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Availability of Banking Services and Income Inequality: Evidence from Developing Economies of Asia Pacific.

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ABSTRACT

This study aims to observe the impact of financial inclusion from a micro perspective, availability of banking services, on income inequality. The analysis is carried out by using an annual panel data set constructed with a sample of eight developing countries of the Asia Pacific region for the period of 2005-2019 to empirically estimate the impact of the availability of banking services on income inequality. A composite variable consisting of several bank branches and automated teller machines is developed to measure the availability of banking services, whereas income inequality is measured by the latest release of the Standardized World Income Inequality Database (SWIID). The results show that greater availability of banking services robustly reduces income inequality across countries. Besides, the study generates evidence that greater women empowerment and better regulatory quality can reduce income inequality. In contrast, urbanization and globalization can deteriorate income equality in the short run. The central message of this study is in favor of further extending the formal banking services to the unbanked segments and females of the population and enhancing regulatory roles with better policy measures to maximize the grand social welfare and ensure sustainable development.

Keywords: Availability of Banking Services, Income inequality, Developing countries.

JEL Classification: F3, G2, O1.

INTRODUCTION

Since poverty was the most unsolved puzzle in the last century for many countries in Asia and the Pacific, most of the countries in the region embarked on a series of structural and policy reforms as part of overall economic reforms to revive economic growth to alleviate poverty. Furthermore, the financial sector was liberalized and restructured with major policy reforms to improve overall economic and financial sector efficiency. As a result, this century started with success stories of the countries in Asia and the Pacific region with sustained economic expansion which successfully lifted millions out of poverty (Heshmati, A., 2015). Although poverty remains a persistent challenge across the region due to various factors, the escalation of income inequality during the last couple of decades raised many concerns among all the stakeholders (Mijis, 2021). Therefore, equitable distribution of the socioeconomic benefits

associated with rapid economic expansion towards narrowing the gap between those at the top and the bottom of income distribution has become the major challenge for the policymakers of the region. Extreme income inequality also slowed down the pace and effectiveness of poverty reduction and thereby caused a threat to sustainable economic growth and development initiatives (Mishchuk et al., 2018). In this regard, the World Bank set goals to end extreme poverty and reduce income inequality by 2030.

Rajan and Zingales, 2003, showed that income inequality might intensify due to underdeveloped financial systems since the poor do not get access to credit due to the lack of collateral and connections. The seminal studies showed that an efficiently liberalized financial system can reduce credit constraints which can help to ensure the efficient allocation of resources and thus equalize income

distribution by allowing the poor to invest adequately in human and physical capital (Banerjee and Newman, 1993; Aghion and Bolton, 1997; Mookherjee and Ray, 2003). As a result, increasing access to financial services for the poor is often considered an effective tool not only to ensure inclusive growth but also to reduce poverty and income inequality. Moreover, economic agents can make longer-term consumption and investment decisions, participate in productive activities, and cope with unexpected short-term shocks if they are provided with adequate access to finance as a part of financial inclusion. Therefore, the critical relationship between financial inclusion, poverty, and income inequality demands extensive research to be realized properly at the national, regional, and global levels.

This realization will help policymakers to formulate and implement effective policy measures to broaden access to financial services leading to a reduction of poverty incidence and equality of income. Given its versatile implications, the United Nations member countries have included financial inclusion as a formal target and a key objective in their development agenda (Sahay et al., 2015). To ensure sustainable development, financial inclusion has become prominent in the global policy agenda. Several studies have been conducted focusing on the determinants of financial inclusion, appropriate measures of financial inclusion, and effective types of financial services at the user and national level. The effects of financial inclusion on economic growth, financial stability, female empowerment, poverty alleviation, governance, and income inequality for different country groups were also comprehensively studied to generate evidence. Nevertheless, there are scopes for further studies focusing on different micro and macro perspectives. This paper aims to enrich the existing literature with fresh evidence from the experience of rapidly growing developing countries in the Asia Pacific region focusing on South Asian countries by examining the relationship between the availability of banking services and income inequality. Therefore, this study addresses some basic yet crucial questions with data from developing countries of the Asia Pacific region: first, does the availability of banking services reduce income inequality? Second, what could be some other significant factors with which the availability of banking services can play a more effective role in reducing income inequality?

Based on the above discussion this study contributes to

the following existent related literature. *First*, it examines the impacts of the availability of banking services following Sarma's approach (2012) on income inequality with a similar set of variables used by Mookherjee & Kalipioni (2010) with a panel data set of 2005–2019. *Second*, it assesses some potential micro and macroeconomic factors such as urbanization, institutional quality, women empowerment, globalization, etc. which can influence income inequality together with the availability of banking services.

The remaining paper is organized as follows. Section 2 presents a review of related theories and literature. Section 3 discusses the data and methodology. Section 4 contains the empirical results and discussion. Finally, Section 5 contains concluding remarks.

AVAILABILITY OF BANKING SERVICES AND INCOME INEQUALITY

This chapter, *firstly*, reviews briefly the available theories and literature regarding factors affecting income inequality. *Secondly*, it reviews the concepts and factors of financial inclusion to locate the importance of the availability of banking services. And *thirdly*, it reviews the links between financial development through the availability of banking services and income inequality.

Traditional literature defined income inequality as the uneven distribution of income and resources among the population which is commonly measured by the decile ratios and the Gini coefficient based on the Lorenz curve. Studies showed that across countries, the income inequality between rich and poor has been rising in recent times (Graafland, J., & Lous, B., 2018). Furthermore, social dissatisfaction arises due to high-income inequality which may fuel social and political unrest, R.J. Barro (2000), and may increase the probability of coups, revolutions, and mass violence (Shehzadi et al., 2019). A comprehensive summary of voluminous literature investigating the factors of income inequality has been done by Mdingi and Ho (2021) from where it could be found that the level of economic development, level of technological development, social-political unrest, savings rate, imperfection of credit markets, political economy, institutions, fertility rate, etc. have influences over income inequality.

Financial inclusion, as a subset of financial development, aims to allow everyone to receive the benefits of economic growth and development by ensuring

accessibility to financial services (Ozili, 2020). Theoretically, several factors such as demographics, literacy levels, social dynamics, local enablers, and inhibitors, availability of informal and alternate channels (together with their cost and convenience), adaptability to change, assimilation with technology, and other exogenous and endogenous factors may influence financial inclusion through the channel of availability of banking services (David-West, et al., 2019). As a multifaceted subject, different stakeholders defined financial inclusion in different ways. World Bank defined financial inclusion as delivering access to useful and affordable financial products and services responsibly and sustainably to meet the needs of individuals and businesses¹. As a measure of the inclusiveness of the financial sector of a country for all members of an economy, Sarma (2012) defined financial inclusion comprehensively with several dimensions such as accessibility, availability, and usage of the formal financial system. Despite having a consensus on how financial inclusion is broadly defined, there is no standard method by which it can be measured.

To find out the factors affecting financial inclusion, some studies evaluated the determinants of financial inclusion with analysis of different country groups and found a wide array of factors affecting financial inclusion such as population density, GDP per capita, money supply as a percentage of GDP, adult literacy rate, internet access, natural resources, institutional deficiencies, rule of law, inflation volatility, financial sector inefficiencies, and Islamic banking activities (Evans and Adeoye, 2016; Allen et al., 2014; Rojas-Suarez and Amado, 2014). On the other hand, several empirical studies were conducted to find out the factors that affect a country's level of financial inclusion. Country-specific factors associated with the level of financial inclusion were examined by Sarma and Pais (2008, 2011) and they presented some possible variables such as income measured by different parameters, adult literacy, rural population, income inequality, physical connectivity indicated by road network, electronic connectivity indicated by phone subscriptions, information availability indicated by internet usage, bank soundness measured by non-performing assets and capital asset ratio, and foreign ownership in the banking sector were significantly associated with the level of financial inclusion. However,

researchers have yet to reach a consensus over a fixed set of factors affecting financial inclusion.

Apart from literature and theories, due to emphasis on new policy objectives of the IMF, World Bank, Asian Development Bank, and G20 countries along with many developing countries increasing attention to financial inclusion and finance for all is evident. Consequently, databases of related indicators such as the Financial Access Survey (FAS) by the International Monetary Fund (IMF) the Global Financial Inclusion Index (Global Findex), and Enterprise Surveys by the World Bank have been developed. Likewise, Sarma (2012) offered a multidimensional index of financial inclusion by combining major dimensions and satisfying rigorous mathematical properties that are comparable across countries and over time. Similarly, a financial access indicator is constructed by Honohan (2007, 2008) combining bank and MFI account numbers from household survey cross-sectional data from a limited number of countries. In all these databases access to financial services has broadly been defined by the number of bank branches and the number of automated teller machines (ATMs) which are used in this study as a composite variable to gauge the availability of banking services.

Most of the extant literature on the influences of financial system development on various macroeconomic factors has focused on a relatively macro perspective considering the size of the financial sector and its impact on growth and inequality as summarized by Levine (2005). However, a significant subset of recent literature focused on a relatively micro perspective taking into account the link between financial access and its effects on inequality. As a result, studies showed that access to financial services is considerably uneven in developing and emerging economies which is assumed to serve the interests of the elites towards reducing competition by limiting access to finance (Perotti and Volpin, 2007). Additionally, Galor and Zeira, (1993); and Galor and Moav, (2004) found that the poor might disproportionately benefit from any improvements in financial access since it could make funding available to the less well-off and their productive investments by reducing credit constraints and this in turn is expected to reduce inequality. On the other hand, Beck et al. (2008) found that greater access to bank branches in the US

¹ UFA 2020 Overview: Universal Financial Access by

2020, World Bank.

lowered income inequality. For other countries including many developing and Asian countries, Honahan (2004), Clarke et al. (2006), and Park and Mercado (2015) found that financial development reduces poverty and income inequality. On the contrary, by introducing a new financial inclusion index for 151 economies Park and Mercado (2018) found no significant effect of financial inclusion on income inequality. Furthermore, García-Herrer and Turégano (2015) found that financial inclusion contributed to reducing income inequality whereas the contribution of financial deepening was not evident. On the other hand, with the data of Mexico, Salazar-Cantú et al. (2015) observed greater income inequality with higher financial inclusion at the initial stage which would then move to income equality with continuous growth of financial inclusion in the later stage. Therefore, it could be said that the relationship between financial inclusion through the availability of banking services and income inequality is evident from all these studies though the results showed mixed effects and hence a comprehensive understanding of this relationship is yet to be established. As a result, this study tries to add some evidence to the existing literature regarding the impacts of the availability of banking services on income inequality from different country groups with different sets of variables.

METHODOLOGY AND DATA

Selection of Countries and Variables

This study considers the Asia Pacific as the region of observation with exclusion and inclusion criteria considering the heterogeneity of the countries mostly in terms of size and economic status. For example, Tuvalu, Vanuatu, Cook Islands, French Polynesia, etc. are islands and mostly territories of other countries. On the other hand, Australia, Japan, the United States, etc. are developed economies whereas Burma (Myanmar), Lao PDR, etc. are countries with insufficient data. Therefore, these countries are excluded under the exclusion criteria. Finally, eight developing countries such as Bangladesh, Chile, China, India, Indonesia, Malaysia, Pakistan, and Peru, have been selected from the list of countries in the Asia Pacific. These countries experienced high growth during their take-off stage of development and are facing similar macro and socio-economic challenges in the existing stage such as income inequality, financial

inclusion, urbanization, regulatory quality, women empowerment, trade openness, etc. Among all these factors, ensuring income equality has become the toughest challenge for not only these eight countries but also for all the developing countries in general. Regarding other factors, urbanization plays a crucial role in engaging marginalized groups of people in the development process. To ensure governance as well as quality of development regulatory quality becomes essential. Women's empowerment has become indispensable for the continuation of the growth momentum and inclusiveness. Eliminating trade barriers to ensure better trade openness has always been a pressing concern for all developing countries across the globe. All these factors might affect the distribution of wealth and income. Therefore, this study concentrates on income inequality as the observed variable and all these factors in the set of explanatory variables to see how these variables can explain the phenomena of income inequality. To observe the effects of explanatory variables on income inequality, macroeconomic variables such as inflation and gross capital formation have been taken as control variables since we assumed that the observed countries are in a similar development trajectory. These explanatory variables are considered by following previous studies of Honohan (2007, 2008), Sarma and Pais (2008, 2011), Allen et al. (2014), Rojas-Suarez and Amado (2014), Swamy (2014), Alter and Yontcheva (2015), García-Herrer and Turégano (2015), Park and Mercado (2015, 2018), Evans and Adeoye (2016), Schmied and Marr (2016), Aslan et al. (2017), and Jabir et al. (2017).

Data

We have constructed a panel data set with the secondary data of eight Asia Pacific countries, Bangladesh, Chile, China, India, Indonesia, Malaysia, Pakistan, and Peru, for the period from 2005 to 2019 based on the availability of the data. The data have been taken from the Financial Access Survey (FAS) database of the International Monetary Fund (IMF), Standardized World Income Inequality Database (SWIID), World Development Indicator (WDI), and World Governance Indicator². The SWIID (Version-9.0) constructed by Frederick Solt has been used to measure income inequality. The focused explanatory variable, availability of banking services, indicates the depth of geographic or demographic

sources are presented in Appendix A.

² Details of the variables and data management and data

penetration of banking services in the form of bank branches of commercial banks, and ATMs. This variable is measured by a composite variable of two indicators: the number of commercial bank branches per 100,000 adults (Sarma 2012; Cámara and Tuesta 2014; Rojas-Suarez and Amado 2014; Park and Mercado 2015) and the number of automated teller machines per 100,000 adults (Sarma 2012; Cámara and Tuesta 2014; Rojas-Suarez and Amado 2014; Park and Mercado 2015). To form the composite variable, 0.70 weight was assigned to the number of commercial bank branches, and 0.30 weight was assigned to the automated teller machine (Omar and Inaba, 2020). Changes of inflation and gross capital formation are the control variables since the former reflects the price scenario of a country and the latter shows the status of fixed assets and inventory of the economy. These two factors represent the development momentum of an economy in a more dynamic way than the traditional approaches of per capita GDP and GNI. We use all the data in current USD to match the ratio with the corresponding variables.

Empirical Technique

Panel data techniques enable us to take into account how different levels of financial inclusion over time affect the level of inequality. Moreover, in a panel setting, one can separate unobserved country-specific and time fixed effects from the error term and subsequently reduce bias from the estimated coefficient (Wooldridge 2012:484, Gujarati 2003: 636). Both fixed effects and random effects model are commonly used as estimation applied to panel data. However, in the present setting fixed effects would be ideal, as we intend to control for unobserved country

and time fixed effects.³ The model is specified as:

$$\begin{aligned} \text{Lngini}_{it} = & \beta_0 + \beta_1 \text{lnavl}_{i,t} + \beta_2 \text{lngcf}_{i,t} + \beta_3 \text{lninf}_{i,t} \\ & + \beta_4 \text{lnurb}_{i,t} + \beta_5 \text{lnfe}_{i,t} + \beta_6 \text{rq}_{i,t} \\ & + \beta_7 \text{lnxmy}_{i,t} + \gamma_t + \nu_i + \epsilon_{it} \dots \dots \dots (1) \end{aligned}$$

Where, i indicates country and t indicates year in the sample, *lngini* = log of the Gini coefficient for each country, *lnavl* = log of composite variable availability of banking services, *lngcf* = log of gross capital formation, *lninf* = log of rate of inflation, *lnurb* = log of share of agriculture in GDP as a proxy variable for urbanization, *lnfe* = log of female employment, *rq* = regulatory quality, *lnxmy* = log of ratio of total trade to GDP to measure trade openness. Time fixed effects and country fixed effects are denoted by γ_t and ν_i respectively. Time fixed effects have been introduced to capture any variation in financial development between years which might not be covered by the explanatory variables in the model. The idiosyncratic error term is indicated by ϵ_{it} . We expect that availability of banking services, gross capital formation, urbanization, female employment, regulatory quality, and trade openness are negatively associated with income inequality. Hence, positive development of these factors will reduce income inequality.

EMPIRICAL RESULTS AND DISCUSSION

This chapter presents the empirical results and discussions on the influence of availability of banking services on income inequality.

Following the framework of panel data analysis techniques, we first ensured that the data set is strongly balanced. The following table presents the summery statistics:

Table 1. Summery statistics of the panel data set.

Variable	Sample Size	Mean	Std. Dev.	Min	Max
Availability of banking services (avl)	120	2.62	0.67	0.83	3.76
Urbanization (urb)	120	2.37	0.55	1.20	3.22
Female employment (fe)	120	3.66	0.42	2.91	4.24
Gini coefficient (gini)	120	3.79	0.13	3.58	4.02
Gross capital formation (gcf)	120	3.29	0.30	2.65	3.84
Trade openness (xmy)	120	3.98	0.46	3.23	5.32
Inflation (inf)	120	1.64	0.60	-1.30	3.06
Regulatory quality (rq)	120	0.01	0.72	-1.07	1.54

Source: STATA output.

³ We conducted a Hausman test which suggested that a fixed effects static panel estimator would be a superior

estimator of our model.

To ensure the robustness of the model, some basic diagnostic tests were done. Firstly, the Levin-Lin-Chu (2002) test showed that all the panels are (trend) stationary. Secondly, the Hausman test showed that the

fixed effect model is suitable for this specified analysis which could also be logically perceived from the heterogeneous nature of the economies in many other socio-economic indicators.

Table 2. Availability of banking services and income inequality (fixed effect estimation).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	lngini	lngini	lngini	lngini	lngini	lngini	lngini
Availability of banking services (lnavl)	-0.0145**	-0.0149**	-0.0155**	-0.0174***	-0.0128**	-0.0127*	-0.0173**
	(-3.26)	(-3.23)	(-3.36)	(-3.92)	(-2.68)	(-2.17)	(-2.86)
Gross capital formation (lngcf)		-0.0138	0.000413	0.0319	0.00318	-0.0139	0.0530*
		(-0.60)	(0.02)	(1.25)	(0.13)	(-0.60)	(2.03)
Inflation (lninf)		-0.00765	-0.00732	-0.0118*	-0.00827	-0.00924	-0.00999
		(-1.48)	(-1.47)	(-2.34)	(-1.61)	(-1.60)	(-1.94)
Urbanization (lnurb)			0.0328				0.0257
			(0.72)				(0.59)
Female employment (lnfe)				-0.106***			-0.108**
				(-3.57)			(-3.28)
Regulatory quality (rq)					-0.0378		-0.0319
					(-1.57)		(-1.39)
Trade openness (lnxmy)						0.0144	-0.00752
						(0.64)	(-0.32)
Constant	3.826***	3.885***	3.840***	4.137***	3.825***	3.825***	4.101***
	(322.20)	(52.55)	(53.11)	(41.56)	(46.25)	(31.78)	(24.83)
Observations	120	120	112	120	120	120	120
R-squared	0.1773	0.1366	0.0093	0.1251	0.4054	0.0029	0.1801

t statistics in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Source: STATA output.

Table 2 presents the estimation results of the impact of the availability of banking services on income inequality in eight developing countries of the Asia Pacific region. Model (1) shows an association between the availability of banking services and income inequality excluding all other variables and the association is strongly negative. This result is further corroborated by the inclusion of control variables on macroeconomic indicators in the model (2). From model (3) to model (6), one additional explanatory variable is employed to see the effect of that variable under the controlled variable scenario. In model (3), inclusion of urbanization makes the impact of the availability of banking services on income inequality stronger although urbanization itself is weakly positively associated with income inequality. It means urbanization may somewhat worsen income distribution. It may happen since social elites may disproportionately benefit in the preliminary stages of urbanization which may dissolve in the later stages of

urbanization. After including female employment in the model (4), we observe that the availability of banking services can further reduce income inequality whereas female employment is highly negatively associated with the dependent variable. This result can be perceived from the economic benefits of women empowerment which includes financial literacy of women for their active participation in the financial system of the economy. Among other explanatory variables, regulatory quality in the model (5) is also negatively related to income inequality, although it weakens the reducing effect of the availability of banking services on income inequality. It implies that improving the regulatory quality helps to improve income distribution. It might happen since better institutional quality may not only reduce the loopholes such as corruption of the economy but also may harness the huge informal sector of these countries towards better synchronization and higher productivity and help mainstream them to the

national development programs. In model (6), trade openness is introduced to see the effect of globalization in general and the effect of eliminating the barriers to trade in specific. Trade openness is not only positively associated with the dependent variable but also lowers the impact of the main independent variable over the dependent variable. The result and strength of the model are like the model (3) with urbanization. Hence, we can say that higher trade openness will facilitate the benefits of the rich in the short run. But in the long run, the poor will also benefit from higher employment and wages. Finally, in model (7) the fixed effect estimates show that there is a highly significant negative association between the availability of banking services and income inequality even after the inclusion of all the explanatory variables, and the association is prevalent across all the models with the expected negative signs as well as strong statistical significance.

It is evident from model (1) to model (7) that a 1 percentage increase in the availability of banking services will lead to a decrease in income inequality ranging from 0.014 to 0.017 percent. This implies that greater availability of banking services is effective in reducing income inequality. The finding for the main variable of interest of this study is broadly consistent with Dabla-Norris et al. (2015), García-Herrer and Turégano (2015), Salazar-Cantú et al. (2015), and Omar and Inaba (2020) but differs significantly from Honohan (2007, 2008) and Park and Mercado (2015), who found econometric evidence that financial inclusion lowers income inequality. Moreover, Park and Mercado (2018) found an insignificant relationship between financial inclusion and income inequality. These different findings may be due to differences in measuring techniques and variable selection of financial inclusion, differences in sample sizes and periods, different methodologies, etc.

CONCLUSION

The results of this study strongly indicate that micro-focused measures of financial inclusion, and availability of banking services, can reduce income inequality in developing countries. Hence, the availability of banking services positively affects income distribution by providing greater access to bank branches to the poor or low-income earning or low-asset-holding people, among which a greater percentage is still unbanked. Improved access to financial services through the availability of

banking services has multidimensional effects on sustainable development. It reduces income inequality and poverty, promotes economic growth, and enriches people's lives. Nevertheless, commercial banks in the private sector may consider expanding the network of bank branches and improving accessibility for customers as costly. In this regard, appropriate policy support is required to increase the penetration of banking services and eliminate barriers to access while maintaining the balance between profitability and the public interest.

The study findings are also supported by the findings of Cull (2001), Hryckiewicz, and Kowalewski (2010), who suggested that policymakers may pursue policies to promote more competition in the banking sector through greater deregulation and privatization, which could ensure greater availability of banking services, especially in developing countries. Besides, this study presents evidence of the influence of some other interesting factors on income inequality, such as urbanization from the household structure perspective, female employment from women empowerment perspective, regulatory quality from governance perspective. However, due to the unavailability of data on different measures of financial inclusion before 2004, the panel nature of the data set of this study constitutes a short time span which impedes it from doing some statistical diagnostic tests and using sophisticated econometric models. This study could be further extended with a larger data set for different groups of countries controlling for endogeneity with properly developed suitable instrumental variables to estimate causal relations with observational data.

DECLARATION

The authors are alone responsible for the views or opinions expressed in this paper and not in any way the institution where they are working.

REFERENCES

- Aghion, P., & Bolton, P. (1997). A trickle-down theory of growth and development. *Review of economic studies*, 64, 151-162.
- Allen, F., Carletti, E., Cull, R., Qian, J. Q., Senbet, L., & Valenzuela, P. (2014). The African financial development and financial inclusion gaps. *Journal of African economies*, 23(5), 614-642.
- Alter, A., & Yontcheva, B. (2015). *Financial Inclusion and*

- Development in the CEMAC*. International Monetary Fund.
- Aslan, G., Deléchat, C., Newiak, M. M., & Yang, M. F. (2017). *Inequality in financial inclusion and income inequality*. International Monetary Fund.
- Banerjee, A. V., & Newman, A. F. (1993). Occupational choice and the process of development. *Journal of political economy*, 101(2), 274-298.
- Barro, R. J. (2000). Inequality and Growth in a Panel of Countries. *Journal of economic growth*, 5(1), 5-32.
- Clarke, G. R., Cull, R., & Martinez Peria, M. S. (2001). Does foreign bank penetration reduce access to credit in developing countries? Evidence from asking borrowers. *Evidence from Asking Borrowers (September 2001)*.
- Dabla-Norris, M. E., Kochhar, M. K., Suphaphiphat, M. N., Ricka, M. F., & Tsounta, M. E. (2015). *Causes and consequences of income inequality: A global perspective*. International Monetary Fund.
- David-West, O., Aluko, T., & Adetunji, O. (2019). Mobile money: A panacea for financial exclusion in emerging markets. *Journal of Banking*, 8(1), 27-55.
- Evans, O. (2016). Determinants of financial inclusion in Africa: A dynamic panel data approach.
- Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *The review of economic studies*, 60(1), 35-52.
- Galor, O., & Moav, O. (2004). From physical to human capital accumulation: Inequality and the process of development. *The Review of Economic Studies*, 71(4), 1001-1026.
- Graafland, J., & Lous, B. (2018). Economic freedom, income inequality and life satisfaction in OECD countries. *Journal of Happiness Studies*, 19(7), 2071-2093.
- Heshmati, A., Maasoumi, E., & Wan, G. (2015). *Poverty reduction policies and practices in developing Asia* (p. 314). Springer Nature.
- Honohan, P. (2004). Financial development, growth and poverty: how close are the links?. In *Financial development and economic growth* (pp. 1-37). Palgrave Macmillan, London.
- Honohan P (2007) Cross-country variation in household access to financial services. World Bank Paper Conference on "Access to Finance". Washington, DC.
- Honohan, P. (2008). Cross-country variation in household access to financial services. *Journal of Banking & Finance*, 32(11), 2493-2500.
- Mdingi, K., & Ho, S. Y. (2021). Literature Review on Income Inequality and Economic Growth. *MethodsX*, 101402.
- Mijs, J. J. (2021). The paradox of inequality: Income inequality and belief in meritocracy go hand in hand. *Socio-Economic Review*, 19(1), 7-35.
- Mishchuk, H., Samoliuk, N., Bilan, Y., & Streimikiene, D. (2018). Income inequality and its consequences within the framework of social justice. *Problemy Ekorożwoju*, 13(2).
- Mookherjee, D., & Ray, D. (2003). Persistent inequality. *The Review of Economic Studies*, 70(2), 369-393.
- Mookerjee, R., & Kalipioni, P. (2010). Availability of financial services and income inequality: The evidence from many countries. *Emerging Markets Review*, 11(4), 404-408.
- 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), 1-25.
- Ozili, P. K. (2020, January). Financial inclusion research around the world: A review. In *Forum for social economics* (pp. 1-23). Routledge.
- Park, C. Y., & Mercado, R. (2015). Financial inclusion, poverty, and income inequality in developing Asia. *Asian Development Bank Economics Working Paper Series*, (426).
- Park, C. Y., & Mercado, R. (2018). Financial inclusion: New measurement and cross-country impact assessment. *Available at SSRN 3199427*.
- Perotti, E., & Volpin, P. (2007). *Investor protection and entry* (No. 07-006/2). Tinbergen Institute discussion paper.
- 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.
- Rojas-Suarez, L., & Amado, M. (2014). Understanding Latin America's financial inclusion gap. *Center for Global Development Working Paper*, (367).
- Sahay, M. R., Cihak, M., N'Diaye, M. P., Barajas, M. A., Mitra, M. S., Kyobe, M. A., ... & Yousefi, M. R. (2015). *Financial inclusion: can it meet multiple macroeconomic goals?*. International Monetary Fund.
- Salazar-Cantú, J., Jaramillo-Garza, J., & Álvarez-De la

- Rosa, B. (2015). Financial inclusion and income inequality in Mexican municipalities. *Open Journal of Social Sciences*, 3(12), 29.
- Sarma, M. (2008). Working paper no: 215, Index of Financial Inclusion. Indian Council for Research on International Economic Relations.
- Sarma, M., & Pais, J. (2011). Financial inclusion and development. *Journal of international development*, 23(5), 613-628.
- Sarma, M. (2012). Index of Financial Inclusion–A measure of financial sector inclusiveness. *Centre for International Trade and Development, School of International Studies Working Paper Jawaharlal Nehru University. Delhi, India.*
- Schmied, J., & Marr, A. (2016). Financial inclusion and poverty: The case of Peru. *Regional and Sectoral Economic Studies*, 16(2), 1-26.
- Shehzadi, I., Siddique, H. M. A., & Majeed, M. T. (2019). Impact of Political Instability on Economic Growth, Poverty and Income Inequality'. *Pakistan Business Review*, 20(4), 825-38.
- Swamy, V. (2014). Financial inclusion, gender dimension, and economic impact on poor households. *World development*, 56, 1-15.
- World Bank Group. (2013). *Global financial development report 2014: Financial inclusion* (Vol. 2). World Bank Publications.

Appendix A: Details of the variables

Type of Variables	Name of Variables	Descriptions	Source
Dependent Variable (DV)	Income Inequality (Ingini)	Estimate of Gini index of inequality in equalized (square root scale) household market (pre-tax, pre-transfer) income, using Luxembourg Income Study data as the standard	SWIID (Version-9.0) constructed by Frederick Solt
Set of Independent Variables (IVs)	Bank Branches	Number of commercial bank branches per 100,000 adults	Financial Access Survey (FAS), 2020, IMF
	ATMs	Number of ATMs per 100,000 adults	Financial Access Survey (FAS), 2020, IMF
	Inflation rate (lninf)	Annual percentage change in the average consumer price index	World Development Indicators, 2021, World Bank
	Female employment rate (Infe)	Employment to population ratio, 15+, female (%) (modeled ILO estimate). Ages 15 and older are generally considered the working-age population.	World Development Indicators, 2021, World Bank
	Gross Capital Formation (Ingcf)	Gross capital formation (% of GDP). Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	World Development Indicators, 2021, World Bank
	Urbanization (Inurban)	Share of agriculture in GDP. Agriculture, forestry, and fishing, value added (% of GDP). Agriculture corresponds to ISIC divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is a proxy for urbanization.	World Development Indicators, 2021, World Bank
	Trade Openness	Ratio of total trade (sum of export	World Development

(lnxmy)	and import of g&s) and GDP. Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	Indicators, 2021, World Bank
Regulatory Quality (reg_quality)	Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance).	The Worldwide Governance Indicators, 2021

* SWIID, Retrieved July 10, 2021, from https://fsolt.org/blog/2020/10/21/swiid-version-9_0/.

** Financial Access Survey (FAS), Retrieved July 10, 2021, from <https://data.imf.org/?sk=E5DCAB7E-A5CA-4892-A6EA-598B5463A34C>.

*** World Development Indicators (WDI), <https://databank.worldbank.org/source/world-development-indicators>.

*** The Worldwide Governance Indicators, www.govindicators.org.

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