

Eshun, Samuel Fiifi; Kočenda, Evžen

**Working Paper**

## Determinants of financial inclusion in Africa and OECD countries

IES Working Paper, No. 18/2023

**Provided in Cooperation with:**

Charles University, Institute of Economic Studies (IES)

*Suggested Citation:* Eshun, Samuel Fiifi; Kočenda, Evžen (2023) : Determinants of financial inclusion in Africa and OECD countries, IES Working Paper, No. 18/2023, Charles University in Prague, Institute of Economic Studies (IES), Prague

This Version is available at:

<https://hdl.handle.net/10419/286347>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



INSTITUTE  
OF ECONOMIC STUDIES  
Faculty of Social Sciences  
Charles University

# DETERMINANTS OF FINANCIAL INCLUSION IN AFRICA AND OECD COUNTRIES

*Samuel Fiiifi Eshun*  
*Evžen Kočenda*

IES Working Paper 18/2023

$$\frac{1!}{(m-1)!} p^{m-1} (1-p)^{n-m} = p \sum_{\ell=0}^{n-1} \frac{\ell+1}{n} \frac{(n-1)!}{(n-1-\ell)! \ell!} p^{\ell} (1-p)^{n-1-\ell} = p \frac{n-1}{n} \sum_{\ell=0}^{n-1} \left[ \frac{\ell}{n-1} + \frac{1}{n-1} \right] \frac{(n-1)!}{(n-1-\ell)! \ell!} p^{\ell} (1-p)^{n-1-\ell} = p^2 \frac{n-1}{n} +$$

Institute of Economic Studies,  
Faculty of Social Sciences,  
Charles University in Prague

[UK FSV – IES]

Opletalova 26  
CZ-110 00, Prague  
E-mail : [ies@fsv.cuni.cz](mailto:ies@fsv.cuni.cz)  
<http://ies.fsv.cuni.cz>

Institut ekonomických studií  
Fakulta sociálních věd  
Univerzita Karlova v Praze

Opletalova 26  
110 00 Praha 1

E-mail : [ies@fsv.cuni.cz](mailto:ies@fsv.cuni.cz)  
<http://ies.fsv.cuni.cz>

**Disclaimer:** The IES Working Papers is an online paper series for works by the faculty and students of the Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague, Czech Republic. The papers are peer reviewed. The views expressed in documents served by this site do not reflect the views of the IES or any other Charles University Department. They are the sole property of the respective authors. Additional info at: [ies@fsv.cuni.cz](mailto:ies@fsv.cuni.cz)

**Copyright Notice:** Although all documents published by the IES are provided without charge, they are licensed for personal, academic or educational use. All rights are reserved by the authors.

**Citations:** All references to documents served by this site must be appropriately cited.

**Bibliographic information:**

Eshun S.F., Kočenda E. (2023): "Determinants of Financial Inclusion in Africa and OECD Countries" IES Working Papers 6/2023. IES FSV. Charles University.

This paper can be downloaded at: <http://ies.fsv.cuni.cz>

# Determinants of Financial Inclusion in Africa and OECD Countries

Samuel Fiifi Eshun<sup>a</sup>

Evžen Kočenda<sup>b</sup>

<sup>a</sup>Institute of Economic Studies, Charles University, Prague, Czech Republic.  
Email: 26453053@fsv.cuni.cz.

<sup>b</sup>Institute of Economic Studies, Charles University, Prague, Czech Republic;  
Department of Banking and Insurance, Faculty of Finance and Accounting, Prague  
University of Economics and Business, Prague; Institute of Information Theory and  
Automation of the CAS, Prague; CESifo Munich; IOS Regensburg; and the Euro  
Area Business Cycle Network. Email: evzen.kocenda@fsv.cuni.cz.

May 2023

## **Abstract:**

Using a dynamic panel data analysis, we explore the factors influencing financial inclusion in Sub-Saharan Africa (SSA) and countries belonging to the Organization for Economic Co-operation and Development (OECD). We employ the System Generalized Method of Moments (GMM) estimator and assess 31 SSA and 38 OECD countries from 2000-2021. We found that the differences in trade openness, banks' efficiency, income, and remittances are some macro-level factors that explain the variation in financial inclusion levels. We highlight the importance of quality literacy policies, trade improvement with restrictions on cross-border capital flows, and a more efficient financial system to promote financial inclusion.

**JEL:** C23, E44, F65, G21, O16, O57

**Keywords:** Financial Inclusion, Financial Inclusion Index, Sub-Saharan Africa (SSA), Organization for Economic Co-operation and Development (OECD), System Generalized Methods of Moments (GMM)

**Acknowledgements:** We are grateful for the useful comments we received from Martin Hodula, Harriet Kwartemaa, Dorcas Nduakoh, Nathaniel Obuobi, Jimmy Oppong, Binyi Zhang, the anonymous referee and presentation participants. This working paper is part of a project GEOCEP that has received funding from the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 870245. The usual disclaimer applies.

# 1 INTRODUCTION

Financial inclusion represents the provision of financial services and products to unbanked and underbanked populations at an affordable cost (Chibba, 2009). Through a more robust financial system, it supports the channel of funds from surplus spending units to deficit spending units to embark on economic activities that will ensure economic growth (Sethi & Acharya, 2018). As such, there is a widespread acceptance and growing convergence among researchers in developed countries (such as those in the high-income OECD) and developing countries (such as Sub-Saharan African countries) on financial inclusion as one of the main pillars of global development (Barik & Lenka, 2022; Morgan & Pontines, 2018; Ohiomu & Ogbeide-Osaretin, 2019; Xu & Sun, 2022). On the other hand, identifying the key factors that promote financial inclusion and accessibility to formal financial services is not fully understood yet, but it is essential to fully utilise financial inclusion as a policy tool. Therefore, in this paper, we aim to assess the determinants of financial inclusion, explore how they differ in their influence across comparable regions, and identify the international determinants of financial inclusion practices common in regional groups.

Globally, there are 1.4 billion adults who do not have access to financial services, either through a traditional bank or a mobile banking provider. (Demirgüç-Kunt et al., 2022). The 2021 Global Financial Inclusion Index report compared the level of financial inclusion globally and found that, on average, Sub-Saharan Africa (SSA) has one of the lowest levels of financial inclusion with a count of 55.1%. (Demirgüç-Kunt et al., 2022).<sup>1</sup> Seven economies, including Nigeria, a Sub-Saharan African country, and Egypt, rank in the top five countries and make up 54% of the unbanked population. Moreover, in high-income economies, this disparity is minimal, as almost all adults in these economies have access to financial accounts. (Demirgüç-Kunt et al., 2022).

This issue of low financial inclusion in Sub-Saharan Africa (SSA) and other regions is disturbing, especially considering its potential to foster inclusive economic wealth (Ugwuanyi et al., 2022). Despite significant investments made to increase accessibility to financial services (Demirgüç-Kunt et al., 2022; Gebregziabher Gebrehiwot & Makina, 2019), there are still disparities in financial inclusion levels, and this may be from the variations in the predictive power

---

<sup>1</sup> In contrast, East Asia & Pacific region accounts for the highest level of financial inclusion of 80.9%, followed by Europe & Central Asia (77.8%), Latin America & Caribbean (72.9%), and South Asia (67.9%), while they are low in the Middle East & North Africa region (48.1%) (Demirgüç-Kunt et al., 2022).

of factors like jurisdictions, environment, and regulations. To gain insight into the various factors contributing to financial inclusion, it is key to examine regional developments and compare them with experiences from other regions. This approach can provide a point of reference for improving financial inclusion, helping form a set of common practices and policies and fill in gaps in existing research.

As such, we aim to examine the predictive factors that could influence financial inclusion in 31 SSA countries by using OECD countries as a benchmark. Given that SSA is one of the least financially inclusive regions and falls behind in comparison to the highly financially inclusive regions of the world, this study aims to contribute to promoting greater inclusion in SSA. The findings of this study could be particularly significant for policymakers in SSA, as the region lags behind advanced countries in terms of financial inclusion.

We use the System Generalized Method of Moments (GMM) dynamic panel estimator to estimate our model and capture the lagged value of financial inclusion levels due to the variable's tendency to persist over time. Financial inclusion is measured using the principal component analysis (PCA) to construct a Financial Inclusion Index that accounts for the multidimensionality of the financial system, including access, usage, and quality. Our key findings suggest that trade openness, bank efficiency, income, and remittances are essential macro-level factors that drive the differences in financial inclusion levels between SSA and OECD countries. These results have important implications for SSA policymaking, as addressing these factors could promote greater financial inclusion in the region.

Our empirical contribution to the existing financial inclusion literature is expanding the factors that account for the variations in financial inclusion levels, particularly in SSA and OECD countries. The paper is among the few in the literature on financial inclusion, providing empirical results on the factors that influence financial inclusion from national and international perspectives in a global context. Our focus is to address the disparity in financial inclusion levels between Africa and other developed regions, by identifying the challenges and opportunities that require the attention and action of development actors to promote sustainable economic livelihoods.

The paper is structured as follows: the next section reviews literature on the determinants of financial inclusion, Section 3 describes the data and measurement methods, Section 4 provides the methodology and main estimations employed, Section 5 presents and discusses the main

empirical results, Section 6 presents the robustness test, and finally, Section 7 concludes and offers policy directions and suggestions for future research.

## **2 LITERATURE REVIEW**

According to literature, financial inclusion could be achieved through a various means, including financial education (Khan et al., 2022), the use of technology (Kabir, 2022), and government policies that encourage financial institutions to serve underbanked or unbanked populations. It is also important for promoting economic growth, financial stability, poverty reduction, and sustainable development (Morgan & Pontines, 2018; Omar & Inaba, 2020; Toxopeus & Lensink, 2008; Ugwuanyi et al., 2022). As a result, financial inclusion has become a central focus of economic policymaking.

### **2.1 Concept of Financial Inclusion**

Literature has provided varying definitions to expand the concept of financial inclusion due to its broad nature (Pesqué-Cela et al., 2021; Cámara & Tuesta, 2014; Demirgüç-Kunt & Klapper, 2013; Demirguc-Kunt & Klapper, 2012). Although the concept of financial inclusion is not consistent, it can generally be understood that financial inclusion refers to the idea that all individuals and businesses, irrespective of their income or location have access to affordable financial products and services such as bank accounts, credit, insurance, and investment opportunities that meet their requirements (Demirgüç-Kunt, 2018). The development of this concept has undergone several revisions over the years. Early definitions placed a lot of emphasis on how different demographic groups may access recognised financial services. Recent definitions of financial inclusion now encompass more than just access to formal financial institutions, but extends to include usage, cost, and quality of financial services. In these comprehensive definitions, "access" refers to the availability of financial services, while "use" denotes their actual usage. The "cost" dimension of financial inclusion includes both the financial and non-financial expenses incurred in accessing and utilising financial services, such as bank fees and physical accessibility. The "quality" aspect takes into account the suitability and relevance of financial services and products to meet the needs of individuals and businesses. (Pesqué-Cela et al., 2021).

### **2.2 Determinants of Financial Inclusion**

Over the years, literature has analysed financial inclusion's measurements, determinants, and impacts, which has become increasingly important for many countries worldwide. Researchers in

advanced countries, such as Europe, the United States, and Asia, have employed various dimensions and pointers to explore the causal factors of financial inclusion. In a European-centered study, using 18 countries in Eastern Europe and 5 in Western Europe, Corrado and Corrado (2015) examined the factors that influenced the utilisation of banking and credit services. The study aimed to provide valuable insights into the state of financial inclusion in Europe during financial crises, which can guide policymaking at the local level. The study found that households that experienced adverse changes in employment or income and had no assets to offer as collateral were less likely to have access to financial services, particularly in Eastern Europe. Additionally, some institutional and geographical characteristics affected an individual's participation in a financial system, which may be more closely linked to their location than their identity.

Further, Danisman and Tarazi, (2020) explained that financial inclusion in the European Union (EU) financial system is premised on financial stability. Increasing account ownership by 1% reduces bank default risk by 1.50%. This is especially true for disadvantaged individuals who are young, unemployed, undereducated and live in rural areas. This realisation delivers excessive benefits in the form of human and social capital developments to everyone (Cuéllar & Isabel 2018). However, there is a risk element embedded in interest rate spread that inversely affects financial inclusion due to its deterrence to depositors and investors (Alber, 2019). Increasing income levels in such situations provide a higher explanation power that positively influences financial inclusion.

In an attempt to explain financial inclusion in the Asian region, Le et al., (2019) employed a panel data study using twenty Asian countries over six years. They documented financial inclusion as a key enabler in achieving seven of the seventeen Sustainable Development Goals, including eradicating poverty, eliminating hunger, promoting good health, fostering gender equality, promoting decent work and economic growth, developing industry, innovation and infrastructure, and reducing inequalities. These, through financial inclusion, can achieve stronger economic growth, increased income, higher literacy, and reduced unemployment levels. With all these factors combined, individuals can save and reduce the uncertainty with personal income flow and largely expand financial stability through stable deposits (Fungáčová & Weill 2016). In another dimension, (Eldomiaty et al., 2020) contend that improving financial inclusion globally requires consideration of significant world governance indicators, including control of corruption, government effectiveness, political stability, and voice and accountability.



In the Outlook of Financial Inclusion in the Sub-Saharan region, there is no consensus on the determinants of financial inclusion in literature. Studies have been conducted at both the single-country and regional levels. In an East-African country analysis, Wokabi and Fatoki (2019) explained that the ability of a country to define financial inclusion based on its geographical and socio-economic context allows for the development of an acceptable framework that identifies the factors that drive it. They discovered that rural population and income are the two most essential criteria for financial inclusion in East Africa. Higher GDP per capita countries typically have more comprehensive financial systems, which support increasing levels of financial inclusion. Also, as a country's rural population grows, so do its financial inclusion levels. Similarly, in Southern Africa, income levels were found to be a steady indicator of increased inclusion levels (Mhlanga & Denhere 2020). Mhlanga and Denhere (2020) suggested that financial inclusion is subjective to various demographic factors, including age, educational level, income level, racial background, gender, and marital status.

Central and West Africa have been observed to exhibit the least bank penetration in SSA. In these areas, an individual's ability to access formal finance is heavily influenced by personal characteristics such as gender, education level, age, income, place of residence, employment status, marital status, household size, and trust in financial institutions (Soumaré et al., 2016). Furthermore, Chikalipah (2017) highlighted the effect of illiteracy on financial inclusion in Sub-Saharan Africa. To promote financial inclusion in the region, Chinoda and Kwenda (2019) suggested that it is essential to develop both bank competition and financial stability through monitoring and regulation of competition, as well as a continual evaluation of regulatory structures that promote the availability, accessibility, and utilisation of high-quality formal financial products.

Other empirical studies have examined financial inclusion in areas such as financial stability (Wang & Luo, 2022; Atellu et al., 2021), economic growth (Ifediora et al., 2022; D.-W. Kim et al., 2018), country-level factors (Naumenkova et al., 2019; Baza & Rao, 2017; Fungáčová & Weill, 2016), and technology and innovation (Chung et al., 2023; Kabir, 2022; Senyo & Osabutey, 2020). However, most of these studies excluded many countries and indicators and did not analyse the significant differences in financial inclusion between regions.

### **2.3 Contribution to Existing Studies**

The disparity in financial inclusion levels has been established through literature, with Sub-Saharan Africa being the least inclusive region globally, and East Asia and Europe being more inclusive. Despite efforts to close the gap, there is a need to establish benchmark elements to improve financial inclusion. We add to existing literature by examining new characteristics that have not been studied before and how they can impact policy in Sub-Saharan Africa through a comparative analysis with more advanced regions. We will also consider the different stages of financial development, highlighted by various events, including the post-COVID-19 effect on the financial market.

## **3 DATA**

We used a panel data that covers a 22-year period from 2000 to 2021 to investigate the predictive factors of financial inclusion in 31 Sub-Saharan African (SSA) countries and 38 countries belonging to the Organisation for Economic Co-operation and Development (OECD). The countries included in our study are listed in Appendix AI. This period is intended to capture events such as the introduction of cryptocurrencies in 2009 and a portion of the COVID-19 pandemic, which might have had an impact on the financial market and the services provided within the study period. We employed secondary data from the Global Financial Development and World Development Indicators databases. Tables 1 and 2 list all the data employed in our study.

We use the World Bank's Global Financial Development Database on financial inclusion, as it covers more countries and indicators providing a more comprehensive and nuanced understanding of financial inclusion globally. The World Bank's data includes information on access, usage, depth, and quality/efficiency of financial services and products, collected through surveys of households and firms providing a broader and more relevant picture of financial inclusion globally.

### **3.1 Financial Inclusion Index**

We constructed a Financial Inclusion Index (FII) to account for the several dimensions of financial inclusion in terms of the (i) access to, (ii) usage of and (iii) quality of financial products and services. Specific dimensions are defined with the help of relevant variables (Table 1).

*i. The Access (Geographical penetration of financial services)*

Access explains the penetration of financial products and services to the public, making usage possible. We measure the access dimension ( $A_i$ ) by using two indicators: ATMs per 100,000 adults and bank branches per 100,000 adults, similar to Ugwuanyi et al., (2022) and, Cámara and Tuesta (2014). Although technology in the financial sector, such as mobile money and Internet banking, may provide a contrary measure of access, the role of distance cannot be underestimated in people having the right to assess financial services. Women and the poor are at a higher disadvantage of either not having access to mobile phones or being situated far from a bank branch, and as such might need support to access and utilise a financial account (Demirgüç-Kunt et al., 2022).

*ii. The Usage*

According to Dienillah et al., (2018), financial inclusion requires not just access to financial services but also their active utilization through deposits, credit, payments, transfers, and other transactions. To measure the usage dimension, Cámara and Tuesta (2014) considered the usefulness of financial services in three areas: keeping savings or deposits, contracting a loan, and holding at least one financial product. In line with this perspective, we utilised bank deposits and bank credits as indicators to measure the usage dimension ( $U_i$ ).

*iii. Quality*

Quality explains the financial products and/or services that aim to improve the financial service experience, fulfil financial needs, and ease financial burden. As such, we adopted two measures that reflect the quality dimension ( $Q_i$ ): Life Insurance, defined as life insurance premium volume to a country's GDP, and Non-Life Insurance, defined as the non-life insurance premium volume to a country's GDP.

Following the example of Ugwuanyi et al. (2022) and Nguyen (2021), we used the Principal Component Analysis (PCA) approach as introduced by Cámara and Tuesta (2014) to create a comprehensive index of financial inclusion. According to Cámara and Tuesta (2014), single measures such as bank branches or the number of automatic teller machines (ATMs) provide only a fractional coverage instead of a multidimensional variable. To access the multidimensionality of financial inclusion, many studies have used either the PCA or Sarma (2008) to measure FI. Sarma (2008) created an index similar to the Human Development Index (HDI) but

set its dimensional weights as arbitrary values (1, 0.5, and 0.5 for access, availability, and usage). The use of PCA avoids the problem of weight assignment (e.g. Hodula, 2023) through the use of statistical weights and less arbitrary weights. And it also offers a harmonised and comprehensive measure from a large set of indicators. Additionally, Iwasaki et al., (2022) further elaborated that it helps explore the aggregate impact of factors without omitting any particular indicator and avoids correlation between different individual indicators.

Therefore, by employing the two-stage principal component methodology of Cámara and Tuesta, (2014), for every country  $i$ , we developed FII defined as follows:

$$FII_i = W_1A_i + W_2U_i + W_3Q_i + e_i \dots \dots \dots (1)$$

where,  $A_i, U_i, Q_i$  represents the access, usage and quality dimensions linked to financial services and products;  $W_1, W_2, W_3$  represents the relative weights of each dimension, and  $e_i$  represents errors.

All FII variables are standardized to have a mean of zero and a standard deviation of one, ensuring comparability. Despite that the access, usage and quality dimensions cannot be directly presented as PCA components, the eigenvalues of the first three components explain the majority of variance in the data; details are presented in Appendix Tables A2 and A3. In OECD countries, these components account for 82.4% of total variations, while in SSA countries, they account for 94.0% of total variations in the construction of the financial inclusion index.

### 3.2 Financial inclusion determinants

In the next step, we compile a set of variables representing related determinants of financial inclusion (Table 2). Similar to the example of Ugwuanyi et al., (2022); Mulungula and Nimubona, (2022) and Hajilee and Niroomand, (2019) we employed trade as a measure of trade openness. It measures the sum of the imports and exports expressed as a ratio of GDP. This reflects the level of international trade per country and the flow of funds through a financial system due to trade.

Further, we introduced the z-score as a proxy for bank efficiency. This measures and reflects the extent and ability to which a bank can serve a diverse range of customers, including those unbanked with affordable and accessible financial services and products. For instance, a bank with a high z-score would have a solid financial position and the ability to provide a wide range of financial services at competitive prices to low-income households and small businesses.

We employ personal remittances received as a measure of remittance inflows as it accounts for all transfers and compensations between residents and non-resident individuals and households (Saydaliyev, Chin, & Oskenbayev 2020). Remittances have the potential to promote financial inclusion by increasing demand for the establishment of bank accounts and other forms of savings, as well as the inquiry of bank services by recipients. This demonstrates that remittances may lead to a rise in the use of bank products (Saydaliyev et al., 2020; Anzoategui et al., 2014; Gibson et al., 2010; Giuliano & Ruiz-Arranz, 2009).

Income is captured through Gross Domestic Product (GDP) per capita to understand its impact on accessing financial services. This follows the case point of Tsouli (2022) that higher-income countries tend to have more financial undertakings and better access to financial services.

We further measured literacy rate following Omar and Inaba (2020), and Tsouli (2022), by using secondary school enrollment as a proxy. Secondary education builds upon basic education and promotes development through subject-focused instruction including spending, saving, and investment.

In the literature on determinants of financial inclusion, it has been suggested that other factors could impact access to financial services and products. Therefore, based on the arguments of Tsouli (2022); Fouejieu et al., (2020); Omar and Inaba (2020); Neaime and Gaysset, (2018); Park and Mercado (2015) and Honohan, (2008), we included the following control variables in our analysis: gross capital formation, inflation rate, unemployment rate, and government expenditure.

Tables 3 and 4 show the descriptive statistics of variables for OECD and SSA countries. The Financial Inclusion Index was standardised to a mean of zero and a standard deviation of one for both regions. In addition, trade as a percentage of GDP is significantly higher in OECD economies than in SSA economies. The average trade as a percentage of GDP for OECD economies is 93.45%, whereas, for SSA economies, it is 67.13%. The average GDP per capita among OECD economies is much higher, at US\$32,913.30 than in SSA economies which only amounts to US\$1,882.30. The figure indicates that Africa falls within the lower-middle income category according to the World Bank's range of US\$1,036 to \$4,085. Between 2000 and 2021, SSA experienced an average remittance inflow of 2.58% of GDP, whereas OECD countries had a low average of 0.89%. This highlights the significant role that remittances have played in the development of SSA countries. OECD countries have a mean secondary school enrolment of

89.83%, while SSA has a mean enrolment of only 34.24%. As a result, the literacy level in SSA is below 50%, indicating a significantly low level of literacy in the region.

## 4 METHODOLOGY

### 4.1 Model Specification

To address the limitations of cross-sectional and time-series estimation methods, we used a panel estimation technique which controls for omitted variables and country-specific effects (Stock & Watson, 2001). This technique provides more sample variability, more degree of freedom, and less collinearity among variables (Gujarati & Porter, 2009; Hsiao, 2007). We further formulate an empirical model to assess the factors that influence financial inclusion. The model is specified as a dynamic panel equation similar to Gebregziabher Gebrehiwot and Makina (2019) and Le et al. (2019):

$$FII_{it} = \beta_1 FII_{it-1} + \beta_2 REMIT_{it} + \beta_3 BE_{it} + \beta_4 LIT_{it} + \beta_5 INC_{it} + \beta_6 TO_{it} + \sum_{i=7}^n \beta_i Z_{it} + \nu_i + \epsilon_{it} \dots \dots \dots (2)$$

where *FII* represents Financial Inclusion Index, *REMIT* represents Remittance inflows, *BE* represents Bank Efficiency, *LIT* represents Literacy Rate, *INC* represents Income, *TO* represents Trade Openness,  $\sum Z$  represents a vector of control variables,  $\nu$  represents the time-invariant country-specific fixed effects, and  $\epsilon$  denotes the remainder of the disturbance in the estimated model. The measure of Financial Inclusion is the index of different disaggregates of dimensions as described above.

### 4.2 Estimation Technique

In line with current literature on financial inclusion, we used the dynamic System Generalized Method of Moments (GMM) panel estimator to estimate the model. As specified in equation (2), the lag of financial inclusion in addition to other several basic factors drives the current level of financial inclusion. Due to the autoregressive nature of financial inclusion, static models become inefficient in estimating such models. The inclusion of the lagged value of the dependent variable in the dynamic model is characterised by endogeneity. This can also occur under a variety of conditions, including: (1) when there is a reverse causality among the independent variables and (2) when there is a reverse causality between the independent and dependent variables.

The fixed-effect model assumes strict exogeneity, whereby the explanatory variables cannot depend on past or future error term values. Therefore, the introduction of lagged financial inclusion values into the model violates this assumption, rendering the fixed-effect model unsuitable (Verbeek, 2008). The random-effect model also assumes that the explanatory variables are not correlated with the error term. Therefore, including the lag value of the dependent variable in the model violates this assumption as well. (Agyei et al., 2020). The use of the Pooled OLS estimator would create an estimation bias due to the positive correlation between the unobserved country-specific effects and the pre-existing financial inclusion level, captured as the lagged value of the financial inclusion index (Abeka et al., 2021).

To address the issue, the system GMM estimation technique was introduced by Arellano and Bond (1991) and Blundell and Bond (1998). This approach involves integrating the equations in level form with those in first-differenced form and using the lagged value differences of the independent variables as supplementary instruments in estimating the system of equations in level form. Additionally, it addresses the issue of reverse causality between the regressor and regressands by separating the exogenous components from the endogenous variables or variables that are affected by simultaneity bias to avoid spurious estimation.

Due to the dependent variable's tendency to persist over time, Agyei et al., (2020) recommended that the correlation coefficient between the response variable and its lagged value should be at least 0.8000. This justifies the appropriateness of the dynamic model (two-step GMM) rather than a static one. Arellano and Bond (1991) suggested that the time-series dimension (T) of panel data should be smaller than the cross-sectional dimension to prevent instrument proliferation. In this study, the panel data for SSA countries have  $T = 22$  and  $N = 31$ , while for OECD countries,  $T = 22$  and  $N = 38$ .

The SGMM (System GMM) technique employs instruments to represent independent variables, and the validity of these instruments is evaluated using the Sargan test of over-identifying restrictions. This test determines whether the (group of) instruments are exogenous and thus, valid. If the null hypothesis is rejected, it suggests that the exclusion restrictions for the instruments are not adequate. Furthermore, we conduct an Arellano and Bond Serial correlation analysis to test for autocorrelation on the difference residuals, using the second-order, AR (2), serial correlation. Consistent estimation requires the null hypothesis of uncorrelated disturbance terms to be rejected.

We used pairwise correlation to measure the direction and strength of the association between variables, but this does not necessarily imply causality. We also checked for multicollinearity among the independent variables by examining the correlation coefficient magnitudes. The presence of multicollinearity can weaken the validity of regression estimations. For OECD economies, the financial inclusion index shows a positive correlation with its lagged value, with a correlation coefficient of 0.981. Likewise, in SSA, the financial inclusion index exhibits a correlation coefficient of 0.983 with its lagged value. The magnitude of these relationships indicates a high level of financial inclusion persistence and justifies using System GMM. Based on the results presented in Table 6, there are no significant concerns for multicollinearity in the model specification. This is indicated by the absence of correlation coefficients greater than 0.90 among the regressors (Adam, 2015; Kennedy, 2008).

### **4.3 Diagnostics Test of the Models**

In the testing of the instruments' validity, both the Sargan/Hansen tests are insignificant ( $p > 0.1$ ). This indicates a non-rejection of the null hypothesis of exogeneity for the set of instruments, meaning that the instruments used in Table 7 are valid. Also, we failed to reject the null hypothesis of no autocorrelation at a significance level, as the p-values of AR2 are all greater than 10% ( $p > 0.1$ ). The absence of instrument proliferation and autocorrelation suggests that the findings presented in Section 5 are reliable and conclusive.

## **5 RESULTS AND DISCUSSION**

### **5.1 Determinants of financial inclusion in SSA**

Table 7 presents the results of the main explanatory variables, Literacy rate (SEC-SCH), Trade Openness (TRADE), Bank Efficiency (Z-SCORE), Personal Remittance (P-REMIT), and Income (GDP per capita), for both SSA and OECD economies.

We examined the impact of literacy rate on financial inclusion in SSA. Our analysis revealed a significant positive effect of literacy rate on financial inclusion, indicating that an effective education system is essential for promoting higher levels of financial inclusion in SSA. This is because literacy affects people's financial behaviours, leading to improved savings rates, deposit accumulation, usage of financial products, and investments. This tends to support the findings of Akudugu (2013), Chikalipah (2017), and Ulwodi and Muriu (2017). Empirical



evidence suggests that illiteracy significantly explains poor financial inclusion in the region. (Ray, Morgan, & Thakur 2022).

Trade Openness was found to have a significant but negative effect on financial inclusion. Negative financial inclusion levels are linked with countries that largely rely on imports of goods; this does not attract external financing (Do & Levchenko, 2007). To address this negative effect, Fu et al., (2020) suggest implementing a high level of trade openness while exerting some restrictions on cross-border capital flows. Trade openness attracts foreign competitors to the domestic market. The prevalence of trade competition decreases earnings and internal cash flow, forcing corporations or businesses to rely on domestic banks' financing, capital markets or external funding (Fu et al. 2020; Rajan & Zingales 2003). At the same time, capital restrictions will increase the need to invest more in the financial system.

The regression results in Table 7 reveal that bank efficiency has a significant negative effect on financial inclusion in SSA. This finding can be attributed, in part, to the inefficiencies present in the financial market and system in SSA countries, which have affected the ability of their banking systems to absorb shocks and minimize barriers related to the affordability of formal financial services. This result is consistent with the findings of Cámara & Tuesta (2014) who found a negative significant association between banking system efficiency and their financial inclusion index. It is, therefore, essential for the banking sector of SSA countries to operate with efficiency and without political influences. Additionally, it is crucial to maximise all available resources to ensure that financial services are accessible to all (Agarwala et al., 2023).

Next, we checked the effect of remittances on the level of financial inclusion in SSA and found it to have a counter-effect on financial inclusion. But this is not a relevant factor at conventional levels. Remittances are usually the first financial service migrants provide to their families and friends. Nonetheless, very few people utilize bank accounts for remittance transfers and instead opt for hand-carried cash (Ardıç et al., 2022). Additionally, it is common in SSA for remittances to be transmitted through travellers or unregulated alternatives due to lower foreign exchange conversion costs.

Our results also comment on the impact of income measured by GDP per capita on financial inclusion in SSA economies. However, we found no statistically significant association between the two variables. This finding could be intuitive given that the average income earned in SSA may not accurately reflect the income of the majority of the population due to high inequality.

A large share of the income is held by a smaller group. Large proportions of the countries' income are generated by the informal sector. However, financial inclusion in these countries is often limited to formal financial institutions and services, which may not be accessible or relevant to individuals and households engaged in informal economic activities.

## **5.2 Determinants of financial inclusion in OECD Economies**

Having affirmed a substantial positive connection between literacy and financial inclusion in SSA economies, we further document similarities in the influence of literacy on financial inclusion in OECD. From the results exhibited in Table 7, it can be noted that the influence of literacy rate on financial inclusion in OECD countries is statistically and economically positive at a significant level. This interesting similarity follows the underlying whys and wherefores as emphasised for SSA countries. Empirical evidence from studies conducted in advanced countries stipulates that financial literacy provides sufficient knowledge to compare financial products, make financial decisions and better access financial services and benefits (Gill & Bhattacharya, 2017; Grohmann et al., 2018; Ray et al., 2022). As such, a rise in literacy rate drives up demand for formal and informal financial products, improving financial inclusion (Khan, Siddiqui, & Imtiaz, 2022; Ray et al., 2022).

Trade Openness is found to have a significant positive effect on financial inclusion in OECD countries at conventional levels. This result could partly be explained by the point that trade attracts foreign investment and external financing (Do & Levchenko, 2007), which leads to the development of new financial products and services, and promote financial inclusion. Likewise, trade openness increases competition among financial services providers, which can lead to lower prices and greater access to financial services for consumers (Braun & Raddatz, 2008). This result supports the findings of Kim et al., (2010) and Rajan and Zingales (2003) that suggested a positive effect of trade openness on financial inclusion.

Furthermore, the results in Table 7 confirm a positive effect of income levels on financial inclusion in OECD countries at a statistically significant level. This suggests that higher-income countries are more likely to achieve greater financial inclusion. This result is in line with Gebregziabher Gebrehiwot and Makina, (2019) who reported a linear relationship between income levels and financial inclusion, using GDP per capita as a measure of income. With increased income, individuals have more opportunities to save, invest, buy insurance, transfer money, and use other formal financial services (Le et al., 2019)

Regarding remittance inflows in OECD countries, we found a negative but significant influence of remittances on financial inclusion levels. This finding may be attributed to the increasing adoption of various remittance channels. This proliferation has resulted in a new form of financial exclusion, specifically for less digital literature users as well as those without formal documentation. Thus, undocumented migrants on the sending side and financially excluded families on the receiving side (Ardıç et al., 2022). This finding is consistent with (Bangake et al., 2021). Steady remittance inflows can offer recipient households an alternative financing source, potentially at the expense of the formal financial market, mainly represented by banking institutions (Bangake et al., 2021; Brown et al., 2013). Kokorović Jukan et al., (2020) posited that in South-East Europe, the majority of transfers paid out of cash deter saving excess remittances.

Also, we obtained estimation results showing an insignificant effect of banks' efficiency on financial inclusion in OECD countries. This outcome is not surprising, as once a certain level of efficiency is attained, achieving further improvements becomes considerably difficult, considering the existing level of technology, among other factors. This may well be evident in OECD countries. Moreover, the level of financial inclusion in OECD countries is already high. Hence, marginal efficiency improvements are likely to result in minimal impacts on the already high level of financial inclusion, as evidenced by the insignificant coefficient.

### **5.3 Control Variables**

In line with extant literature, we control for gross capital formation (GCF), inflation rate (CPI), government expenditure (GE) and unemployment rate (UER). In SSA economies, Gross capital formation showed a positive significant effect on financial inclusion. This positive effect is evident in the progressive investment in infrastructure that has helped connect previously underserved areas and make it easier for financial service providers to reach new customers. Further, we note that inflation has a positive significant effect on financial inclusion. This direct relationship is because inflation encourages individuals to invest in long-term assets to curb the negative effect on the real value of money. Alternatively, investors invest in financial assets of lower inflationary countries, which necessitates utilizing financial services and products. However, government expenditure has an insignificant effect on financial inclusion. Likewise, the effect of unemployment on financial inclusion is positive but insignificant.

With regard to the control indicators for OECD economies, we found a comparable positive effect of inflation as established in SSA economies. In our opinion, the positive effect of inflation

is not so startling. Although this research does not test threshold effects, this finding suggests that accommodating some level of inflation can be important for promoting financial inclusion. This is in line with the argument of Phillips, (1958), and Shukayev and Ueberfeldt, (2018) who suggest the need to keep moderate levels of inflation to promote full financial stability, and financial development as inflation can be positively related to financial inclusion. The results also reveal a positive significant effect of government expenditure on financial inclusion. This effect is because huge government spending may indicate the implementation of inclusive policies such as regulations to promote customer protection. This also accounts for the monetary subsidies, transfers and tax incentives that the government provides to allow for financial inclusion to be realized (Abeka et al., 2022). Further, we found a positive significant effect of unemployment rate on financial inclusion. This could be because advanced countries, like most OECD economies, have implemented measures and reforms to support the unemployed including supporting their standard of living and welfare through child support schemes, educational and healthcare investments, and progressive taxation, among others (Omar & Inaba 2020). As such these groups can make their contribution to the financial inclusion levels. Furthermore, Gross capital formation showed a positive but insignificant effect on financial inclusion.

## **6 ROBUSTNESS TEST**

Our results in Table 8 present the robustness test of our baseline results. We re-estimated the results using ATM per 100,000 adults (Appendix Figure A4) as a measure of financial inclusion. Thus, instead of assigning a weight of variables, the ATM per 100,000 adults was used to measure the availability dimension of financial inclusion.

The results from the robustness analysis are not materially different from our baseline results. Table 8 shows the estimation results based on our re-estimation. Our results in Table 8 present trade openness as having a positive significant influence on financial inclusion in SSA. We found this result to be in line with the theory of financial intermediation (Allen & Santomero, 1997). This theory holds that increased trade openness and integration into the global economy can lead to increased financial intermediation or the flow of funds from savers to borrowers through financial institutions. From our results, bank efficiency in SSA is significant and has a positive influence on financial inclusion. Next, we checked the impact of remittances on financial inclusion and found it to have a positive effect at a significant level. We further find literacy as having a negative significant influence on financial inclusion levels in SSA. Finally, we examined

the impact of income on financial inclusion and found this factor not to be relevant at conventional levels as confirmed in our baseline estimation.

We also re-estimated our baseline results for OECD economies and reported our findings in Table 8. From our estimation, we found that Trade openness has a negative significant influence on financial inclusion. The results also showed a positive significant influence of banks' efficiency on financial inclusion in OECD. Furthermore, we found that remittance exhibits a positive significant effect on financial inclusion. Next, we found that the influence of income is in line with the baseline results. This suggests that higher income levels in OECD economies are associated with increased access to and use of financial services, such as bank accounts, credit, and insurance. Finally, we examined the impact of literacy on financial inclusion in OECD and found this factor not to be relevant at conventional levels.

Upon completion of our robustness test, the results in Table 8 demonstrate that our baseline results are robust in relation to an alternative variable that was employed as a measure of financial inclusion. This highlights the consistency and dependability of the methodology applied.

## **7 CONCLUSION AND POLICY IMPLICATIONS**

Financial inclusion has been recognised as an important policy tool for the world's development due to its important role in an economy. The World Bank advocated for a "financial inclusion strategy" coupled with relative financial and theoretical investment. This includes exploring essential factors that boost inclusion and make formal financial services accessible. Hence, we examined the determinants of financial inclusion in SSA and OECD economies and analyse their differences and similarities at the macro levels. This was to also help understand the variation in financial inclusion levels between these two regions and how to bridge the financial inclusion gap. To achieve this, we developed a financial inclusion index that reflects the accessibility, usage, and quality of financial products and services. We used the System GMM dynamic panel data estimation to address issues of endogeneity and omitted variables to examine the determinants of financial inclusion across 31 SSA countries and 38 OECD countries. Our results indicate that trade openness, bank efficiency, income, and remittances are key macro-level factors that account for the disparities in financial inclusion levels between SSA and OECD countries. These factors have varying impacts on financial inclusion in the two regions.

Our estimation results indicate that financial inclusion is positively and significantly linked to its past levels. In SSA economies, financial inclusion is positively and significantly associated

with literacy but negatively associated with trade openness and bank efficiency. In contrast, remittances and income do not significantly influence financial inclusion in SSA. However, when comparing our findings to benchmark results in OECD economies, we found that financial inclusion is positively and significantly influenced by literacy, trade openness, and income, but negatively affected by remittances. Banks' efficiency remains an insignificant factor that warrants consideration.

Notably, our findings highlight the significance of literacy in achieving higher levels of financial inclusion in both SSA and OECD countries. Educational policies that promote literacy could play a vital role in bridging the financial inclusion gap. Moreover, the integration of SSA economies has not led to a significant increase in trade, which could contribute to financial inclusion. This suggests that integration alone is not sufficient to promote financial inclusion through trade and ancillary systems. Therefore, additional measures are necessary to address this issue.

It is also conventional to suggest that the World Bank should invest in initiatives that foster trade activities. The key is to implement a high level of trade openness, while exerting some restrictions on cross-border capital flow to encourage greater participation in the financial system. Policymakers should prioritize improving bank efficiency to encourage productive investment, savings, transfers, etc. This can be achieved through information, structural, and regulatory reforms rather than political pressures, which would create an efficient banking system and make the financial market less susceptible to external shocks. It is worth noting that maintaining an effective banking system is vital for sustaining the economy as it ensures the uninterrupted provision of financial services and products (Agarwala et al., 2023). Furthermore, literacy in both regions especially SSA should be streamlined to promote a greater level of financial inclusion. Despite the low literacy rates in this region, it has a positive impact on financial inclusion. Therefore, SSA countries must prioritize financial literacy as part of their educational reforms. This will improve the use of financial information, build an efficient banking system, increase consumer protection, and ultimately facilitate the progress of financial inclusion.

Further research could assess the political and economic institutions that affect financial inclusion in both SSA and OECD economies to provide deeper insights into the determinants of financial inclusion. Additional measures on financial inclusion such as the IMF Financial Development Index could be employed to supplement the analysis.

## References

- Abeka, M. J., Amoah, E. K., Owusu Appiah, M., Gatsi, J. G., Obuobi, N. K., & Boateng, E. (2022). Economic Institutions, Political Institutions and Renewable Energy Production in Africa. *Journal of African Business*, 23(4), 1049–1066. <https://doi.org/10.1080/15228916.2021.1984818>
- Abeka, M. J., Andoh, E., Gatsi, J. G., & Kawor, S. (2021). Financial development and economic growth nexus in SSA economies: The moderating role of telecommunication development. *Cogent Economics & Finance*, 9(1), 1862395. <https://doi.org/10.1080/23322039.2020.1862395>
- Adam, A. M. (2015). *Statistics for business research*. Global Research Publishers.
- Agarwala, N., Maity, S., & Sahu, T. N. (2023). Efficiency of Indian banks in fostering financial inclusion: An emerging economy perspective. *Journal of Financial Services Marketing*. <https://doi.org/10.1057/s41264-022-00203-7>
- Agyei, S. K., Marfo-Yiadom, E., Ansong, A., & Idun, A. A. A. (2020). Corporate Tax Avoidance Incentives of Banks in Ghana. *Journal of African Business*, 21(4), 544–559. <https://doi.org/10.1080/15228916.2019.1695183>
- Akudugu, M. A. (2013). The Determinants of Financial Inclusion in Western Africa: Insights from Ghana. *Research Journal of Finance and Accounting*, 14(8), 1–9.
- Alber, N. (2019). Determinants of Financial Inclusion: The Case of 125 Countries from 2004 to 2017. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3476373>
- Allen, F., & Santomero, A. M. (1997). The theory of financial intermediation. *Journal of Banking & Finance*, 21(11–12), 1461–1485. [https://doi.org/10.1016/S0378-4266\(97\)00032-0](https://doi.org/10.1016/S0378-4266(97)00032-0)
- Anzoategui, D., Demirgüç-Kunt, A., & Martínez Pería, M. S. (2014). Remittances and Financial Inclusion: Evidence from El Salvador. *World Development*, 54, 338–349. <https://doi.org/10.1016/j.worlddev.2013.10.006>
- Ardıç, O. P., Bajjal, H., Baudino, P., Boakye-Adjei, N. Y., Fishman, J., & Maikai, R. A. (2022). *The journey so far: Making cross-border remittances work for financial inclusion*. Bank for International Settlements, Financial Stability Institute.
- Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58(2), 277. <https://doi.org/10.2307/2297968>
- Atellu, A. R., Muriu, P., & Sule, O. (2021). Do bank regulations matter for financial stability? Evidence from a developing economy. *Journal of Financial Regulation and Compliance*, 29(5), 514–532. <https://doi.org/10.1108/JFRC-12-2020-0114>
- Bangake, C., Barnabé, A. Y., & Ningaye, P. (2021). Do remittances spur financial inclusion in Africa? A multi-dimensional approach. *Economics Bulletin*, 41(2), 328–341.
- Barik, R., & Lenka, S. K. (2022). Does financial inclusion control corruption in upper-middle and lower-middle income countries? *Asia-Pacific Journal of Regional Science*. <https://doi.org/10.1007/s41685-022-00269-0>
- Baza, A. U., & Rao, K. S. (2017). Financial Inclusion in Ethiopia. *International Journal of Economics and Finance*, 9(4), 191. <https://doi.org/10.5539/ijef.v9n4p191>
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
- Braun, M., & Raddatz, C. (2008). Trade Liberalization and the Politics of Financial Development. *World Bank Working Paper*, 3517.

- Brown, R. P. C., Carmignani, F., & Fayad, G. (2013). Migrants' Remittances and Financial Development: Macro- and Micro-Level Evidence of a Perverse Relationship: MIGRANTS' REMITTANCES AND FINANCIAL DEVELOPMENT. *The World Economy*, 36(5), 636–660. <https://doi.org/10.1111/twec.12016>
- Cámara, N., & Tuesta, D. (2014). Measuring Financial Inclusion: A Multidimensional Index. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2634616>
- Chibba, M. (2009). Financial Inclusion, Poverty Reduction and the Millennium Development Goals. *The European Journal of Development Research*, 21(2), 213–230. <https://doi.org/10.1057/ejdr.2008.17>
- Chikalipah, S. (2017). What determines financial inclusion in Sub-Saharan Africa? *African Journal of Economic and Management Studies*, 8(1), 8–18. <https://doi.org/10.1108/AJEMS-01-2016-0007>
- Chinoda, T., & Kwenda, F. (2019). Do mobile phones, economic growth, bank competition and stability matter for financial inclusion in Africa? *Cogent Economics & Finance*, 7(1), 1622180. <https://doi.org/10.1080/23322039.2019.1622180>
- Chung, S., Kim, K., Lee, C. H., & Oh, W. (2023). Interdependence between online peer-to-peer lending and cryptocurrency markets and its effects on financial inclusion. *Production and Operations Management*, poms.13950. <https://doi.org/10.1111/poms.13950>
- Corrado, G., & Corrado, L. (2015). The geography of financial inclusion across Europe during the global crisis. *Journal of Economic Geography*, 15(5), 1055–1083. <https://doi.org/10.1093/jeg/lbu054>
- Cuéllar, P., & Isabel, L. (2018). International financial inclusion: Some multidimensional determinants. *Small Business International Review*, 2(2), 1–14. <https://doi.org/10.26784/sbir.v2i2.125>
- Danisman, G. O., & Tarazi, A. (2020). Financial Inclusion and Bank Stability: Evidence from Europe. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3610453>
- Demirgüç-Kunt, A. (2018). *The Global Findex database 2017: Measuring financial inclusion and the fintech revolution*. World Bank.
- Demirguc-Kunt, A., & Klapper, L. (2012). *Measuring Financial Inclusion: The Global Findex Database*. The World Bank. <https://doi.org/10.1596/1813-9450-6025>
- Demirgüç-Kunt, A., & Klapper, L. (2013). Measuring Financial Inclusion: Explaining Variation in Use of Financial Services across and within Countries. *Brookings Papers on Economic Activity*, 2013(1), 279–340. <https://doi.org/10.1353/eca.2013.0002>
- Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2022). *The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19*. The World Bank. <https://doi.org/10.1596/978-1-4648-1897-4>
- Dienillah, A. A., Anggraeni, L., & Sahara, S. (2018). Impact of Financial Inclusion on Financial Stability based on Income Group Countries. *Buletin Ekonomi Moneter Dan Perbankan*, 20(4), 397–410. <https://doi.org/10.21098/bemp.v20i4.859>
- Do, Q.-T., & Levchenko, A. A. (2007). Comparative advantage, demand for external finance, and financial development. *Journal of Financial Economics*, 86(3), 796–834. <https://doi.org/10.1016/j.jfineco.2006.11.004>
- Eldomiaty, T., Hammam, R., & El Bakry, R. (2020). Institutional determinants of financial inclusion: Evidence from world economies. *International Journal of Development Issues*, 19(2), 217–228. <https://doi.org/10.1108/IJDI-08-2019-0147>



- Fouejieu, A., Sahay, R., Cihak, M., & Chen, S. (2020). Financial inclusion and inequality: A cross-country analysis. *The Journal of International Trade & Economic Development*, 29(8), 1018–1048. <https://doi.org/10.1080/09638199.2020.1785532>
- Fu, J., Liu, Y., Chen, R., Yu, X., & Tang, W. (2020). Trade openness, internet finance development and banking sector development in China. *Economic Modelling*, 91, 670–678. <https://doi.org/10.1016/j.econmod.2019.12.008>
- Fungáčová, Z., & Weill, L. (2016). Determinants of Financial Inclusion in Asia. In S. Gopalan & T. Kikuchi (Eds.), *Financial Inclusion in Asia* (pp. 35–57). Palgrave Macmillan UK. [https://doi.org/10.1057/978-1-137-58337-6\\_2](https://doi.org/10.1057/978-1-137-58337-6_2)
- Gebregziabher Gebrehiwot, K., & Makina, D. (2019). Macroeconomic Determinants of Financial Inclusion. In *Extending Financial Inclusion in Africa* (pp. 167–191). Elsevier. <https://doi.org/10.1016/B978-0-12-814164-9.00008-6>
- Gibson, J., Boe-Gibson, G., Rohorua, H., & McKenzie, D. (2010). Efficient remittance services for development in the Pacific. *Asia-Pacific Development Journal*, 14(2), 55–74. <https://doi.org/10.18356/245c03fa-en>
- Gill, A., & Bhattacharya, R. (2017). The Interaction of Financial Attitudes and Financial Knowledge: Evidence for Low-Income Hispanic Families. *Atlantic Economic Journal*, 45(4), 497–510. <https://doi.org/10.1007/s11293-017-9556-4>
- Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics*, 90(1), 144–152. <https://doi.org/10.1016/j.jdeveco.2008.10.005>
- Grohmann, A., Klühs, T., & Menkhoff, L. (2018). Does financial literacy improve financial inclusion? Cross country evidence. *World Development*, 111, 84–96. <https://doi.org/10.1016/j.worlddev.2018.06.020>
- Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed). McGraw-Hill Irwin.
- Hajilee, M., & Niroomand, F. (2019). On the link between financial market inclusion and trade openness: An asymmetric analysis. *Economic Analysis and Policy*, 62, 373–381. <https://doi.org/10.1016/j.eap.2018.10.001>
- Hodula, M. (2023). Fintech credit, big tech credit and income inequality. *Finance Research Letters*, 51, 103387. <https://doi.org/10.1016/j.frl.2022.103387>
- Honohan, P. (2008). Cross-country variation in household access to financial services. *Journal of Banking & Finance*, 32(11), 2493–2500. <https://doi.org/10.1016/j.jbankfin.2008.05.004>
- Hsiao, C. (2007). Panel data analysis—Advantages and challenges. *TEST*, 16(1), 1–22. <https://doi.org/10.1007/s11749-007-0046-x>
- Ifediora, C., Offor, K. O., Eze, E. F., Takon, S. M., Ageme, A. E., Ibe, G. I., & Onwumere, J. U. J. (2022). Financial inclusion and its impact on economic growth: Empirical evidence from sub-Saharan Africa. *Cogent Economics & Finance*, 10(1), 2060551. <https://doi.org/10.1080/23322039.2022.2060551>
- Iwasaki, I., Kočenda, E., & Shida, Y. (2022). Institutions, financial development, and small business survival: Evidence from European emerging markets. *Small Business Economics*, 58(3), 1261–1283. <https://doi.org/10.1007/s11187-021-00470-z>
- Kabir, Md. H. (2022). Financial Innovation: Accelerating Financial Inclusion in South Asia: In I. R. Management Association (Ed.), *Research Anthology on Business Continuity and Navigating Times of Crisis* (pp. 1556–1581). IGI Global. <https://doi.org/10.4018/978-1-6684-4503-7.ch075>
- Kennedy, P. (2008). *A guide to econometrics* (6th ed). Blackwell Pub.

- Khan, F., Siddiqui, M. A., & Imtiaz, S. (2022). Role of financial literacy in achieving financial inclusion: A review, synthesis and research agenda. *Cogent Business & Management*, 9(1), 2034236. <https://doi.org/10.1080/23311975.2022.2034236>
- Kim, D.-H., Lin, S.-C., & Suen, Y.-B. (2010). Dynamic effects of trade openness on financial development. *Economic Modelling*, 27(1), 254–261. <https://doi.org/10.1016/j.econmod.2009.09.005>
- Kim, D.-W., Yu, J.-S., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance*, 43, 1–14. <https://doi.org/10.1016/j.ribaf.2017.07.178>
- Kokorović Jukan, M., Okičić, J., & Hopić, D. (2020). Remittances as an opportunity to increase savings and financial inclusion of youth in South East Europe. *Economic Research-Ekonomska Istraživanja*, 33(1), 2606–2619. <https://doi.org/10.1080/1331677X.2020.1749104>
- Le, T. T., Dang, N. D. L., Nguyen, T. D. T., Vu, T. S., & Tran, M. D. (2019). Determinants of Financial Inclusion: Comparative Study of Asian Countries. *Asian Economic and Financial Review*, 9(10), 1107–1123. <https://doi.org/10.18488/journal.aefr.2019.910.1107.1123>
- Mhlanga, D., & Denhere, V. (2020). Determinants of Financial Inclusion in Southern Africa. *Studia Universitatis Babeş-Bolyai Oeconomica*, 65(3), 39–52. <https://doi.org/10.2478/subboec-2020-0014>
- Morgan, P. J., & Pontines, V. (2018). FINANCIAL STABILITY AND FINANCIAL INCLUSION: THE CASE OF SME LENDING. *The Singapore Economic Review*, 63(01), 111–124. <https://doi.org/10.1142/S0217590818410035>
- Mulungula, A. M., & Nimubona, F. (2022). Digital Financial Inclusion and Trade Openness in Africa. *Open Journal of Business and Management*, 10(02), 744–777. <https://doi.org/10.4236/ojbm.2022.102042>
- Naumenkova, S., Mishchenko, S., & Dorofeiev, D. (2019). Digital financial inclusion: Evidence from Ukraine. *Investment Management and Financial Innovations*, 16(3), 194–205. [https://doi.org/10.21511/imfi.16\(3\).2019.18](https://doi.org/10.21511/imfi.16(3).2019.18)
- Neaime, S., & Gaysset, I. (2018). Financial inclusion and stability in MENA: Evidence from poverty and inequality. *Finance Research Letters*, 24, 230–237. <https://doi.org/10.1016/j.frl.2017.09.007>
- Nguyen, T. T. H. (2021). Measuring financial inclusion: A composite FI index for the developing countries. *Journal of Economics and Development*, 23(1), 77–99. <https://doi.org/10.1108/JED-03-2020-0027>
- Ohiomu, S., & Ogbeide-Osaretin, E. N. (2019). Financial Inclusion and Gender Inequality Reduction: Evidence from Sub-Saharan Africa. *The Indian Economic Journal*, 67(3–4), 367–372. <https://doi.org/10.1177/0019466220946411>
- Omar, M. A., & Inaba, K. (2020). Does financial inclusion reduce poverty and income inequality in developing countries? A panel data analysis. *Journal of Economic Structures*, 9(1), 37. <https://doi.org/10.1186/s40008-020-00214-4>
- Park, C.-Y., & Mercado, R. J. (2015). Financial Inclusion, Poverty, and Income Inequality in Developing Asia. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2558936>
- Pesqué-Cela, V., Tian, L., Luo, D., Tobin, D., & Kling, G. (2021). Defining and measuring financial inclusion: A systematic review and confirmatory factor analysis. *Journal of International Development*, 33(2), 316–341. <https://doi.org/10.1002/jid.3524>

- Phillips, A. W. (1958). The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957. *Economica*, 25(100), 283. <https://doi.org/10.2307/2550759>
- Rajan, R. G., & Zingales, L. (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics*, 69(1), 5–50. [https://doi.org/10.1016/S0304-405X\(03\)00125-9](https://doi.org/10.1016/S0304-405X(03)00125-9)
- Ray, S., Morgan, P., & Thakur, V. (2022). *Digital Financial Inclusion and Literacy from a G20 Perspective*. Asian Development Bank Institute. <https://doi.org/10.56506/UXOQ1249>
- Saydaliyev, H. B., Chin, L., & Oskenbayev, Y. (2020). The nexus of remittances, institutional quality, and financial inclusion. *Economic Research-Ekonomska Istraživanja*, 33(1), 3528–3544. <https://doi.org/10.1080/1331677X.2020.1774795>
- Senyo, P., & Osabutey, E. L. C. (2020). Unearthing antecedents to financial inclusion through FinTech innovations. *Technovation*, 98, 102155. <https://doi.org/10.1016/j.technovation.2020.102155>
- Sethi, D., & Acharya, D. (2018). Financial inclusion and economic growth linkage: Some cross country evidence. *Journal of Financial Economic Policy*, 10(3), 369–385. <https://doi.org/10.1108/JFEP-11-2016-0073>
- Shukayev, M., & Ueberfeldt, A. (2018). Monetary policy tradeoffs between financial stability and price stability. *Canadian Journal of Economics/Revue Canadienne d'économique*, 51(3), 901–945. <https://doi.org/10.1111/caje.12340>
- Soumaré, I., Tchana Tchana, F., & Kengne, T. M. (2016). Analysis of the determinants of financial inclusion in Central and West Africa. *Transnational Corporations Review*, 8(4), 231–249. <https://doi.org/10.1080/19186444.2016.1265763>
- Stock, J. H., & Watson, M. W. (2001). Vector Autoregressions. *Journal of Economic Perspectives*, 15(4), 101–115. <https://doi.org/10.1257/jep.15.4.101>
- Toxopeus, H. S., & Lensink, R. (2008). Remittances and Financial Inclusion in Development. In T. Addison & G. Mavrotas (Eds.), *Development Finance in the Global Economy* (pp. 236–263). Palgrave Macmillan UK. [https://doi.org/10.1057/9780230594074\\_10](https://doi.org/10.1057/9780230594074_10)
- Tsouli, D. (2022). Financial Inclusion, Poverty, and Income Inequality: Evidence from European Countries. *Ekonomika*, 101(1), 37–61. <https://doi.org/10.15388/Ekon.2022.101.1.3>
- Ugwuanyi, U., Ugwuoke, R., Onyeonu, E., Festus Eze, E., Isahaku Prince, A., Anago, J., & Ibe, G. I. (2022). Financial inclusion - economic growth nexus: Traditional finance versus digital finance in Sub-Saharan Africa. *Cogent Economics & Finance*, 10(1), 2133356. <https://doi.org/10.1080/23322039.2022.2133356>
- Ulwodi, D. W., & Muriu, P. W. (2017). Barriers of Financial Inclusion in Sub-Saharan Africa. *Journal of Economics and Sustainable Development*, 8(14).
- Verbeek, M. (2008). *A guide to modern econometrics* (3rd ed). John Wiley & Sons.
- Wang, R., & Luo, H. (Robin). (2022). How does financial inclusion affect bank stability in emerging economies? *Emerging Markets Review*, 51, 100876. <https://doi.org/10.1016/j.ememar.2021.100876>
- Wokabi, V. W., & Fatoki, O. I. (2019). DETERMINANTS OF FINANCIAL INCLUSION IN EAST AFRICA. *International Journal of Business and Management*, VII(1). <https://doi.org/10.20472/BM.2019.7.1.009>
- Xu, Q., & Sun, W. (2022). Does financial inclusion promote investment and affect residents' happiness?—Evidence from China. *Frontiers in Psychology*, 13, 988312. <https://doi.org/10.3389/fpsyg.2022.988312>

## TABLE AND FIGURES

**Table 1: Component variables of the Financial Inclusion Index**

Components	Individual indicator(s)	Source of Data
ATM per 100,000 adults	Number of ATMs per 100,000 adults.	Global Financial Development, 2000-2021
Bank Branches per 100,000 adults	Number of commercial bank branches per 100,000 adults.	Global Financial Development, 2000-2021
Bank Deposits	Money deposited in banks as a share of GDP.	Global Financial Development, 2000-2021
Bank Credit to Bank Deposit	Credit provided by domestic money banks as a share of total deposits.	Global Financial Development, 2000-2021
Life Insurance Premium	Ratio of life insurance premium volume to GDP.	Global Financial Development, 2000-2021
Non-Life Insurance Premium	Ratio of nonlife insurance premium volume to GDP	Global Financial Development, 2000-2021

**Table 2: Variable and Measurement**

Variable	Measurement	Data Source
Financial Inclusion Index	Principal Component Analysis of five (5) variable estimates measuring access, usage and quality of product	See, Table 1
Trade Openness	Sum of exports and imports of goods and services as a share of gross domestic product.	World Development Indicators 2000 - 2021
Banks' Efficiency	Bank Z-score	Global Financial Development, 2000-2021
Remittances	Personal remittances received (% of GDP)	World Development Indicators 2000 - 2021
Income	Gross Domestic Product (GDP) per capita	World Development Indicators 2000 - 2021
Literacy Rate	School enrollment, secondary	World Development Indicators 2000 - 2021
Inflation	Consumer Price Index	World Development Indicators 2000 - 2021
Government Expenditure	Annual percentage growth of general government final consumption expenditure	World Development Indicators 2000 - 2021
Unemployment rate	Unemployment, total (% of total labour force)	World Development Indicators 2000 - 2021
Gross Capital Formation	Gross capital formation (% of GDP)	World Development Indicators 2000 - 2021

**Table 3: Descriptive Statistics – OECD Countries**

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Financial Inclusion Index (FII)	575	0	1.00	-1.87	4.19
Trade Openness	836	93.45	54.91	19.56	388.12
Banks' Efficiency	803	15.80	9.71	-0.33	57.441
Remittance	835	0.89	1.03	0	6.01
Literacy	552	89.83	6.88	56.09	99.91
Income	836	33755.11	23059.84	2305.08	134000
Inflation	836	2.792	3.92	-4.48	54.91
Gross Capital Formation (GCF)	836	23.43	4.42	11.89	54.96
Government Expenditure (GE)	836	2.24	2.51	-10.06	12.63
Unemployment rate	836	55.973	6.38	37.737	76.85

*Source: Authors' estimates*

**Table 4: Descriptive Statistics – SSA Countries**

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Financial Inclusion Index (FII)	366	0	1.00	-1.339	3.902
Trade Openness	680	67.13	28.468	16.352	175.798
Banks' Efficiency	565	14.476	5.444	2.731	32.07
Remittance	639	2.581	3.387	0	26.837
Literacy	207	34.238	19.879	3.28	90.544
Income	682	1920.16	2248.06	114.37	11645.98
Inflation	652	8.398	28.974	-8.975	513.907
Gross Capital Formation (GCF)	673	22.775	9.215	1.097	79.401
Government Expenditure (GE)	633	7.228	28.446	-55.348	565.539
Unemployment rate	682	7.93	7.67	0.32	33.56

*Source: Authors' estimates*

**Table 5: Pairwise correlations – OECD Economies**

Variables	Financial Inclusion Index (FII)	Trade	Banks' Efficiency	Remittance	Literacy	Income	Inflation	Gross Capital Formation (GCF)	Government Expenditure (GE)	Unemployment
Financial Inclusion Index (FII)	1.000									
Trade Openness	-0.271***	1.000								
Banks' Efficiency	-0.158***	0.216***	1.000							
Remittance	-0.158***	0.472***	-0.097***	1.000						
Literacy rate	0.089*	0.054	0.001	-0.185***	1.000					
Income	-0.025	0.260***	0.314***	-0.213***	0.161***	1.000				
Inflation	0.171***	-0.088**	-0.159***	0.100***	-0.376***	-0.200***	1.000			
Gross Capital Formation (GCF)	0.067	0.045	-0.091***	-0.054	0.018	-0.067	0.120***	1.000		
Government Expenditure (GE)	-0.032	0.008	0.054	-0.048	-0.171***	-0.035	0.140***	0.361***	1.000	
Unemployment	0.093**	-0.110***	-0.224***	0.194***	-0.044	-0.378***	0.159***	-0.080**	-0.011	1.000

\*significance at 10% level; \*\*significance at 5% level; \*\*\*significance at 1% level.

Source: Authors' estimates

**Table 6: Pairwise correlations – SSA Economies**

Variables	Financial Inclusion Index (FII)	Trade	Banks' Efficiency	Remittance	Literacy	Income	Inflation	Gross Capital Formation (GCF)	Government Expenditure (GE)	Unemployment
Financial Inclusion Index (FII)	1.000									
Trade Openness	0.313***	1.000								
Banks' Efficiency	0.335***	0.099**	1.000							
Remittance	-0.058	-0.007	0.092**	1.000						
Literacy rate	0.676***	0.401***	0.425***	0.337***	1.000					
Income	0.619***	0.470***	0.170***	-0.219***	0.639***	1.000				
Inflation	-0.083	0.021	-0.044	-0.150***	-0.069	-0.038	1.000			
Gross Capital Formation (GCF)	0.037	0.407***	-0.041	0.111***	-0.033	0.083**	-0.043	1.000		
Government Expenditure (GE)	-0.091*	-0.040	-0.030	-0.015	-0.043	-0.037	-0.034	-0.013	1.000	
Unemployment	0.641***	0.473***	0.249***	-0.068*	0.513***	0.653***	-0.039	0.056	-0.052	1.000

*\*significance at 10% level; \*\*significance at 5% level; \*\*\*significance at 1% level*

*Source: Authors' estimates*

**Table 7: Results of the determinants of financial inclusion in SSA countries and OECD countries**

	<b>SSA</b>	<b>OECD</b>
Lag of Financial Inclusion Index (L.FII)	0.8166*** (0.000)	1.027*** (0.000)
Literacy Rate	0.01014*** (0.000)	0.00732** (0.033)
Trade Openness	-0.00178** (0.017)	0.00076** (0.011)
Banks' Efficiency	-0.0147*** (0.003)	-0.00056 (0.630)
Remittance	-0.00208 (0.698)	-0.06062*** (0.000)
Income	0.0000578 (0.670)	0.00000106* (0.091)
<b>Controls</b>		
Government Expenditure (GE)	0.00063 (0.389)	0.03698*** (0.000)
Gross Capital Formation (GCF)	0.01044*** (0.000)	0.00105 (0.771)
Inflation	0.00866*** (0.000)	0.02429*** (0.000)
Unemployment	0.00022 (0.975)	0.01010*** (0.000)
Constant	-0.3755*** (0.003)	-0.95757*** (0.002)
<b>Diagnostics</b>		
Wald Test	124701.28	10388.22
Prob. (Wald)	0.000	0.000
AR1 (p-value)	0.230	0.003
AR2 (p-value)	0.309	0.642
Hansen-J (p-value)	0.696	0.135
Sargan (p-value)	0.644	0.208
Observations	110	383

*Statistical significance at the 1%, 5%, and 10% level is indicated by \*\*\*, \*\*, and \*, respectively*

*Source: Authors' estimates*



**Table 8: Robustness test**

	<b>SSA</b>	<b>OECD</b>
L.ATMs	1.04663*** (0.000)	0.91184*** (0.000)
Literacy Rate	-0.27861*** (0.001)	0.07342 (0.462)
Trade Openness	0.21456*** (0.000)	-0.05476*** (0.000)
Banks' Efficiency	0.56658*** (0.001)	0.14716** (0.044)
Remittance	0.65407* (0.098)	1.21089** (0.035)
Income	-0.00095 (0.136)	0.00027*** (0.000)
<b>Controls</b>		
Government Expenditure (GE)	-0.18338** (0.016)	-0.34679** (0.021)
Gross Capital Formation (GCF)	-0.35495*** (0.008)	0.60228*** (0.000)
Inflation	-0.22106*** (0.000)	-0.20794** (0.012)
Unemployment	-0.32505** (0.011)	0.57799*** (0.000)
Constant	-1.02621 (0.747)	-21.16948** (0.037)
<b>Diagnostics</b>		
Wald Test	108267.84	59109.41
Prob. (Wald)	0.000	0.000
AR1 (p-value)	0.065	0.075
AR2 (p-value)	0.194	0.179
Hansen-J (p-value)	0.739	0.329
Sargan (p-value)	0.462	0.130
Observations	110	383

*Statistical significance at the 1%, 5%, and 10% level is indicated by \*\*\*, \*\*, and \*, respectively*

*Source: Authors' estimates*

## APPENDIX

**Table A1: List of the sample of 31 SSA economies and 38 OECD economies**

<b>SUB-SAHARAN AFRICA COUNTRIES</b>		<b>OECD COUNTRIES</b>	
<b>Eastern Africa</b>	<b>Western Africa</b>	<b>Asia</b>	Poland
Burundi	Benin	Israel	Portugal
Kenya	Burkina Faso	Japan	Slovak Republic
Madagascar	Cape Verde	Korea Republic	Slovenia
Mauritius	Cote d'Ivoire		Spain
Mozambique	The Gambia	<b>Europe</b>	Sweden
Rwanda	Ghana	Austria	Switzerland
Tanzania	Guinea	Belgium	Turkey
Uganda	Mali	Czech Republic	United Kingdom
	Niger	Denmark	
<b>Middle Africa</b>	Nigeria	Estonia	<b>North America</b>
Angola	Senegal	Finland	Canada
Cameroon	Sierra Leone	France	Costa Rica
Chad	Togo	Germany	Mexico
Congo		Greece	United States of America
Congo Republic		Hungary	
Gabon		Iceland	<b>Oceania</b>
		Ireland	Australia
<b>Southern Africa</b>		Italy	New Zealand
Botswana		Latvia	
Eswatini		Lithuania	<b>South America</b>
Namibia		Luxembourg	Chile
South Africa		Netherlands	Colombia
		Norway	

**Table A2 - Estimation results of the principal component analysis – Financial Inclusion Index of OECD**

	Coefficient	Std.Error.	z	P-value	Eigenvalue of the correlation matrix	
<b>Eigenvalues</b>						
Component 1	2.287	0.134	17.040	0.000		
<b>Eigenvectors of the first component</b>					<b>Component no.</b>	<b>Cumulative percentage of total variance</b>
ATMs	0.575	0.029	19.730	0.000	1	0.381
BBA	0.535	0.038	13.910	0.000	2	0.641
Bank credit to Bank deposit	0.157	0.068	2.330	0.020	3	0.824
Bank Deposit	0.188	0.073	2.580	0.010	4	0.912
Life Insurance	0.438	0.040	11.000	0.000	5	0.987
Non-life Insurance	0.363	0.049	7.420	0.000	6	1.000

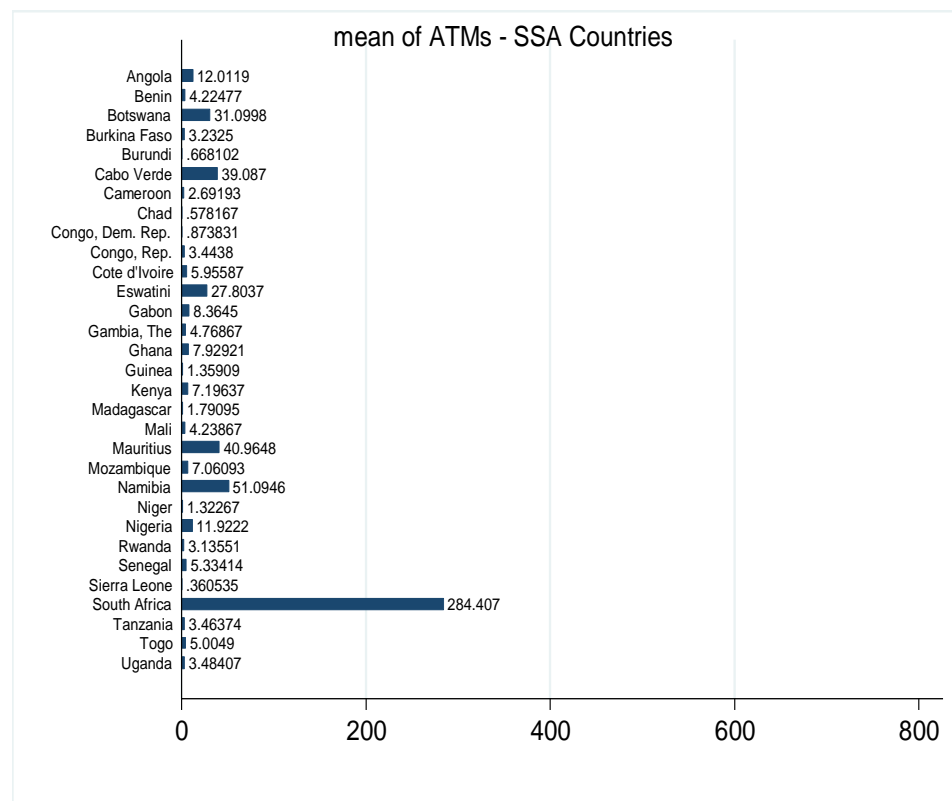
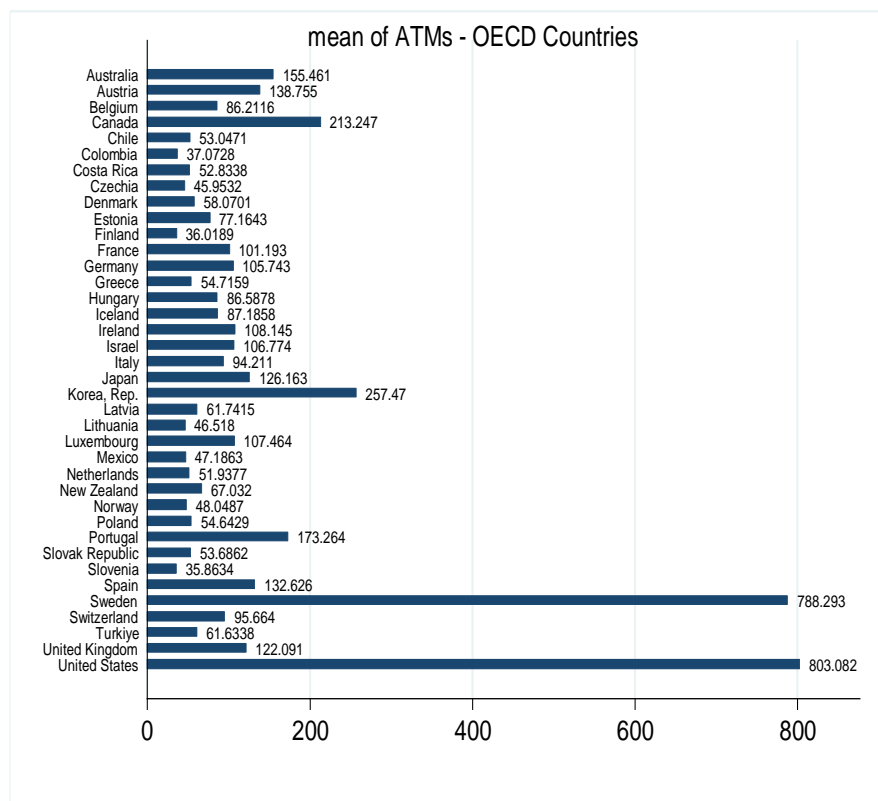
*Source: Authors' estimates*

**Table A3 - Estimation results of the Principal component analysis – Financial Inclusion Index of SSA**

	Coefficient	Std.Error.	z	P-value	Eigenvalue of the correlation matrix	
<b>Eigenvalues</b>						
Component 1	4.176	0.309	13.530	0.000		
<b>Eigenvectors of the first component</b>					<b>Component no.</b>	<b>Cumulative percentage of total variance</b>
ATMs	0.440	0.013	34.050	0.000	1	0.696
BBA	0.459	0.010	47.740	0.000	2	0.838
Bank credit to Bank deposit	0.262	0.027	9.840	0.000	3	0.940
Bank Deposit	0.346	0.022	15.800	0.000	4	0.979
Life Insurance	0.451	0.011	41.120	0.000	5	0.995
Non-life Insurance	0.451	0.011	42.010	0.000	6	1.000

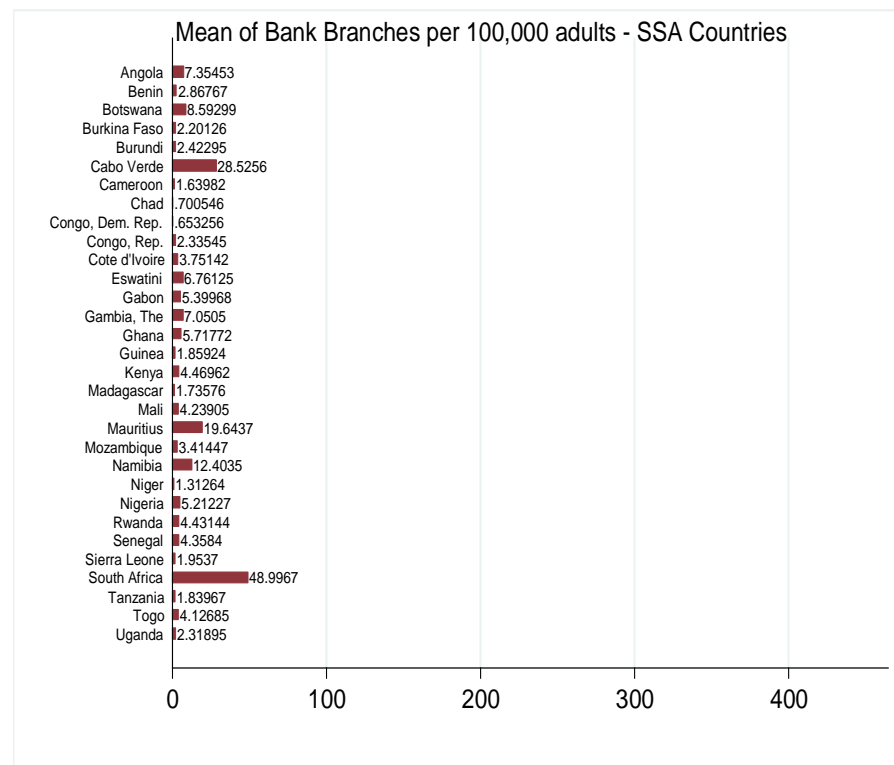
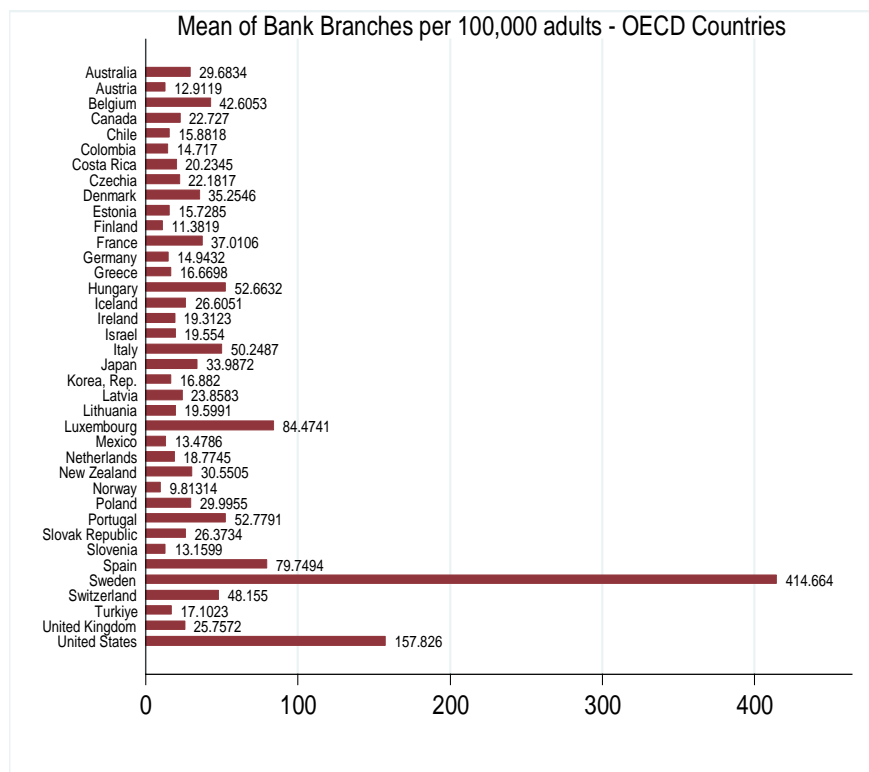
*Source: Authors' estimates*

**Figure A1 - ATMs per 100,000 adults**  
**(Number of ATMs per 100,000 adults)**



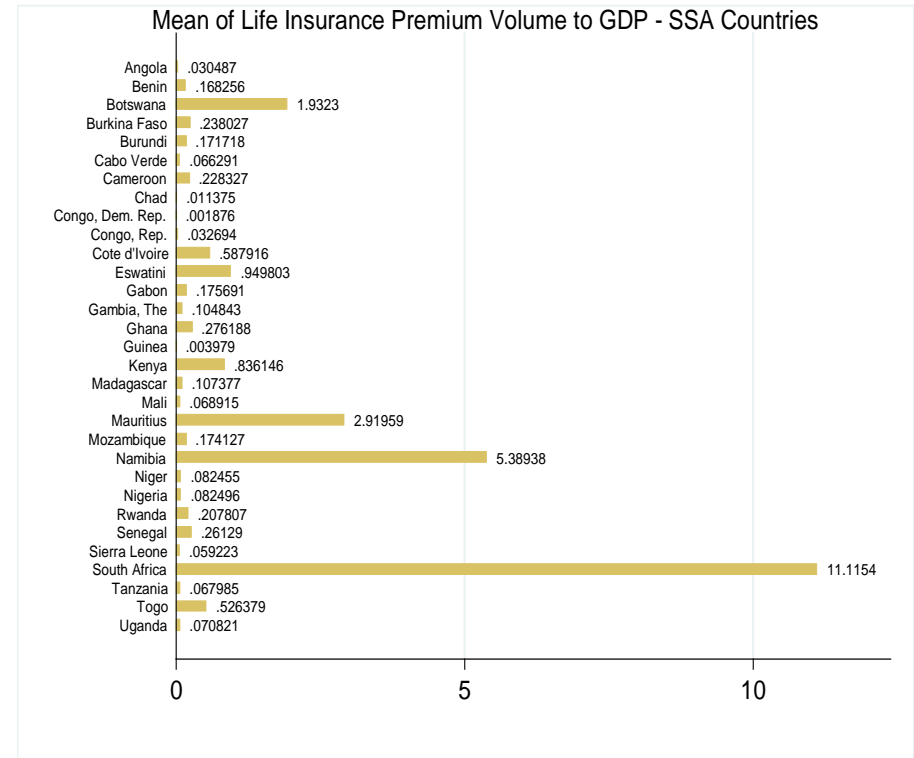
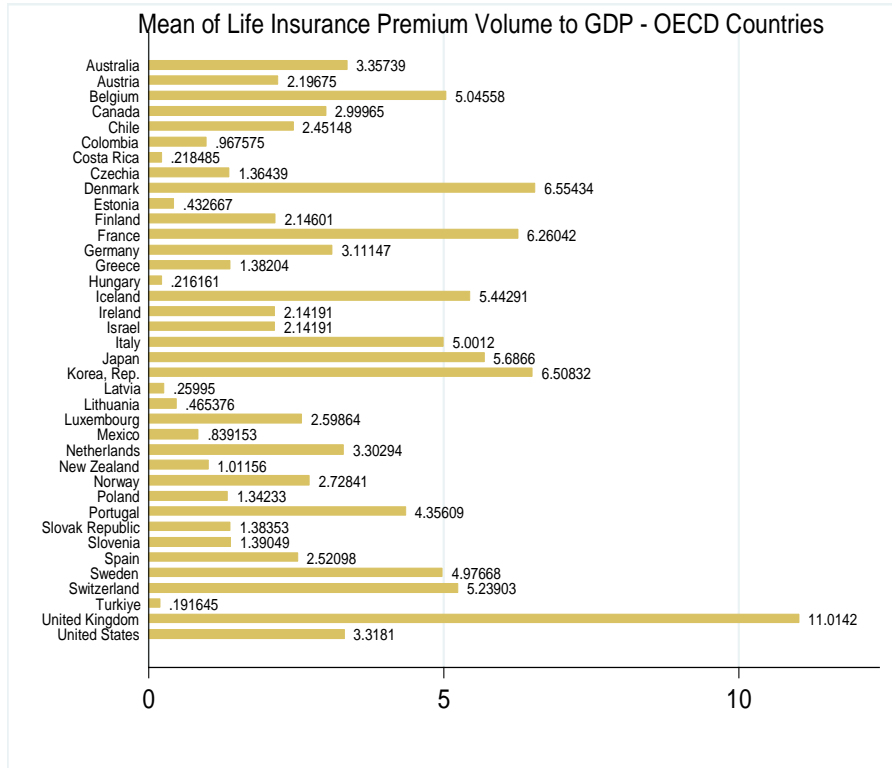
Source: Global Financial Development Database, 2000 - 2021

**Figure A2 - Bank Branches per 100,000 Adults**  
**(Number of commercial bank branches per 100,000 adults)**



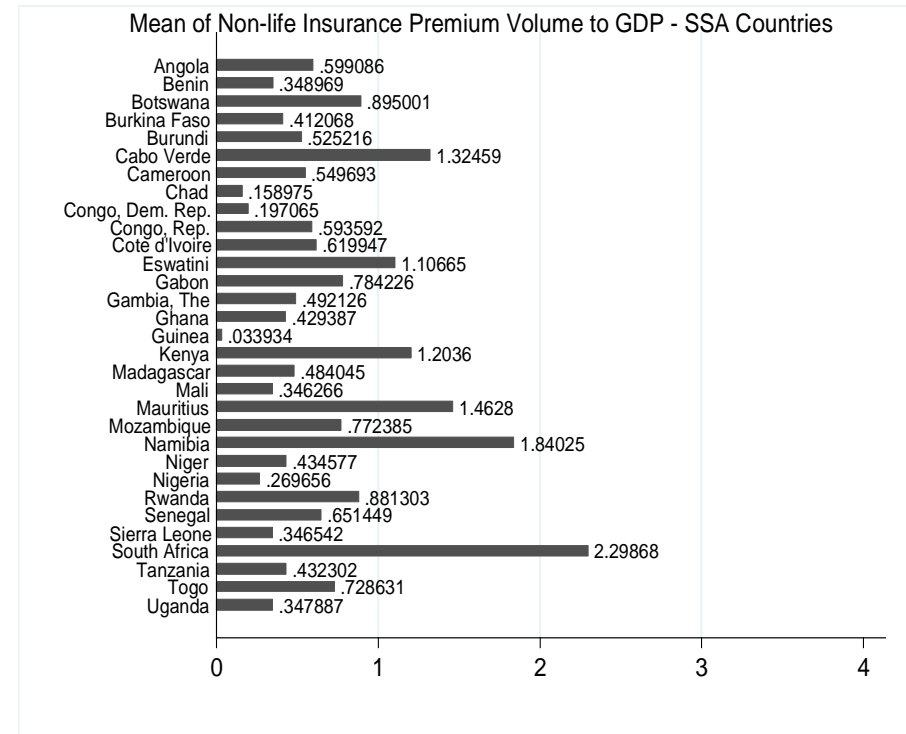
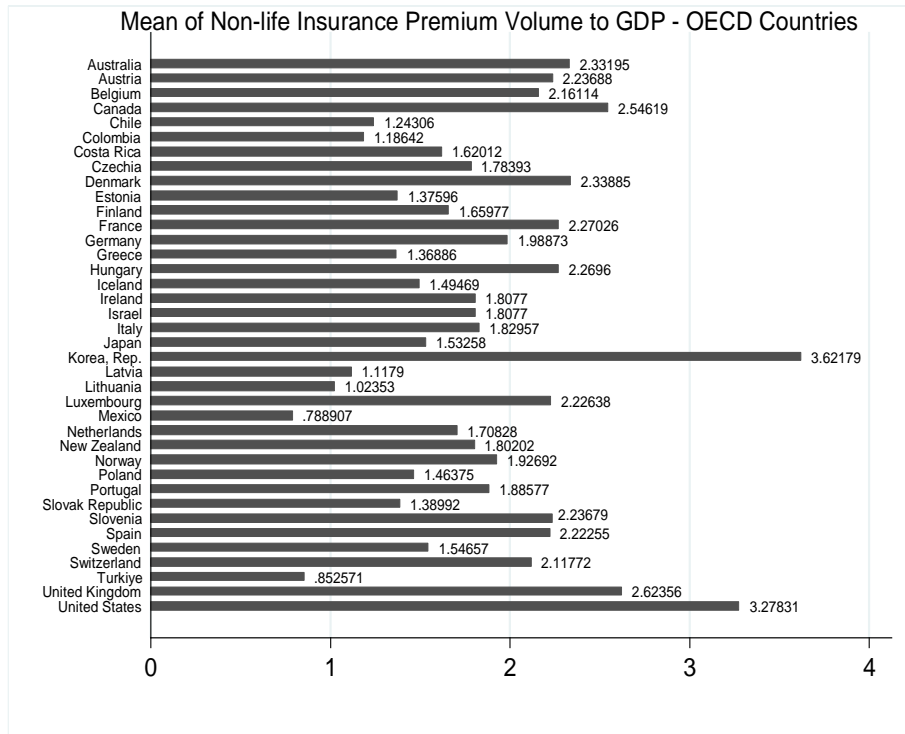
Source: Global Financial Development Database, 2000 - 2021

**Figure A3 - Life Insurance Premium**  
**(Ratio of life insurance premium volume to GDP)**



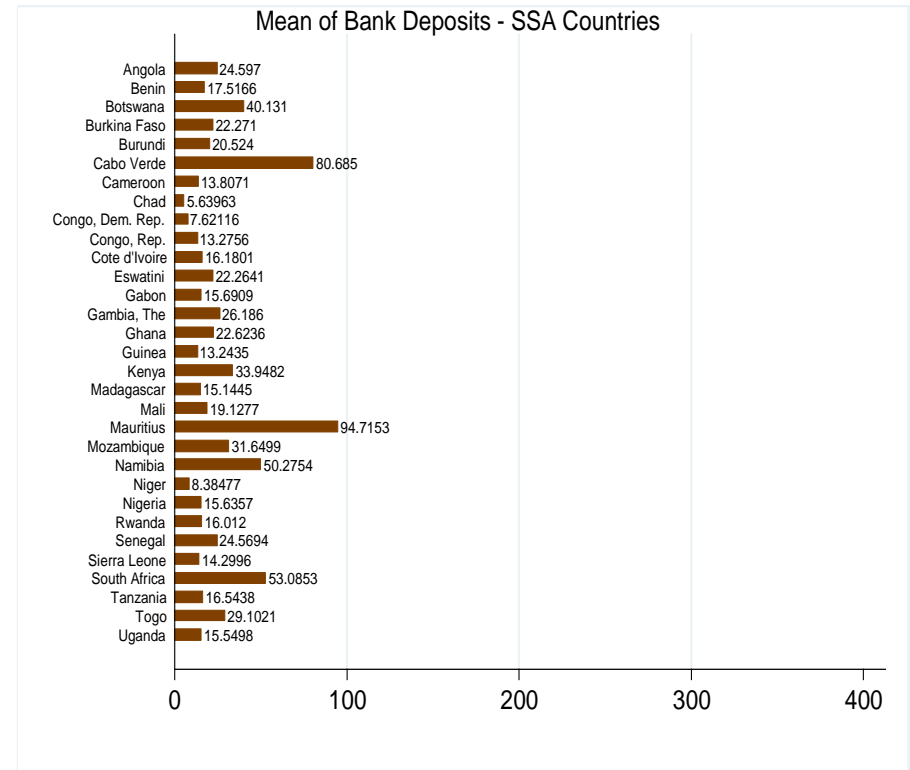
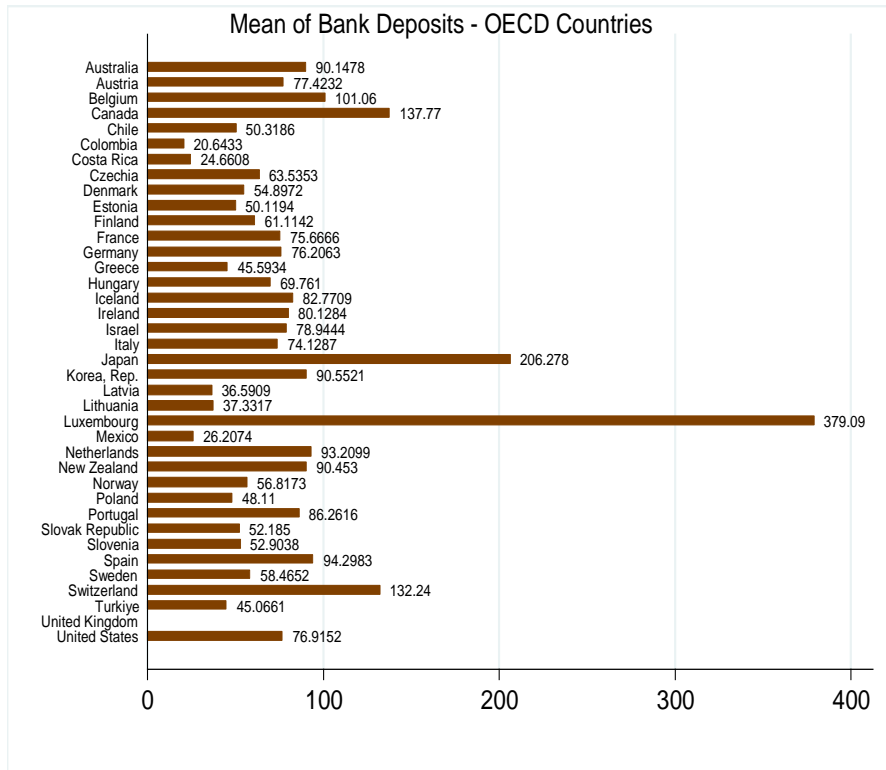
Source: Global Financial Development Database, 2000 - 2021

**Figure A4 - Non-Life Insurance Premium**  
**(Ratio of non-life insurance premium volume to GDP)**



Source: Global Financial Development Database, 2000 - 2021

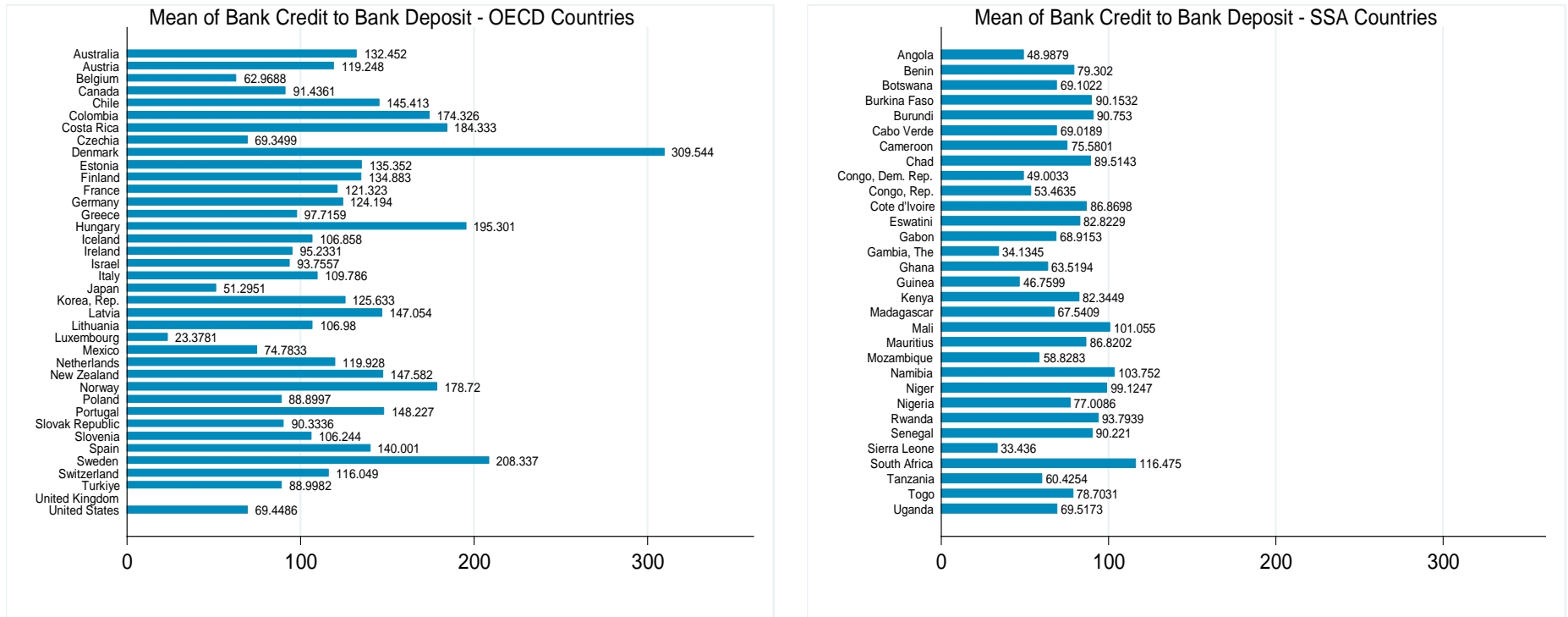
**Figure A5 - Bank Deposits**  
**(Money deposited in banks as a share of GDP)**



Source: Global Financial Development Database, 2000 - 2021



**Figure A6 - Bank Credit to Bank Deposit**  
**(Credit provided by domestic money banks as a share of total deposits)**



Source: Global Financial Development Database, 2000 - 2021

# IES Working Paper Series

2023

1. Josef Bajzik, Tomáš Havránek, Zuzana Iršová, Jiří Novák: *Are Estimates of the Impact of Shareholder Activism Published Selectively?*
2. Klára Kantová: *Ex-Prisoners and the Labour Market in the Czech Republic*
3. Theodor Petřík, Martin Plajner: *Concurrent Business and Distribution Strategy Planning Using Bayesian Networks*
4. Tijmen Tuinisma, Kristof De Witte, Petr Janský, Miroslav Palanský, Vitezslav Titld: *Effects of Corporate Transparency on Tax Avoidance: Evidence from Country-by-Country Reporting*
5. Zuzana Irsova, Pedro R. D. Bom, Tomas Havranek, Heiko Rachinger: *Spurious Precision in Meta-Analysis*
6. Vojtěch Mišák: *Does Heat Cause Homicides? A Meta-Analysis*
7. Fan Yang: *The Impact of Regulatory Change on Hedge Fund Performance*
8. Boris Fisera: *Distributional Effects of Exchange Rate Depreciations: Beggar-Thy-Neighbour or Beggar-Thyself?*
9. Salim Turdaliev: *Powering Up Cleaner Choices: A Study on the Heterogenous Effects of Social Norm-Based Electricity Pricing on Dirty Fuel Purchases*
10. Kseniya Bortnikova: *Beauty and Productivity in Academic Publishing*
11. Vladimír Benáček, Pavol Frič: *Ossified Democracy as an Economic Problem and Policies for Reclaiming its Performance*
12. Petr Janský, Miroslav Palanský, Jiří Skuhrovec: *Public Procurement and Tax Havens*
13. Katarzyna Bilicka, Evgeniya Dubinina, Petr Janský: *Fiscal Consequences of Corporate Tax Avoidance*
14. Evžen Kočenda, Shivendra Rai: *Drivers of Private Equity Activity across Europe: An East-West Comparison*
15. Adam Geršl, Barbara Livorová: *Does Monetary Policy Reinforce the Effects of Macroprudential Policy*
16. Tersoo David Iorngurum: *Method versus cross-country heterogeneity in the exchange rate pass-through*
17. T. D. Stanley, Hristos Doucouliagos, Tomas Havranek: *Meta-Analyses of Partial Correlations Are Biased: Detection and Solutions*
18. Samuel Fiifi Eshun, Evžen Kočenda: *Determinants of Financial Inclusion in Africa and OECD Countries*

All papers can be downloaded at: <http://ies.fsv.cuni.cz>



Univerzita Karlova v Praze, Fakulta sociálních věd  
Institut ekonomických studií [UK FSV – IES] Praha 1, Opletalova 26  
E-mail : [ies@fsv.cuni.cz](mailto:ies@fsv.cuni.cz) <http://ies.fsv.cuni.cz>