices can also be of use to researchers to address empirical questions on the relationship between development and insurance-related financial inclusion.

Unsurprisingly, high-income countries in the European region tend to have higher financial inclusion than medium-income countries from Asia and African region, though with some exceptions. This could be because of their relatively more developed and inclusive financial system as well as social security system. When life insurance indicators are considered, some countries leapfrogged in their financial inclusion level whereas most of the developed and developing countries see a decline in their financial inclusion. This is mostly due to low-growth in the developed insurance market and the dominance of banking sectors in relation to insurance sectors in developing countries. Meanwhile, non-life insurance marginally benefits the sample countries, on average, in terms of their financial inclusiveness.

We believe that this study could have potentially important policy implications. As the importance of insurance is still overlooked in many countries, seeing its inclusion in National Financial Inclusion Strategy (NFIS) is an opportunity to address the financial sector without heavy reliance on the banking industry. To date, only 17 out of 36 jurisdictions in AFI has included insurance as the central pillar in their NFIS due to lack of guidance and other priorities, further highlighting the need to look into this segment of financial services to achieve greater financial inclusiveness.



## 6 ACKNOWLEDGEMENT

The authors acknowledge the research support from the Fundamental Research Grant Scheme (FRGS/1/2021/SS01/UTAR/02/4) by the Ministry of Higher Education Malaysia and the UTAR Research Fund (IPSR/RMC/UTARRF/2021-C1/L02) by Universiti Tunku Abdul Rahman.

## 7 REFERENCE

- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, Inequality and the Poor: Cross-Country Evidence. *Journal of Economic Growth*, 12, 27-49.
- Cermakova, K.; Hromada, E. Change in the Affordability of Owner-Occupied Housing in the Context of Rising Energy Prices. *Energies* 2022, 15, 1281. <https://doi.org/10.3390/en15041281>
- Chattopadhyay, S.K. (2011). Financial Inclusion in India: A case-study of West Bengal. *MPRA Paper No. 34269*. Retrieved from <https://mpra.ub.uni-muenchen.de/34269/>
- Clamara, N. & Tuesta, D. (2015). Factors that Matter for Financial Inclusion: Evidence from Peru. *The IEB International Journal of Finance*, 10, 8-29.
- Dahiya, S., & Kumar, M. (2020). Linkage between Financial Inclusion and Economic Growth: An Empirical Study of the Emerging Indian Economy. *Vision*, 24(2), 184–193.
- Demir, A., Pesqué-Cela, V., Altunbas, V. & Murinde, V. (2022). Fintech, Financial Inclusion and Income Inequality: A Quantile Regression Approach. *The European Journal of Finance*, 28(1), 86-107.
- Honohan, P. (2008). Cross-Country Variation in Household Access to Financial Services. *Journal of Banking & Finance*, 32(11), 2493-2500.
- Hou, H., & Cheng, S.Y. (2017). The dynamic effects of banking, life insurance, and stock markets on economic growth. *Japan and the World Economy*, 41, 87–98.
- Hromada, E., Cermakova, K. (2021). Financial Unavailability Of Housing In The Czech Republic And Recommendations For Its Solution. *International Journal of Economic Sciences*, Vol. X(2), pp. 47-58. , DOI: 10.52950/ES.2021.10.2.003
- Kanga, D., Oughton, C., Harris, L., & Murinde, V. (2021). The Diffusion of Fintech, Financial Inclusion and Income Per Capita. *The European Journal of Finance*, 28(1), 108-136.
- Leyshon, A. & Thrift, N. (1996). Financial Exclusion and the Shifting Boundaries of the Financial System. *Environment and Planning A*, 28, 1050-1056.

- Łuczak, A., Kalinowski, S. (2022). A multidimensional comparative analysis of poverty statuses in European Union countries. *International Journal of Economic Sciences*, Vol. XI(1), pp. 146-160. , DOI: 10.52950/ES.2022.11.1.009
- Mitton, L. (2008). Financial Inclusion in the UK: Review of Policy and Practice. *Joseph Rowntree Foundation*.
- Park, C.Y. & Mercado, R. (2015). Financial Inclusion, Poverty, and Income Inequality in Developing Asia. *Asian Development Bank, Metro Manila*.
- Sarma, M. (2015). Measuring financial inclusion. *AccessEcon*, 35(1), 604-611.
- Valecky, J. (2020). Note on mismodelling of policyholder's age in claim frequency model: a matter of gender in vehicle insurance. *International Journal of Economic Sciences*, Vol. IX(1), pp. 224-240. , DOI: 10.52950/ES.2020.9.1.012
- Varinder, G., Li, F. Ch., Matovu, Ch. (2020). Analysis of Factors that Influence Financial Literacy of Millennials in Canada. *International Journal of Economic Sciences*, Vol. IX(1), pp. 83-101. , DOI: 10.52950/ES.2020.9.1.005
- Wang, X., & Guan, J. (2017). Financial inclusion: measurement, spatial effects and influencing factors. *Applied Economics*, 49(18), 1751-1762.
- William R. & Fifer, M.D. (1994). At Risk in America: The Health and Health Care Needs of Vulnerable Populations in the United States. *Journal of the American Medical Association*, 271(3), 246-247.
- Zhu, B., Zhai, S. & He, J. (2018). Is the development of China's financial inclusion sustainable? Evidence from a perspective of balance. *Sustainability*, 10(4), 1–16.