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THESIS

FINANCE-INEQUALITY NEXUS IN EMERGING COUNTRIES

AMBREEN SULTAN

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APPROVAL PAGE

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Arts in Financial Economics.

Examining Commitee Members:

	OPINION	SIGNATURE
Dr. Nihat Gümüş (Thesis Advisor)	Approved	
Prof. Dr. Mehmet Saraç	Approved	
Prof. Dr. Mustafa Kemal Yılmaz	Approved	

This is to confirm that this thesis/project complies with all the standards set by the School of Graduate Studies Ibn Haldun University:

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Name and Surname: Ambreen Sultan

Signature:

ABSTRACT

FINANCE-INEQULITY NEXUS IN EMERGING COUNTRIES

Sultan, Ambreen
MA in Financial Economics
Thesis Advisor: Prof.Dr. Nihat Gümüş
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This study intends to empirically test the relationship between financial development and income inequality in advanced emerging and secondary emerging countries. To study the impact of financial development on income inequality, we cover five bank-based and market-based dimensions of financial development that are access, depth, efficiency, stability, and liberalization. We use a panel of 20 countries for the time period between 2000-2017 and estimate the empirical model by employing dynamic panel data method of Generalized Method of Moments (GMM). Our findings suggest that only one dimension of bank-based financial development namely depth is significant in reducing income inequality. In case of stock market-based financial development three dimensions namely depth, efficiency, and stability are important to alleviate income inequality. We also find strong support for income inequality reducing impact of financial liberalization. We conclude that, in our sample of emerging countries, stock market-based financial development plays a more significant and effective role in abridging income inequality than the bank-based financial development.

Keywords: Banking System Development, Emerging Countries, Generalised Method of Moments, Income Inequality, Stock Market Development.

ÖZ

GELİŞMEKTE OLAN ÜLKELERDE FİNANS- EŞİTSİZLİK İLİŞKİSİ

Sultan, Ambreen

Finansal Ekonomi Yüksek Lisans
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Bu çalışma, ileri düzey gelişmekte olan ve ikincil düzeyde gelişmekte olan ülkelerde finansal gelişme ve gelir eşitsizliği arasındaki ilişkiyi ampirik olarak test etmeyi amaçlamaktadır. Burada, finansal gelişimin gelir eşitsizliği üzerindeki etkisini incelemek amacıyla erişim, derinlik, verimlilik, istikrar ve liberalleşme olmak üzere, finansal gelişmenin banka tabanlı ve piyasa tabanlı beş boyutu ele alınmaktadır. Bu çalışmada, 20 ülkenin 2000-2017 yılları arasındaki sürecinden oluşan bir panel kullanılmış olup Genelleştirilmiş Momentler Metodu'nun (GMM) dinamik panel veri yöntemini kullanarak ampirik model öngörülmeye çalışılmıştır. Bulgular, banka tabanlı finansal gelişimin sadece bir boyutunun; "derinliğin" gelir eşitsizliğini azaltmada önemli olduğunu göstermektedir. Borsa tabanlı finansal gelişme durumunda ise gelir eşitsizliğini azaltmak için derinlik, verimlilik ve istikrar gibi üç boyut önemli olduğu ortaya çıkmıştır. Ayrıca, mali liberalleşmenin gelir eşitsizliğini azaltmada önemli bir rol oynadığı saptanmıştır. Sonuç olarak, gelişmekte olan ülkeler örneğinde, borsa tabanlı finansal gelişmenin, gelir eşitsizliğini azaltmada, banka tabanlı finansal gelişmeden daha önemli ve etkili bir role sahip olduğu sonucuna varılmıştır.

Anahtar Kelimeler: Bankacılık Sistemi Geliştirme, Borsa Geliştirme, Gelir Eşitsizliği, Gelişmekte Olan Ülkeler, Genelleştirilmiş Momentler Yöntemi

DEDICATION

I dedicate my master's dissertation to my late father, Sultan Mehmood, who instil in me the love and passion of hard work. I hope I made him proud. I also dedicate my dissertation to my kind, loving and caring mother, who always support me in my academic endeavours. Her kind prayers and support always remain with me and make it possible for me to achieve my academic endeavours.

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Ambreen Sultan

ISTANBUL, 2019

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CHAPTER 1

INTRODUCTION

The financial institutions and markets are vital for the development and growth of economies. They play an essential and important role of channeling resources between different sectors of an economy and mobilize savings into investments by means of facilitating transactions. It is widely believed that a well functioning financial system is critical for efficient capital allocation, economic growth and poverty alleviation. While some social scientists have extended significant efforts to highlight the positive effects of financial system development on macro-economic phenomenon such as income distribution and poverty alleviation. Others empirical researches content that the financial system development has profound negative impact on poverty and income distribution patterns.

In recent years many researchers have increasingly explore the relationship between financial inclusion and inequality, financial liberalization and inequality, and bank crisis and inequality etc. This implies that many other factors such as lack of access to financial services, financial efficiency and stability of financial institutions and markets are also critical for economic development, poverty and income inequality. In this study we extend previous researches on the relationship between financial development and income inequality by examining five different dimensions of bank-based and stock market-based financial development namely access, depth, efficiency, stability and liberalization.

1.1 Statement of Problem

The literature on finance-inequality nexus provides diverse hypothesis. To date the link between financial development and income inequality is ambiguous and inconclusive. Depending on different empirical models one strand of literature advocates pro-poor effects of financial development whereby a developing financial system can benefit poor by means of enhancing efficiency, depth and eliminating credit constraints for poor. On the other hand, another strand of literature stresses that financial development may deteriorates income inequality due to capital market imperfections, and credit policies that assist the one segment of society more than the unprivileged segment of society. Most of the literature that attempt to study the relation between financial development and income inequality measure financial development using indicators such as bank private credit to GDP, liquid liabilities to GDP, deposit money bank assets and broad money to GDP etc. These indicators of financial development only capture financial deepening of financial system development. The problem in consideration is that there is a gap in the literature to have a comprehensive study that captures different dimensions of financial development to assess the impact of financial development on income inequality especially in the case of emerging countries. This thesis intents to fill this gap.

1.2. Research Objective

This thesis aims to study the impact of financial development on income inequality by covering five different dimensions financial system development namely financial access, financial deepening, financial efficiency, financial stability and financial liberalisation. The World Bank Global Financial Development Database (GFDD) provides a comprehensive database covering four dimensions of financial system development. We aim to utilize this database to present a more comprehensive and multidimensional relationship between financial development and income inequality.

1.3 Research Questions

The study addresses following questions:

1. Does bank base and stock market base financial access help in reducing income inequality in advanced emerging and secondary-emerging market economies?
2. Does bank base and stock market base financial depth help in reducing income inequality in advanced emerging and secondary emerging market economies?
3. Does bank base and stock market base financial efficiency help in reducing income inequality in advanced emerging and secondary emerging market economies?
4. Does bank base and stock market base financial stability help in reducing income inequality in advanced emerging and secondary emerging market economies?

5. Does financial liberalization reduces help in reducing income inequality advanced emerging and secondary emerging market economies?

1.4 Significance of the Study

There is extensive literature available on the link between financial development and income inequality. But most of the literature only focuses on one dimension of financial development that is financial depth. In recent years some studies have attempted to analyse the impact financial access, as measure by financial inclusion, on income inequality. While some others have studied the relationship between financial liberalization and income inequality. Specially, the impact of financial system efficiency and stability on income inequality is very scarce. This thesis adds to the scarce evidence available on link between financial development and income inequality in the case of emerging countries by considering five different dimensions (access, depth, efficiency, stability and liberalization) of banking system and stock markets development and their impact on income inequality.

The thesis comprises of five chapters, Chapter 1 provides an introduction of the thesis. The Chapter 2 reviews the literature on the link between financial development and income inequality. Chapter 3 describes the empirical model of the thesis; explanation of the study variables, the data sources, the sample and the time frame adopted. It also describes the empirical methodology used to estimate the results. Chapter four presents empirical findings and discussion. Finally, Chapter 5 concludes the findings by proposing some recommendations for policy making and guidelines for future studies.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the relevant theoretical and empirical literature on the relationship between financial development and income inequality. In addition, we point out the different proxy measures, sample and statistical methods used by different studies. Finally, we highlight the research gap that this study intents to fill. A review of literature suggests that most of the earlier literature attempts to analyse the direction of relationship between economic growth and income inequality and between financial development and economic growth (Kuznets, 1955; Williamson, 1965; Patrick, 1966; Banerjee & Newman, 1993; Chen & Fleisher, 1996; Xiaobo & Zhang, 2003; Boyreau-Debray, 2003). Due to rapid economic growth and financial markets development, the emphasis is put to analyse the simultaneous relation between economic growth, financial development and inequality (Banerjee & Duflo, 2003; Clarke, Xu, & Zou, 2006).

Financial system development is vital for economic growth (Khalifa Al-Yousif, 2002; Hassan et al., 2011; Yu et al., 2012), however it significantly impacts income inequality in an economy. While some empirical studies have found that financial system development decreases income inequality and benefits poor (Clarke et al., 2006; Beck, Demirgüç-Kunt, & Levine, 2007; Mookerjee and Kalipioni, 2010; Agnello & Sousa, 2012; Akhter, Liu, & Daly, 2010; Chemli, 2014; Ben Naceur & Zhang, 2016), others have concluded that financial development deteriorate income inequality and hurts poor (Law & Tan, 2009; Li & Yu, 2014; Dhrifi, 2015; Sehrawat & Giri, 2016; Jauch & Watzka, 2016). Moreover, some studies have evidenced a linear relation between financial development and income inequality (Shahbaz & Islam, 2011; Tiwari, Shahbaz, & Islam, 2013; Sehrawat & Giri, 2015) and others have stipulated a non-linear relation (Greenwood & Jovanovic, 1990; Zhang & Chen, 2015).

There is extensive literature on the relationship between financial development, economic growth and income inequality, however this relationship remains ambiguous and inconclusive. Beck, Demirguc-Kunt and Levine (2004) attempt to explore the relationship between financial development and income inequality using cross-country analysis. They measure financial development by private credit to GDP. Their findings show that a developing financial sector augments income of low-income group and reduces inequality level.

Clarke et. al. (2006) analysed 83 countries between 1960 to1995. Their results show that a developing financial sector leads to decline in income inequality in the long run. Their findings reject the preposition that financial development only helps the rich and support income inequality reducing impact of financial development. Donou-Adonsou and Sylwester (2016) use a sample of 71 developing countries and cover a period from 2002-2011 to analyse the impact of financial development on poverty reduction. They employ panel fixed-effect 2-SLS technique and find that financial development, as measure by credit to GDP, reduces poverty. Shahbaz, attempted to explore the link between financial development, financial instability and income inequality in Pakistan. Their empirical model suggest that financial development leads to lessen income inequality while financial instability and trade openness worsens it.

Tiwari, Shahbaz and Islam, (2013) examine the impact of financial sector development on rural-urban income inequality in India. Using a time period between 1965 to 2008, their findings conclude that financial development increases income inequality in the long run. Sehrawat and Giri, (2015) also study the relation between financial development income inequality and poverty in South Asian countries between 1990-2013. Their findings also suggest that income inequality impact poverty level. Dhrifi (2015), uses data from 1990 to 2010 to compare countries by income level. His findings suggest that financial development in middle and high-income countries helps in reducing poverty whereas in low-income countries it deteriorates income distribution.

Most recent literature has been focusing on particular themes like financial system liberalization and income inequality, financial system stability and income inequality, financial inclusion and poverty and so on. Among the recent studies, Neaime & Gaysset, (2018) attempt to investigate the impact of financial inclusion on income inequality and poverty. They use ATM per 100,000 adults and Banks per 100,000 adults, as indicators of financial inclusion. Using a sample of 8 MENA countries over the period 2002–2015, their GMM estimates suggest that financial inclusion helps in reduces income inequality but does not significantly impact poverty. Haan, Pleninger, & Sturm (2018) employ a large sample of countries over the period 1975–2005 to test the impact of financial development and financial liberalization on income inequality. Using private credit to GDP as a measure of financial development, their findings suggest income inequality rising effects of financial development. They further find that financial liberalization increases income inequality in countries with highly developed financial system.

Madsen, Islam, & Doucouliagos (2018) cove a long time period of 142 year for a panel of 21 OECD countries over the period 1870–2011. Their results suggest that income inequality harms economic growth in economies where financial systems are underdeveloped. They also find that a moderate level of financial development is necessary for growth as income inequality harms growth less in economies that have moderate to advance level of financial development. Haan & Sturm, (2017) study the impact of between financial development, financial liberalization, bank crisis on income inequality. Using a large sample of 121 counties between 1975–2005, they conclude that finance variables increase income inequality. Their results support that the financial liberalization is conditioned on the level of financial development to impact the income inequality. Further, they conclude that financial liberalization, high level of financial development & crisis in banking sector hamper inequality.

Sehrawat & Giri (2016) investigate the relation between financial development and income inequality in South Asian Association for Regional Cooperation (SAARC) countries. They cover a time period between 1986 to 2012. Their finding suggest that financial development increases income inequality. Jauch & Watzka (2016) cover a sample of 138 developing and developed countries between 1960-2008. Using GMM panel data approach their result found that financial development increases income inequality.

Park & Shin (2017) covered a sample of 162 countries for the period spanning 1960-2011 to investigate the relation between economic growth, financial development and income inequality. This implies that when financial system develops it impacts inequality to decrease, however after reaching a certain threshold financial development starts to aggravate income inequality. This argument is possible to hold for developed countries where financial systems are highly developed and income inequality is significant. Perugini, Hölscher, & Collie (2016) cover a sample of 18 OECD countries over the period 1970–2007 to examine the relationship between income distribution and financial stability. Their evidence suggests a statistically significant positive and robust relationship between income distribution as measure by credit availability to GDP and banking crisis. Their result thus suggests that financial stability leads to more equal distribution of income.

Seven & Coskun, (2016) used a sample of emerging countries to test the relation between financial development, income inequality and poverty. They use both bank-based and market-based measures of financial development. Using GMM statistical technique for their dynamic panel data they find that bank-based financial development deteriorates income inequality and leads to higher level of poverty when poverty is measure by growth of average income of the poorest quantile. Their findings also suggest that stock markets are insignificant to impact income inequality and poverty.

While previously reviewed literature cover just one dimension of financial development at one time in their empirical models, a few recent studies have attempted to consider different dimensions of financial development to study the impact of financial development on income inequality. Rewilak, (2017) draw a sample from developing countries for the period over 2004 to 2015 to test whether financial development is detrimental for poverty. They use four sub-dimensions of bank-based financial development namely access, depth, inefficiency and instability. Their findings suggest that financial access and financial depth contribute to poverty reduction. However, he did not find any direct impact of financial stability and financial inefficiency on poverty.

R. Zhang & Naceur (2018) consider data from 143 countries between 1961 to 2011 to study the impact of financial development on income inequality and poverty. They cover five dimensions of financial institutions and markets development namely access, depth, efficiency, stability, and liberalization. Their instrumental variable regression estimates suggest that four dimensions of financial development namely access, depth, efficiency and stability help in reducing income inequality and poverty. While the financial liberalization is found to increase income inequality and poverty. They also findings suggest that bank based financial development plays a more significant role to influence income distribution than stock market based financial development.

CHAPTER 3

RESEARCH METHODOLOGY

The preceding chapter provides a comprehensive background of this study by reviewing the relevant empirical literature. Based on the literature reviewed this chapter explains the empirical model and the sample and time frame consider for this thesis. We describe the definition of dependent, independent variables and control variables, the sources from where the data is retrieved, and the expected relationship between dependent and independent variables. This chapter also explains the empirical method used to measure the study variables and the explanation for employing such a method.

3.1 Model Specification

We use following model specification to study the impact of bank-based and stock market-based financial development on income inequality in emerging market economies. The equation below represents the general functional form of the empirical model:

$$GINI = f(FD, GDPC, CPI, TO, GCE)$$

where income inequality as measured by Gini coefficient is a function of financial development (FD), GDP per capita (GDPC) and some control variables such as inflation as measure by consumer price index (CPI), trade openness (TO) and government consumption expenditures (GCE).

3.2 Sample and Time Span

To test the empirical model, we consider a sample of 20 advanced emerging and secondary emerging market economies as described by the Financial Times Stock

Exchange (FTSE) classification of equity markets as at September 2018[1]. We cover a time period between 2000 to 2017. The rapid development of financial institutions and markets development serve as engine for the rapid development and growth of economy. This serves as the motivation behind selecting a sample of advanced emerging and secondary emerging market economies, where the relation between rapidly developing financial sector and income inequality can be analyze with more precision.

3.3 Data Description and Sources

3.3.1 Dependent Variable

This study uses GINI coefficient as a proxy for Income inequality. The Gini coefficient is extensively in use in the literature as a standard measure of income inequality. It measures the level of rural poverty in comparison to the urban poverty. It is based on a relative ratio of the areas on the Lorenz curve. Its value ranges between 0 and 1. A value of zero Gini coefficient represents perfect equality, while a value of 1 represents perfect inequality in a country. The data for GINI coefficient is acquire from Standardized World Income Inequality Database (SWIID).

3.3.2 Independent Variables

In order to analyze bank based and stock market based financial development data on four dimensions of financial sector development namely access, depth, efficiency, stability is retrieved from the Global Financial Development Database (GFDD). Each of these dimensions are measured using two proxy measures one related to the development of banking system and the other related to the development of stock markets. The data for financial liberalization as a dimension of financial development is sourced from Chinn-Ito Index.

[1] The sample comprises of advanced emerging countries: Brazil, Czech Republic, Greece, Hungry, Malaysia, Mexico, South Africa, Thailand, Turkey and secondary emerging countries: Chile, China, Colombia, Egypt, India, Indonesia, Pakistan, Peru, Philippines, Qatar and Russia.

Firstly, for the financial access as a measure of financial development, we use number of bank branches per 100,000 adults and value traded in top 10 trading companies to total value traded for bank-based and stock market-based development respectively. The former captures the access to banking services, where it is expected that higher access leads to lesser income inequality or vice versa. The later indicator measures access to stock markets, a large value of value traded in top 10 trading companies indicates less access to financial markets. Secondly, the financial depth as a measure of financial development is measured by two indicators banks' private credit to GDP and the stock market's total value traded to GDP. These measures are widely used as proxies for financial deepening. The indicators are expected to have a negative relation with dependent variable income inequality, since higher values suggests higher banking system and stock market depth that may cause income inequality reducing effect.

Thirdly, the efficiency of financial system is measure by two indicators that are net interest margin and stock market turnover ratio for bank-based and stock markets-based financial development respectively. A higher value of net interest margin suggests less efficiency. Since less efficiency may causes more income inequality therefore, we expect a positive relationship between net internet margin and income inequality. A higher value of stock market turnover ratio as a proxy for stock markets-based financial development represents higher efficiency of financial markets. It is expected that stock markets efficiency reduces income inequality therefore we expect that the relationship between income inequality and stock market turnover ratio is negative.

Fourthly, the financial stability of financial system is measure using two indicators that are ratio of regulatory capital to risk-weighted assets and volatility of stock price index for bank based and stock markets-based financial development respectively. The former indicator represents that a higher level of regulatory capital to risk-weighted assets reduces the probability of bank defaults therefore give stability to financial system. Therefore, we expect a negative relationship between income inequality and regulatory capital to risk-weighted assets. The later indicator represents the stability of stock markets, a higher value of stock price index is indicative of less stability, therefore we expect a positive relationship between income inequality and stock market volatility. Lastly, financial liberalization is measure using Chinn-Ito Index, it takes values between 0 and 1 to measure the degree of capital account openness. The capital account openness helps movement of capital freely and assists in generating business activities this ultimately create job opportunities and help in reducing income inequality. We expect a negative sign for the coefficient of financial liberation in relation to income inequality. The table below summarizes the indicators use to measure different dimensions of bank-based and stock markets-based financial development.

Table 3.1. Summary of study variables and expected signs

Dimensions	**Bank-based financial development**	**Stock market-based financial development**
Access	Bank branches per 100,000 adults; for each country 100,000*reported number of commercial bank branches/adult population in the reporting country. (+)	Value traded excluding top 10 traded companies to total value traded (%) (+)
Depth	Domestic Capital by financial institution to GDP (%) (-)	Stock market's total value traded to GDP (-)
Efficiency	Net interest margin (+)	Stock market turnover ratio (-)
Stability	Ratio of regulatory capital to risk weighted assets (-)	Stock price index volatility (+)
Liberalization	Chinn-Ito Index, that takes values between 0 and 1 to measure the degree of capital account openness. (-)	

The literature on the link between income inequality and economic growth suggests that economic growth has significant impact on income distribution patterns in a country. Therefore, we included GDP per capita, a measure of economic growth, as an independent variable in our empirical model. It is expected that economic growth leads to more employment opportunities and results in reduction in income inequality.

3.3.3 Control Variables

The literature suggests that macro-economic situation, government size and trade policy are important factors that have pronounce impact on income inequality. We control the effect of these three variables in our empirical model. The data for control variables is retrieved from World Development Indicators Database (WDI). Firstly, we use consumer prices' annual that measures percentage change in the cost to the average consumer of acquiring a basket of goods and services as a proxy for macro-economic condition of an economy. The inflation measures the purchase power of general population particularly who belong to the middle- and low-income groups. Therefore, it is observed that inflation deteriorates the income inequality for poor who cannot hedge against the inflationary situation in an economy (Easterly & Fischer, (2001); Shahbaz & Islam, (2011); Jauch & Watzka, (2016)).

Secondly, the government size is measure by consumption expenditure of government as percentage of GDP. Literature suggests that the government size impact income inequality both positively or negatively. If the government expenditure decisions are biased to serve the elites in a society, it will result income inequality to widen (Shahbaz & Islam, 2011). In contrast, if government expenditures are intended to help poor people by means of income redistribute and spending in public goods, it will result in reducing income inequality (Jauch & Watzka, 2016).

Lastly, trade openness that is measured by dividing sum of exports and imports with GDP. The impact of trade openness on income inequality is condition upon the trade policy. If the trade policy is in favour of poor or vice versa. Mostly the developing countries rely on unskilled labour for handicrafts and other traded good, therefore trade openness can help poor and under privileged people (Harrison & McMillan, 2007). Dollar & Aart, (2002) investigated this relationship on a large sample, his finding suggests that trade openness leads to reduction in poverty.

3.4 Econometric Methodology

To choose a suitable econometric methodology for our empirical model we highlight certain characteristics of our empirical model. Firstly, while analyzing the impact of financial development on income inequality. We notice that this relation could be bidirectional. This implies that government efforts to alleviate income inequality can lead to financial development and vice versa. This potential bidirectional relationship raises the problem of endogeneity and can result in potentially biased estimators. Secondly, we also observe that our model is dynamic in nature which means that the dependent variable income inequality has within variation that persist over time. The dependency of dependent variable on its own lag value rises the problem of auto correlation. In this situation the OLS method is not desirable as it produces bias estimates. We further observe that the independent variables such as financial development and economic growth are not strictly exogenous and can be treated as endogenous variables. This implies that the regressors are correlated with the past or possibly current error terms.

Finally, since the panel data usually comprises of heterogenous individual, in this situation the data holds unobserved individual specific effects. This violates the necessary assumption homoscedasticity for OLS estimates. To overcome the potential problems, describe above, a large body of literature on the relationship between income inequality and financial development uses dynamic panel data method. The system GMM estimates are more consistent and efficient, by overcoming the endogeneity problem, and is a better fit for panel studies with fewer time observations.

We employ dynamic panel GMM method, that is proposed by Arellano & Bover (1995) and further developed by Blundell & Bond (1998). This technique helps to control for the potential endogeneity problem, considers unobserved country specific effects and to control for omitted variables bias.

$$GINI_{i,t} = \alpha + \beta_1 LagGINI_{i,t-1} + \beta_2 FD_{i,t} + \gamma_1 GDPC_{i,t} + \gamma_2 X_{i,t} + \mu_i + \vartheta_t + e_{it} \quad (1)$$

In the equation above, $GINI_{i,t}$ is dependent variable; $lagGINI_{i,t}$ is lag of dependent variable $GINI_{i,t}$; $FD_{i,t}$ is a vector of financial development indicators; GDPC is proxy for economic growth; $X_{i,t}$ is a vector of control variables; μ_i is unobserved country-specific fixed effect; ϑ_t is time trend; β and γ are parameters; i is the number of cross-sections; t is the time trend component and e is the error term. The equation (2) below presents a clear explanation of the empirical model.

$$GINI_{i,t} = \alpha + \beta_1 lagGINI_{i,t-1} + \beta_2 FD_{i,t} + \gamma_1 GDPC_{i,t} + \gamma_2 CPI_{i.t} + \gamma_3 Trade_{i,t} + \gamma_{i,t} GCE_{i,t} + \mu_i + \vartheta_t + e_{it} \quad (2)$$

Two assumption are critical to obtain efficient, consistent and unbiased estimators using system GMM. Firstly, to have valid instruments the instrumental variables should not correlated with residual. We use Hansen test of over- identification to the test of validity of instruments. This test evaluates the null hypothesis is that "the instruments are valid". Secondly, the absence of second order autocorrelation. We also use Arellano-Bond test for second order autocorrelation where the null hypothesis tests the absence of second order autocorrelation. The failure to reject null hypothesis for both Hansen test of over-identification and Arellano-Bond test for second order autocorrelation provides support that the instruments created are valid and the data has no second order autocorrelation.

CHAPTER 4

FINDINGS AND DISCUSSION

We use the empirical methodology describe in the preceding chapter to measure the the empirical model. This chapter provides the empirical findings and discusses the empirical results. We use STATA statistical package 14 to run empirical model. Firstly, we present some preliminary statistics such as descriptive statistics and correlations to analyse the properties of our sample dataset. Secondly, we present the system GMM estimators and discuss the main findings in the light of previous literature.

4.1 Descriptive Statistics

To analyse the properties of our sample, we obtain descriptive statistics by using raw data. Descriptive statistics gives useful information about the measure of central tendency and spread or variation in sample dataset which is captured by mean values and standard deviation respectively. The table 4.1 below presents the mean, standard deviation, minimum and maximum values.

In our sample data, the Gini coefficient ranges between 0.24 and 0.59. Since the Gini coefficient ranges between 0 (perfect equality) to 1 (perfect inequality), a mean value of 41.80 shows a moderate level of income inequality in our sample. The standard deviation of Gini is 7.71, this show that over sample countries are not different from each other in terms of income inequality. The mean value for number of bank branches as a measure of bank-based financial access shows that on average 19.12 bank branches are available per 100,000 adults. The sample shows a high variation in terms of financial access to banking system in our sample, it ranges between 3.70 to 257.69 with a standard deviation of 29.58. The value traded in top 10 traded companies to total trade represents access to financial markets where higher value represents less access. The mean value for this indicator is 51.10 and it ranges between 0.17 to 99.24.

This implies that the sample countries are quite diverse in terms of financial market access.

Table 4.1. Descriptive Statistics

Variables	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Gini	323	41.80	7.71	0.24	0.59
Bank Branches per 100,000	249	19.12	29.58	3.70	257.69
Value Traded Top 10 Comp.	268	51.10	22.73	0.17	99.24
Private Credit to GDP	338	55.82	37.62	11.64	149.06
Stock Market Value Traded	350	27.73	30.43	0.22	248.23
Net Interest Margin	339	4.14	1.73	0.99	11.66
Stock Market Turnover Ratio	348	61.36	74.17	0.83	556.91
Regulatory Capital to Risk-weighted Assets	325	14.92	3.03	2.50	30.90
Volatility of Stock Price Index	348	23.00	9.19	7.46	67.97
Financial Liberalization	340	0.54	0.32	0	1
GDP Per Capita	360	11097.15	14047.93	762.31	72671
Trade openness	360	61.53	39.79	17.19	192.12
Consumer Price Index (%)	359	5.49	5.88	-4.86	54.91
Government Consumption Expenditure	360	14.44	4.01	6.53	23.30

Private credit to GDP represents depth of banking system. A higher value of private credit to GDP represents more financial deepening. For this indicator, the sample countries range between 11.64 and 149.06 with standard deviation of 37.62. This shows that some countries in the sample have developed financial institution while others have under develop financial institutions in terms of financial deepening. The stock market value traded to GDP represents the depth of stock markets. The minimum and maximum value for this indicator ranges between 0.22 and 248.23 respectively. The sample countries vary a lot in terms of stock market development as measured by stock market depth.

The net interest margin measures the financial efficiency banking system. Higher value of interest margin represents less efficiency of banking system. The sample countries range between 11.66 and 1.73 with standard deviation of 0.99. The sample does not vary a lot in terms of efficiency of banking system. The stock market turnover ratio measures efficiency of stock markets. The sample varies a lot in terms of stock markets efficiency. The minimum and maximum value of 0.83 and 556.91 respectively. This suggests that some countries have highly efficient stock markets while others have inefficient stock markets.

The regulatory capital to risk weighted assets is used as a measure of financial stability of banking system. Higher value of this indicator suggests more stable banking system. A value of 3.03 for standard deviation implies that the sample countries do not differ a lot in terms of banking system stability. Volatility of the stock price index is used as an indicator of stock markets stability. Higher value of this indicator shows less stability of stock markets. The mean value of this indicator is 23.00 and it ranges between 7.46 and 67.97. We proxy financial liberalization with capital account openness index (KAOPEN) developed by Haan et al. (2018). This index takes values between 0 and 1to measure the degree of capital account openness. The standard deviation is 0.32 and mean value if 0.54.

GDP per capita is a measure of economic growth, the mean value for this indicator is 11097.15 and it ranges between 762.31 and 72671. The standard deviation is 14047.93, this shows that the sample counties vary a lot in terms of economic growth. The trade openness as a measure of trade policy shows has a mean value of trade openness is 61.53 and standard deviation is 39.79. this represent that sample countries vary a lot in terms of their trade policy decision. The mean value and standard deviation of consumer price index and government consumption expenditure shows moderate level of macro-economic stability and government size respectively. The table 4.2 below presents the correlation between variables. The figure 4.1 and 4.2 shows graphically show the state of economic growth, financial liberalization and income inequality in our sample of emerging countries.

Table 4.2. Correlation Matrix

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1. Gini	1													
2. Bank branches	-0.00	1												
3. SM value traded top 10	-0.31	0.25	1											
4. Private credit / GDP	0.12	-0.02	-0.21	1										
5. SM value traded / GDP	0.16	-0.16	-0.50	0.53	1									
6. Net Interest margin	0.17	0.11	0.17	-0.59	-0.36	1								
7. Stock Market turnover	-0.23	-0.10	-0.28	0.14	0.70	-0.09	1							
8. Regulatory capital to Risk-Weighted assets	0.00	0.08	-0.09	-0.33	-0.08	0.41	0.08	1						
9. Stock Market Volatility	-0.19	-0.05	0.29	-0.16	0.08	0.04	0.25	0.14	1					
10. Financial liberalization	-0.41	-0.00	0.52	-0.26	-0.51	0.09	-0.27	-0.34	0.13	1				
11. GDP Per Capita	-0.38	0.13	0.35	0.23	-0.10	-0.16	0.00	-0.18	0.01	0.35	1			
12. Trade Openness	-0.29	-0.17	-0.05	0.34	0.12	-0.33	-0.03	-0.09	-0.30	-0.14	0.01	1		
13. Consumer Price Index (%)	0.03	-0.04	-0.00	-0.35	0.10	-0.00	0.14	0.20	0.26	-0.08	-0.23	-0.25	1	
14. Govt. Consumption Expenditure	-0.18	0.16	0.38	0.48	0.18	-0.26	0.12	-0.23	0.27	0.14	0.53	0.02	-0.10	1

Figure 4.1. Gini Coefficient and GDPC

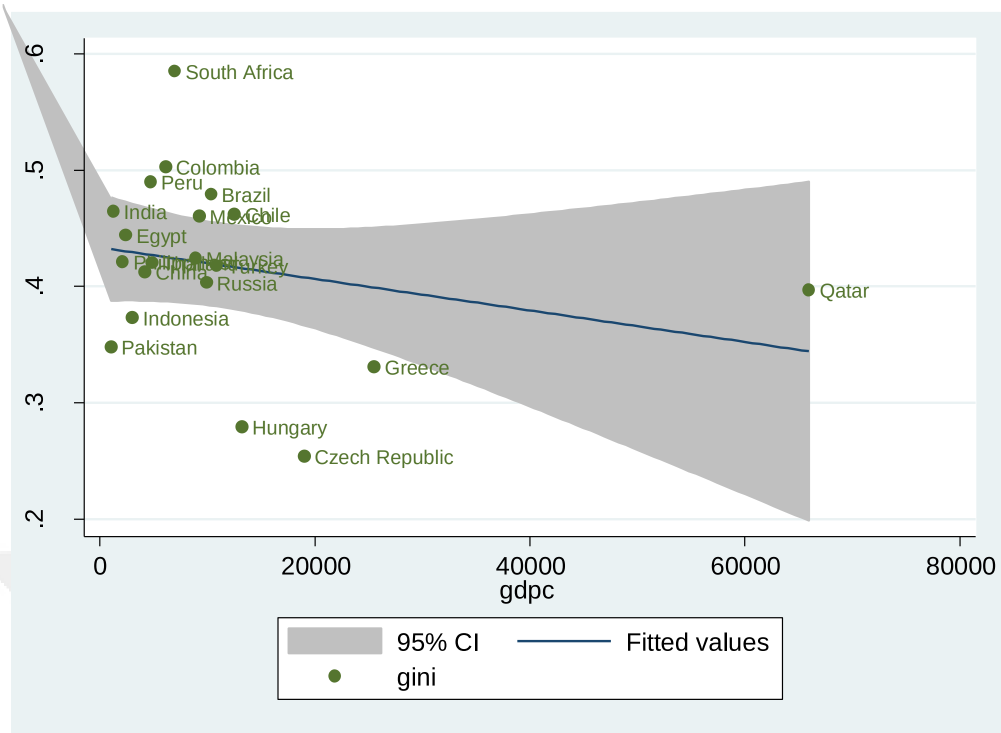
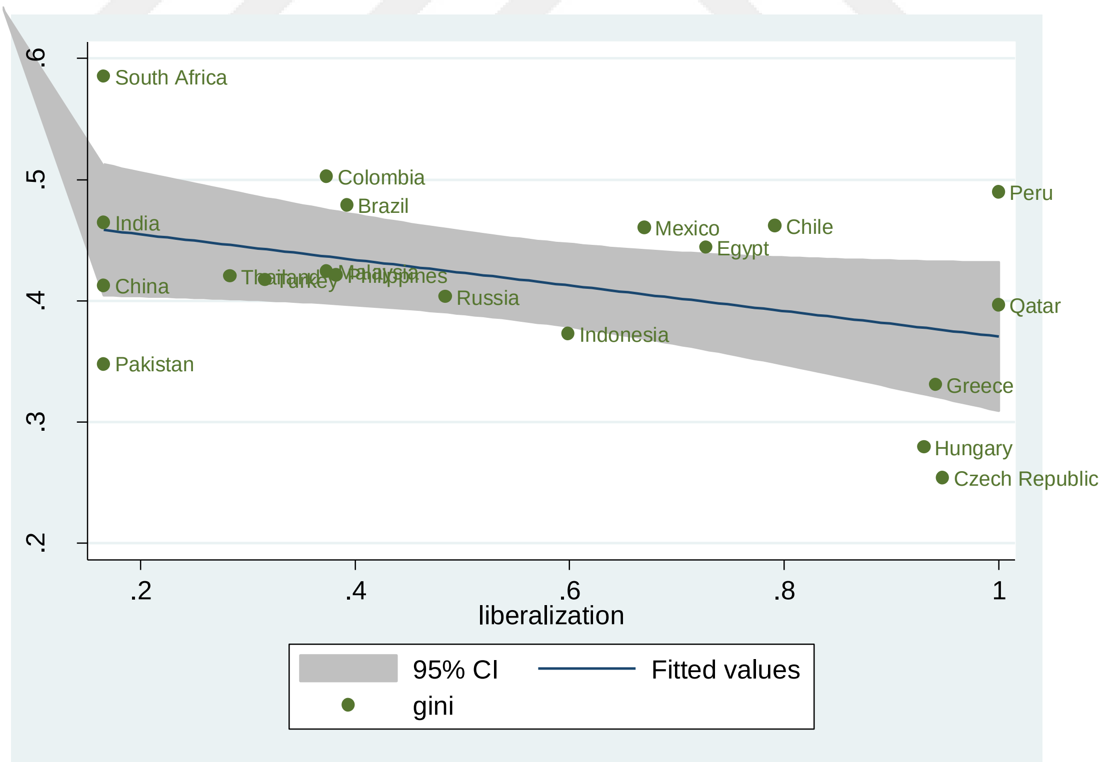


Figure 4.2. Gini Coefficient and Liberalization



4.2 Generalized Method of Moments Estimators

This section presents the results and their explanations. We estimate the parameters of our variables using GMM dynamic panel data method. As describe in the previous chapter, GMM technique has many advantages over OLS and GLS. Since our panel data comprises of advanced emerging and secondary emerging countries, we expect that these countries have heterogenous economic, political and cultural characteristics. We run fixed effect technique to test if our sample has individual country specific and time specific fixed effect. We observe that in our sample of countries there is a country specific fixed effect as the null hypothesis "H_o: Absence of individual effect" can be rejected at 1% level of significance. On the other hand, we do not find support for a time specific fixed effect in our sample as the null hypothesis "H_o: Absence of time effect" cannot be rejected at level of significance.[2]

4.2.1 Financial Development as measure by Financial Access

In this section, we address our first research question that is, 'Does access to banking system and stock markets help in reducing income inequality in advanced emerging and secondary-emerging market economies?'. Financial access is an important dimension of financial development. It is argued that better financial access opportunities lead to higher financial inclusion to the financial system. Different studies use different proxies to measure financial access some have used number of bank branches while other have use number of bank accounts or number of ATMs. In this study we use number of bank branches per 100,000 adults as an indicator of financial access to financial institutions. The data for this indicator is available for most of our sample countries. The table below presents the finding on the relationship between financial development of financial institutions and markets, as measure by financial access, and income inequality.

[2] Please see Appendix B.

Table 4.3. Financial Development as measure by Financial Access

	Bank branches per 100,000 adults		**Value traded top 10 trade companies (%)**	
	I	II	III	IV
ln $GINI_{it-1}$	**0.817*** (0.028)**	**0.7655*** (0.057)**	**0.8786*** (0.0393)**	**0.8032*** (0.0844)**
ln FD_{it}	**0.006* (0.003)**	0.0096 (0.0124)	**-0.0046*** (0.0006)**	**-0.0068*** (0.0017)**
ln $GDPC_{it}$	-0.005 (0.003)	-0.0056 (0.0091)	-0.0074 (0.0036)	0.0009 (0.0030)
ln TO_{it}		-0.0158 (0.0169)		-0.0120 (0.0153)
ln GCE_{it}		-0.0292 (0.0264)		-0.0094 (0.0325)
CPI_{it}		.0000 (0.0003)		0.0001 (0.0003)
Constant	**-0.131 (0.042)****	-0.0450 (0.1373)	-0.0230 (0.0413)	-0.0824 (0.1312)
Observations	231	231	242	242
No of groups	20	20	18	18
No of instruments	17	17	17	17
Individual Effect		Yes		Yes
Time Effect		No		No
F-statistics	317.98 (0.000)	117.53 (0.000)	410.65 (0.000)	77.22 (0.000)
Hansen test	11.99 (0.528)	9.64 (0.472)	10.95 (0.615)	6.74 (0.750)
AR(2)	-1.78 (0.075)	-2.01 0.076	-1.09 (0.277)	-1.08 (0.282)

1. Dependent variable: GINI
2. The standard errors are presented in the parenthesis are standard error, except for F-statistics, Hansen test, and AR(2), which are p-values
3. *, ** and *** indicate 1%, 5% and 10% level of significance respectively.

In the table 4.3 above, the t-statistics for lag Gini as an independent variable is positive and significant at 1% level of significance for all models I-IV. This implies that the income inequality is dependent positively on its lag value. This implies the convergence effect of income inequality and it shows that our model is dynamic.

The model I and II in the table 4.3 above present the relationship between income inequality and access to banking service, as measure by number of bank branches per 100,000 adults. It can be notice that (model I) the relation between access to banking services and income inequality is positive and significant at 10% level of significance.

However, after controlling for the effect of other variables we observe that this relationship has become insignificant.

Our finding is in contract to Mookerjee & Kalipioni, (2010). They use number of bank branches per 100,000 as an indicator of financial access and conclude that greater access to financial system leads to reduction in income inequality. Our finding is also in contrast with the findings of R. Zhang & Naceur (2018)[3], Neaime & Gaysset (2018) Kim (2016) and Par k & Shin (2017) who suggest that access to financial system leads to reduction in income inequality.

Empirical models III and IV in table 4.3 presents the link between income inequality and access to stock markets, as measure by value traded of top 10 traded companies to total trade. We notice that access to stock markets is negative and significant at 1% level of significance. Since a higher value of this indicator suggest less access to stock market for small companies, we expect that less access leads to higher income inequality. We predicted a positive relation between financial market access and income inequality. However, the coefficient of value traded of top 10 traded companies to total trade is negative and significant. This finding is in contract with the finding of R. Zhang & Naceur (2018) who find a positive but insignificant coefficient of value traded of top 10 traded companies to total trade in relation to GINI coefficient.

The f-statistics is significant for all four models presented in table 4.3 above. To check if the GMM estimators are reliable we test whether the instruments are valid and whether our sample suffers from second order serial correlation. To test that the instruments are valid, we use Hansen test of over-identification, where the null hypothesis states that the "instruments are valid and not correlated with residuals". In the table above the p-value of Hansen test is insignificant, this implies that we can not reject the null hypothesis and conclude that the instruments are valid. To test the null hypothesis that 'there is no second order serial correlation', we use Arellano-Bond test. The p-value for Arellano-Bond test for second order serial correlation is insignificant, this implies that we cannot reject the null hypothesis and that there is no second order

[3] In their study R. Zhang & Naceur (2018) used number of bank accounts per 1,000 adults as an indicator of access to financial institution. We also run our model using this proxy measure. Due to data limitation, the GMM considered only 13 countries and represent a positive and insignificant relationship between access to banking system and income inequality. We did not report this result using this indicator due to the reason that the no of instruments outnumbered the no of groups which leads to unreliable estimates.

serial correlation in our sample. In light of the discussion above we conclude that neither the access to banking services nor to stock markets helps in reducing income inequality in our sample.

4.2.2 Financial Development as measure by Financial Depth

In this section, we address our second research question that states, 'Does depth of banking system and stock markets help in reducing income inequality in advanced emerging and secondary emerging market economies' Financial depth and its impact on income inequality is widely studied by previous literature. These studies provide diverse findings; however, this relationship remains inconclusive to date. The table below outlines the results estimated using System GMM on the relationship between financial depth dimension of bank-based and stock market-based financial development and income inequality.

The table 4.4 below presents the relationship between financial depth and income inequality. In model I-IV, the t-statistics of lag Gini as an independent variable is positive and significant at 1% level of significance. This implies that the income inequality is dependent positively on its lag value. This implies that there is convergence effect in income inequality and it shows the dynamic nature of our panel data. The empirical models I and II in the table above present the relationship between income inequality and depth of financial institution, as measure by private capital to GDP. The model I shows that the relation between income inequality and financial depth is positive and insignificant. The GDP per capita is negative and significant at 10%. Colum II represent the link between financial depth and income inequality after by including the control variables to our model. With the inclusion of control variable, the coefficient of private capital to GDP is negative and significant at 5% level of significance. This implies that financial institutions deepening reduces income inequality in emerging market economies.

Table 4.4. Financial Development as measure by Financial Depth

	Private credit to GDP (%)		**Stock market total value traded to GDP (%)**	
	I	II	III	IV
ln $GINI_{it-1}$	**0.8965*** (0.0328)**	**0.7918*** (0.0988)**	**0.8892*** (0.0311)**	**0.8780*** (0.0568)**
ln FD_{it}	0.0000 (0.0035)	**-0.0263** (0.0112)**	**-0.0022*** (0.0005)**	**-0.0023*** (0.0006)**
ln $GDPC_{it}$	**-0.0051* (0.0029)**	**0.0229*** (0.0069)**	-0.0036 (0.0032)	0.0001 (0.0036)
ln TO_{it}		**-0.0224*** (0.0069)**		**-0.0183* (0.0097)**
ln GCE_{it}		0.0074 (0.0177)		-0.0177 (0.0148)
CPI_{it}		**0.0007* (0.0003)**		**0.0003** (0.0001)**
Constant	-0.0461 (0.0360)	**-0.2088** (0.0981)**	**-0.0586* (0.0316)**	0.0176 (0.0508)
Observations	300	300	297	297
No of groups	20	20	20	20
No of instruments	17	17	18	18
Individual effect		Yes		Yes
Time effect		No		No
F-statistics	748.42 (0.000)	42.44 (0.000)	354.36 (0.000)	234.13 (0.000)
Hansen test p-value	9.43 (0.739)	7.33 (0.694)	9.31 (0.811)	7.51 (0.756)
AR(2)	-1.24 (0.217)	-0.88 (0.378)	-1.28 (0.201)	-1.19 (0.233)

1. Dependent variable: GINI
2. The standard errors are presented in the parenthesis are standard error, except for F-statistics, Hansen test, and AR(2), which are p-values
3. *, ** and *** indicate 1%, 5% and 10% level of significance respectively.

Empirical models III and IV in table 4.4 presents the link between income inequality and depth of financial markets, as measure by stock market total value traded to GDP (%). The coefficient of stock market total value traded to GDP (%) is negative and significant at 1% level of significance. Since a higher value of stock market value traded suggest higher depth, a negative coefficient suggest that financial market deepening leads to reduction in income inequality.

The f-statistics is significant for all four models presented in table 4.4. To test validity of instruments, we use Hansen test of over-identification. The null hypothesis states that the “instruments are valid and not correlated with residuals”. In the table above the p-value of Hansen test is insignificant, this implies that we cannot reject the null hypothesis. We therefore conclude that the instruments are valid. To test the null hypothesis that ‘there is no second order serial correlation’, we use Arellano-Bond test. The p-value for Arellano-Bond test for second order serial correlation is insignificant, this implies that we cannot reject the null hypothesis. Hence there is no second order serial correlation in our sample. Our findings are consistent with the findings of R. Zhang & Naceur (2018) who use same indicators to measure the impact of financial system deepening on income inequality.

4.2.3 Financial Development as measure by Financial Efficiency

In this section we test our third research question that states “Does efficiency of banking system and stock markets help in reducing income inequality in advanced emerging and secondary emerging market economies?” This dimension of financial development is rarely touched by the past literature. The table below presents the results on the relationship between income inequality and efficiency of financial institutions and markets as estimated by System GMM.

In empirical models I-IV in table 4.5 below, the t-statistics of lag Gini as an independent variable is positive and statistically significant at 1% level of significance. This implies that the income inequality is dependent positively on its lag value. This implies that there is convergence effect in income inequality, and it shows the dynamic nature of our panel data. In the table above, the model I and II present the relationship between income inequality and efficiency of financial institution, as measure by bank net interest margin. As net interest margin increase it represent less efficiency of financial institution therefore, we expect a positive relation between net interest margin and Gini. The model I shows that the association between income inequality and efficiency of financial institutions is negative and significant at 10% level of significance. The coefficient of GDP per capita is negative and significant at 10%, which shows that economic growth reduces income inequality.

Table 4.5. Financial Development as measure by Financial Efficiency

	Bank net interest margin (%)		**Stock market turnover ratio (%)**	
	I	II	III	IV
ln $GINI_{it-1}$	**0.9092*** (0.0214)**	**0.8974*** (0.0510)**	**0.8824*** (0.0205)**	**.8578*** (0.0535)**
ln FD_{it}	-0.0013 (0.0017)	0.0016 (0.0028)	**-0.0031*** (0.0005)**	**-0.0018** (0.0007)**
ln $GDPC_{it}$	**-0.0041** (0.0019)**	-0.0015 (0.0029)	**-0.0115** (0.0015)**	-0.0026 (0.0037)
ln TO_{it}		**-0.0156** (0.0058)**		**-0.0178** (0.0083)**
ln GCE_{it}		-0.0035 (0.0117)		-0.0157 (0.0120)
CPI_{it}		**0.0003* (0.0001)**		0.0001 (0.0001)
Constant	-0.0406 (0.0273)	-0.0070 (0.0495)	0.0121 (0.0250)	0.0183 (0.0407)
Observations	300	300	295	295
No of groups	20	20	20	20
No of instruments	17	17	18	18
Individual effect		Yes		Yes
Time effect		No		No
F-statistics	1544.66 (0.000)	219.65 (0.000)	705.44 (0.000)	231.61 (0.000)
Hansen test p-value	9.43 (0.740)	9.14 (0.519)	10.09 (0.755)	7.06 (0.794)
AR(2)	-1.25 (0.210)	-1.12 (0.263)	-1.25 (0.210)	-1.08 (0.281)

1. Dependent variable: GINI
2. The standard errors are presented in the parenthesis are standard error, except for F-statistics, Hansen test, and AR(2), which are p-values
3. *, ** and *** indicate 1%, 5% and 10% level of significance respectively.

Model II represent the link between income inequality and efficiency of financial institution after the inclusion of control variables in the model. With the inclusion of control variable, the coefficient of private capital to GDP is positive but insignificant. This implies that efficiency of financial institutions is insignificant to impact income inequality in emerging market economies. This result is in contrast with the findings of R. Zhang & Naceur, (2018) who find a positive and significant association between Gini coefficient and net interest margin. In this model, we also observe that the coefficient of trade openness is negative while the coefficient of CPI is positive and significant at 5% and 10% respectively. This show that using this model the trade policy of government reduces income inequality while macro-economic conditions increases it.

Model III and IV in table 4.5 above present the link between Gini coefficient and efficiency dimension of financial markets, as measure by stock market turnover ratio. The empirical model III show that the coefficient of stock market turnover ratio is negative and significant at 1% level of significance. A higher value of stock market turnover ratio represents more efficient financial market. A negative coefficient implies that income inequality reduces as financial markets' efficiency increases.

We also observe that the coefficient of GDP per capita is negative at 10% level of significance. The empirical model IV in the table above shows that financial markets efficiency is negative and significant at 5% percent level of significance after the inclusion of control variables in to the model. This finding is consistent with the finding of R. Zhang & Naceur (2018), who conclude that efficiency of financial markets leads to reduction in income inequality. In this model we also find that the coefficient of trade openness is negative and significant at 5% level of significance. This implies that trade openness policy reduces income inequality in our sample countries using this model.

The f-statistics is significant for all four models presented in the table 4.5. To test validity of instruments, we use Hansen test of over-identification. The null hypothesis states that the "instruments are valid and not correlated with residuals". In the table above the p-value of Hansen test is insignificant, this implies that we cannot reject the null hypothesis. We therefore conclude that the instruments are valid. To test the null hypothesis that 'there is no second order serial correlation', we use Arellano-Bond test. The p-value for Arellano-Bond test for second order serial correlation is insignificant, this implies that we cannot reject the null hypothesis. Hence there is no second order serial correlation in our sample.

4.2.4 Financial Development as measure by Financial Stability

In this section we address the research question fourth that states, “Does stability of banking system and stock markets help in reducing income inequality in advanced emerging and secondary emerging market economies?” Financial system stability is important factor that hinder equitable distribution of income in an economy. The past studies that used banking crisis as a proxy for financial instability suggest that instability increase income inequality.

The table 4.6 below present the impact of financial system stability on income inequality. we use regulatory capital to risk weighted capital and stock price index volatility as indicator of financial institution and markets’ stability respectively. In empirical models I-IV, the t-statistics of lag Gini as an independent variable is positive and statistically significant at 1% level of significance. This implies that the income inequality is dependent positively on its lag value. This implies that there is convergence effect in income inequality, and it shows the dynamic nature of our panel data.

In the table 4.6, the model I and II present the relationship between income inequality and stability of financial institution. In model I and II, observe that the coefficient of regulatory capital to risk weighted assets is insignificant. The model I shows that the association between income inequality and efficiency of financial institutions is negative and significant at 10% level of significance. The coefficient of GDP per capita is negative and significant at 10%, which shows that economic growth reduces income inequality.

The empirical model II represents the link between income inequality and efficiency of financial institution after the inclusion of control variables in the model. With the inclusion of control variable, the coefficient of private capital to GDP is positive but insignificant. This implies that efficiency of financial institutions is insignificant to impact income inequality in emerging market economies. This result is in contrast with the findings of R. Zhang & Naceur (2018), who find a positive and significant association between Gini coefficient and net interest margin. In this model, we also observe that the coefficient of trade openness is negative while the coefficient of CPI is positive and significant at 5% and 10% respectively. This show that using this model the trade policy of government reduces income inequality while macro-economic conditions increases it.

Table 4.6. Financial Development as measure by Financial Stability

	Bank regulatory capital to risk-weighted assets (%)		**Stock price volatility**	
	I	II	III	IV
ln $GINI_{it-1}$	**0.8952*** (0.0457)**	**0.8836*** (0.0712)**	**0.908*** (0.022)**	**0.892*** (0.0457)**
ln FD_{it}	0.0126 (0.0088)	0.0201 (0.0156)	0.0002 (0.0003)	**0.0026* (0.0014)**
ln $GDPC_{it}$	-0.0082 (0.0048)	-0.0011 (0.0074)	**-0.0035** (0.0025)**	**-0.0061* (0.0033)**
ln TO_{it}		**-0.0252** (0.0083)**		**-0.0136** (0.0063)**
Ln GCE_{it}		**-0.0341** (0.0139)**		0.0060 (0.0136)
CPI_{it}		**0.0003** (0.0001)**		**0.0005** (0.0002)**
Constant	-0.0555 (0.0482)	**0.0384 (0.0936)**	**-0.0504** (0.0211)**	0.0036 (0.0490)
Observations	290	290	294	294
No of groups	20	20	20	20
No of instruments	17	17	18	18
Individual effect		Yes		Yes
Time effect		No		No
F-statistics	466.7 (0.000)	43.65 (0.000)	781.20 (0.000)	121.29 (0.000)
Hansen test p-value	10.89 (0.620)	6.04 (0.812)	10.82 (0.700)	9.63 (0.564)
AR(2)	-1.04 (0.300)	-0.81 (0.416)	-1.22 (0.222)	-1.25 (0.212)

1. Dependent variable: GINI
2. The standard errors are presented in the parenthesis are standard error, except for F-statistics, Hansen test, and AR(2), which are p-values
3. *, ** and *** indicate 1%, 5% and 10% level of significance respectively.

Model III and IV present the link between Gini coefficient and efficiency dimension of financial markets, as measure by stock market turnover ratio. The empirical model III show that the coefficient of stock market turnover ratio is negative and significant at 1% level of significance. A higher value of stock market turnover ratio represents more efficient financial market. A negative coefficient implies that income inequality reduces as financial markets' efficiency increases.

We also observe that the coefficient of GDP per capita is negative at 10% level of significance. The empirical model IV in the table above shows that financial markets efficiency is negative and significant at 5% percent level of significance after the inclusion of control variables in to the model. This finding is consistent with the finding of R. Zhang & Naceur (2018), who conclude that efficiency of financial markets leads to reduction in income inequality. In this model we also find that the coefficient of trade openness is negative and significant at 5% level of significance. This implies that trade openness policy reduces income inequality in our sample countries using this model.

The f-statistics is significant for all four models presented in the table 4.6 above. To test validity of instruments, we use Hansen test of over-identification. The null hypothesis states that the "instruments are valid and not correlated with residuals". In the table above the p-value of Hansen test is insignificant, this implies that we cannot reject the null hypothesis. We therefore conclude that the instruments are valid. To test the null hypothesis that 'there is no second order serial correlation', we use Arellano-Bond test. The p-value for Arellano-Bond test for second order serial correlation is insignificant, this implies that we cannot reject the null hypothesis. Hence there is no second order serial correlation in our sample.

4.2.5 Financial Development as measure by Financial liberalization

Under this heading we test our fifth and final research question that is "Does financial liberalization reduces income inequality in advance emerging and secondary emerging countries?". The literature on the role of financial liberalization to influence income inequality suggest favourable outcome. We expect a negative sign for the coefficient of financial liberalization in relation to Gini coefficient. The table 4.7 below present system GMM estimates.

Table 4.7. Financial Development as measure by Financial Liberalization

Variables	Financial liberalization	
	I	**II**
ln $GINI_{it-1}$	**0.8778*** (0.0221)**	**0.9192*** (0.0300)**
ln FD_{it}	**-0.0124** (0.0043)**	**-0.0106** (0.0038)**
ln $GDPC_{it}$	**-0.0065*** (0.0018)**	**-0.0069** (0.0025)**
ln GCE_{it}		0.0064 (0.0102)
CPI_{it}		0.0002 (0.0002)
Constant	-0.0417 (0.0278)	-0.0211 (0.0388)
Observations	301	301
No of groups	20	20
No of instruments	17	17
Individual effect	Yes	Yes
Time effect	No	No
F-statistics	586.46 (0.000)	372.62 (0.000)
Hansen test p-value	8.88 (0.782)	10.45 (0.490)
AR(2)	-1.25 (0.211)	-1.31 (0.189)

1.Dependent variable: GINI
2. The standard errors are presented in the parenthesis are standard error, except for F-statistics, Hansen test, and AR(2), which are p-values
3. *, ** and *** indicate 1%, 5% and 10% level of significance respectively.

In consistent with all previous models, the lag Gini, in empirical model I-IV in the table 4.7 above, is positive and statistically significant to explain the dependent variable Gini. This implies that the income inequality is dependent on its lag value, and there a is convergence effect in income inequality. This also shows the dynamic nature of our panel data.

In the table 4.7 above, the empirical model I and II present the relationship between income inequality and financial liberalization as measure by financial accounts openness. This measure takes value between 0 and 1 to explain the level of financial accounts openness. The model I shows that the association between income inequality and financial liberalization is negative and significant at 5% level of significance. The coefficient of GDP per capita is negative and significant at 10%.

Model II represent the link between income inequality and efficiency of financial institution with the inclusion of control variables in the model. The coefficient of financial liberalization is negative and significant at 5% level of significance. We also observe that the coefficient of GDP per capita is negative and significant at 5% level of significant. These finding imply that financial liberalization and economic growth reduces income inequality in our sample emerging market economies. This finding is consistent with the finding of Bumann & Lensink (2016) and Haan & Sturm, (2017a).

CHAPTER 5

CONCLUSION

Many theories suggest that financial development can bring array of benefits to economies such as boosting economic growth and welfare in the long run. The empirical literature has also well documented the positive effect of financial development on economic growth and income inequality reduction. However, what are the important channels through which these benefits can be achieve is a subject of concern. This study aims to fill this gap through a comprehensive study of analysing different dimensions of financial development that are critical for achieving welfare in society by reducing income inequality. We study the impact of financial development on income inequality, by covering five bank-based and market-based dimensions of financial development that are access, depth, efficiency, stability, and liberalization. We use a panel of 20 advanced emerging and secondary emerging countries for the time period between 2000-2017.

We use Generalized Method of Moments (GMM) dynamic panel data approach to estimate our empirical model. Our findings suggest that depth of banking system is negatively and significantly related with Gini coefficient. This suggest income inequality reducing effect of depth of banking system on income inequality. Our findings do not find support for the hypothesis that financial access, efficiency, and stability of banking system is not significant to impact income inequality. On the other hand, our findings suggest that stock market depth, efficiently and stability play significant and effective role in alleviating income inequality. We also find that capital account openness as a measure of financial liberalization is associated with significant decrease in income inequality. We conclude that in our sample of emerging countries stock market-based financial development plays a more significant and persistent role in abridging income inequality than the bank-based financial development.

We suggest that the policy makers in emerging countries should focus on devising policies related to banking system and stock markets that benefit poor segment of society more than the rich. To attain welfare by means of reducing income discrepancy the access, depth, efficiency and stability of banking system and stock markets must be ensure. Governments in emerging countries should encourage financial account liberalization to reap the benefit of financial development for reducing income disparities among various segment of societies.

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APPENDIXES

APPENDIX A

Mean values of variables by countries

Countries	Gini	GDPC	TO	CPI	GCE	liberalization
Brazil	0.48	10344.95	20.20	6.84	19.12	0.39
Chile	0.46	12485.71	56.60	3.23	11.94	0.79
China	0.41	4174.17	46.93	2.20	14.09	0.17
Colombia	0.50	6108.37	29.08	5.18	14.56	0.37
Czech Republic	0.25	19007.53	127.43	2.21	20.17	0.95
Egypt	0.44	2378.25	32.33	9.84	11.63	0.73
Greece	0.33	25503.34	34.40	2.08	20.34	0.94
Hungary	0.28	13177.55	135.64	4.44	21.05	0.93
India	0.47	1258.90	31.41	6.48	10.93	0.17
Indonesia	0.37	3003.24	45.39	6.99	8.60	0.60
Malaysia	0.42	8907.76	154.04	2.32	12.45	0.37
Mexico	0.46	9235.69	56.13	4.62	11.18	0.67
Pakistan	0.35	1019.44	30.37	7.80	9.80	0.17
Peru	0.49	4692.36	39.42	2.81	11.54	1.00
Philippines	0.42	2098.46	67.22	3.84	10.22	0.38
Russia	0.40	9899.73	44.08	11.16	17.72	0.48
South Africa	0.59	6964.73	52.26	5.41	19.55	0.17
Thailand	0.42	4809.77	109.80	2.15	14.98	0.28
Turkey	0.42	10883.69	40.07	16.37	13.64	0.32
Qatar	0.40	65959.06	77.95	4.06	15.27	1.00

All variables are averaged over the period 2000-2017.

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
gini	323	.4180991	.0771025	.249	.591
bankbranches	249	19.12871	29.58774	3.70927	257.696
top10traded	268	51.10371	22.73475	.1758	99.24805
pc_gdp	338	55.8254	37.62027	11.6472	149.06
sm_valuetr~d	350	27.73312	30.43509	.22163	248.231
interest_m~n	339	4.146938	1.73269	.992108	11.6639
sm_turnover	348	61.36723	74.1743	.838975	556.912
regcaptori~t	325	14.92559	3.030728	2.5	30.9
sm_volatil~y	348	23.00027	9.191466	7.46304	67.9755
liberaliza~n	340	.5437114	.3292979	0	1
gdpc	360	11097.15	14047.93	762.313	72671
to	360	61.53218	39.79283	17.19666	192.1234
cpi	359	5.495135	5.881684	-4.863278	54.91537
gce	360	14.44212	4.016724	6.531995	23.30901

Correlations

	gini	bankbr~s	top10t~d	pc_gdp	sm_val~d	intere~n	sm_tur~r	regcap~t	sm_vol~y	libera~n	gdpc	to	cpi	gce
gini	1.0000													
bankbranches	-0.0019	1.0000												
top10traded	-0.3187	0.2545	1.0000											
pc_gdp	0.1227	-0.0279	-0.2141	1.0000										
sm_valuetr~d	0.1637	-0.1680	-0.5022	0.5330	1.0000									
interest_m~n	0.1731	0.1192	0.1781	-0.5982	-0.3639	1.0000								
sm_turnover	-0.2300	-0.1077	-0.2895	0.1462	0.7088	-0.0999	1.0000							
regcaptori~t	0.0018	0.0859	-0.0903	-0.3347	-0.0863	0.4106	0.0868	1.0000						
sm_volatil~y	-0.1975	-0.0522	0.2965	-0.1687	0.0802	0.0406	0.2500	0.1434	1.0000					
liberaliza~n	-0.4167	-0.0064	0.5240	-0.2653	-0.5118	0.0982	-0.2756	-0.3405	0.1329	1.0000				
gdpc	-0.3829	0.1332	0.3502	0.2385	-0.1045	-0.1652	0.0097	-0.1883	0.0171	0.4010	1.0000			
to	-0.2974	-0.1761	-0.0502	0.3473	0.1258	-0.3339	-0.0386	-0.0908	-0.3040	-0.0162	0.0191	1.0000		
cpi	0.0376	-0.0417	-0.0075	-0.3535	0.1074	-0.0095	0.1435	0.2003	0.2697	-0.0899	-0.2379	-0.2567	1.0000	
gce	-0.1878	0.1635	0.3848	0.4836	0.1818	-0.2661	0.1247	-0.2304	0.2740	0.0881	0.5370	0.0257	-0.1081	1.0000

APPENDIX B

Generalised Least Square Fixed-effect Estimates

```
. xtreg lngini lnbankbranches lngdpc lnto cpi lngce, fe //FI access

Fixed-effects (within) regression               Number of obs     =        231
Group variable: id                              Number of groups  =         20

R-sq:                                           Obs per group:
     within  = 0.2448                                         min =          4
     between = 0.1201                                         avg =       11.6
     overall = 0.1443                                         max =         13

                                                F(5,206)          =      13.35
corr(u_i, Xb)  = -0.1505                        Prob > F          =     0.0000
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnbankbranches	-.0067868	.0054442	-1.25	0.214	-.0175203	.0039467
lngdpc	-.0863186	.0173232	-4.98	0.000	-.1204722	-.0521651
lnto	-.03134	.0124688	-2.51	0.013	-.0559229	-.0067571
cpi	-.0004165	.0005894	-0.71	0.481	-.0015785	.0007456
lngce	-.0586294	.0247525	-2.37	0.019	-.10743	-.0098288
_cons	.1685687	.1684298	1.00	0.318	-.1634986	.5006359
sigma_u	.187468					
sigma_e	.02183536					
rho	.98661512	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(19, 206) = 681.52                   Prob > F = 0.0000

. fetests lngini lnbankbranches lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(29.55,195.45)   =  424.24
ProbFH01 =         0.0000

 H02: Absence of individual  effects
FH02(19,195.45)   =  654.25
ProbFH02 =         0.0000

 H03: Absence of time  effects
FH03(10.55,195.45)   =    0.37
ProbFH03 =         0.9622
```

```
. xtreg lngini lntop10traded lngdpc lnto cpi lngce, fe //FM access

Fixed-effects (within) regression               Number of obs     =        253
Group variable: id                              Number of groups  =         18

R-sq:                                           Obs per group:
     within  = 0.1773                                         min =          1
     between = 0.1396                                         avg =       14.1
     overall = 0.1284                                         max =         17

                                                F(5,230)          =       9.91
corr(u_i, Xb)  = -0.0053                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
lntop10traded |  -.0030398   .0038843    -0.78   0.435    -.0106931    .0046134
      lngdpc |  -.0641768   .0111505    -5.76   0.000     -.086147   -.0422066
        lnto |  -.0324373   .0117578    -2.76   0.006    -.0556041   -.0092705
         cpi |   .0007087   .0003986     1.78   0.077    -.0000766    .0014941
       lngce |  -.0192738   .0282236    -0.68   0.495    -.0748837    .0363361
       _cons |  -.1018994   .1316333    -0.77   0.440    -.3612608    .1574619
-------------+----------------------------------------------------------------
     sigma_u |  .15201889
     sigma_e |  .02912543
         rho |  .96459265   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(17, 230) = 370.52                   Prob > F = 0.0000

. fetests lngini lntop10traded lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(30.05555555555556,216.9444444444445)  =  209.56
ProbFH01 =         0.0000

 H02: Absence of individual  effects
FH02(17,216.9444444444445)  =  368.01
ProbFH02 =         0.0000

 H03: Absence of time  effects
FH03(13.05555555555556,216.9444444444445)  =    0.96
ProbFH03 =         0.4883
```

```
Fixed-effects (within) regression               Number of obs     =        319
Group variable: id                              Number of groups  =         20

R-sq:                                           Obs per group:
     within  = 0.2537                                         min =         12
     between = 0.0010                                         avg =       15.9
     overall = 0.0002                                         max =         17

                                                F(5,294)          =      19.99
corr(u_i, Xb)  = -0.1628                        Prob > F          =     0.0000
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnpc_gdp	-.0461722	.0071263	-6.48	0.000	-.0601972	-.0321471
lngdpc	-.0192252	.0105159	-1.83	0.069	-.0399212	.0014707
lnto	.0018532	.0096668	0.19	0.848	-.0171717	.0208781
cpi	.0001718	.0003521	0.49	0.626	-.0005212	.0008647
lngce	.0237561	.0220515	1.08	0.282	-.0196426	.0671549
_cons	-.6173633	.1121405	-5.51	0.000	-.8380631	-.3966635
sigma_u	.20080822					
sigma_e	.02698993					
rho	.98225545	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(19, 294) = 561.77                  Prob > F = 0.0000

. fetests lngini lnpc_gdp lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(33.95,279.05)   =  299.35
ProbFH01 =         0.0000

 H02: Absence of individual  effects
FH02(19,279.05)  =  518.78
ProbFH02 =         0.0000

 H03: Absence of time  effects
FH03(14.95,279.05)   =    0.06
ProbFH03 =         1.0000
```

```
. xtreg lngini lnsm_valuetrade lngdpc lnto cpi lngce, fe //FM depth

Fixed-effects (within) regression               Number of obs     =        316
Group variable: id                              Number of groups  =         20

R-sq:                                           Obs per group:
     within  = 0.1418                                         min =          9
     between = 0.0896                                         avg =       15.8
     overall = 0.0992                                         max =         18

                                                F(5,291)          =       9.62
corr(u_i, Xb)  = 0.0223                         Prob > F          =     0.0000
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsm_valuetraded	-.001506	.0029529	-0.51	0.610	-.0073178	.0043058
lngdpc	-.0515934	.0105457	-4.89	0.000	-.0723489	-.030838
lnto	-.0124922	.0103901	-1.20	0.230	-.0329414	.0079571
cpi	.0009766	.0003608	2.71	0.007	.0002665	.0016866
lngce	-.024076	.0238186	-1.01	0.313	-.0709546	.0228027
_cons	-.324129	.1127313	-2.88	0.004	-.5460011	-.1022569
sigma_u	.18764306					
sigma_e	.02948599					
rho	.97590245	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(19, 291) = 545.34                   Prob > F = 0.0000

. fetests lngini lnsm_valuetrade lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(33.8,276.2)   =  303.15
ProbFH01 =         0.0000

 H02: Absence of individual  effects
FH02(19,276.2)   =  537.35
ProbFH02 =         0.0000

 H03: Absence of time  effects
FH03(14.8,276.2)   =    0.76
ProbFH03 =         0.7194
```

```
. xtreg lngini lninterest_margin lngdpc lnto cpi lngce, fe //FI efficiency

Fixed-effects (within) regression               Number of obs      =       320
Group variable: id                              Number of groups   =        20

R-sq:                                           Obs per group:
     within  = 0.1824                                         min =         13
     between = 0.0965                                         avg =       16.0
     overall = 0.1105                                         max =         17

                                                F(5,295)           =     13.16
corr(u_i, Xb)  = 0.0224                         Prob > F           =    0.0000

------------------------------------------------------------------------------------
           lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------+-----------------------------------------------------------------
lninterest_margin |   .0219982   .0061713     3.56   0.000     .0098527    .0341436
           lngdpc |  -.0553143   .0093709    -5.90   0.000    -.0737567   -.036872
             lnto |  -.0066402   .0099157    -0.67   0.504    -.0261547    .0128742
              cpi |   .0008335   .0003466     2.40   0.017     .0001513    .0015156
            lngce |  -.0161553   .0207105    -0.78   0.436    -.0569145    .0246038
            _cons |  -.3691592   .1067395    -3.46   0.001    -.5792265   -.1590918
------------------+-----------------------------------------------------------------
          sigma_u |  .18731078
          sigma_e |  .02820206
              rho |  .97783331   (fraction of variance due to u_i)
------------------------------------------------------------------------------------
F test that all u_i=0: F(19, 295) = 598.52                   Prob > F = 0.0000

. fetests lngini lninterest_margin lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(34,280)   =   322.95
ProbFH01 =         0.0000

 H02: Absence of individual  effects
FH02(19,280)   =   573.91
ProbFH02 =         0.0000

 H03: Absence of time  effects
FH03(15,280)   =     0.31
ProbFH03 =         0.9938
```

```
. xtreg lngini lnsm_turnover lngdpc lnto cpi lngce, fe //FM efficiency

Fixed-effects (within) regression               Number of obs     =        313
Group variable: id                              Number of groups  =         20

R-sq:                                           Obs per group:
     within  = 0.1512                                         min =          9
     between = 0.1175                                         avg =       15.7
     overall = 0.1207                                         max =         18

                                                F(5,288)          =      10.26
corr(u_i, Xb)  = 0.0399                         Prob > F          =     0.0000

------------------------------------------------------------------------------
       lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+----------------------------------------------------------------
lnsm_turnover |  -.0069971   .0034342    -2.04   0.043    -.0137563   -.0002379
       lngdpc |  -.0515591   .0096815    -5.33   0.000    -.0706145   -.0325036
         lnto |  -.0136648   .0103709    -1.32   0.189    -.0340771    .0067475
          cpi |   .0009419   .0003565     2.64   0.009     .0002402    .0016437
        lngce |  -.0363163   .0242858    -1.50   0.136    -.0841166    .0114839
        _cons |  -.2645366   .1152725    -2.29   0.022      -.49142   -.0376533
--------------+----------------------------------------------------------------
      sigma_u |  .18453191
      sigma_e |  .02910607
          rho |  .97572542   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(19, 288) = 479.01                   Prob > F = 0.0000

. fetests lngini lnsm_turnover lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(33.65,273.35)  =  268.93
ProbFH01 =        0.0000

 H02: Absence of individual  effects
FH02(19,273.35)  =  469.50
ProbFH02 =        0.0000

 H03: Absence of time  effects
FH03(14.65,273.35)  =    0.86
ProbFH03 =        0.6067
```

```
. xtreg lngini lnregcaptoriskasset lngdpc lnto cpi lngce, fe //FI stability

Fixed-effects (within) regression               Number of obs     =        308
Group variable: id                              Number of groups  =         20

R-sq:                                           Obs per group:
     within  = 0.2102                                         min =          6
     between = 0.0747                                         avg =       15.4
     overall = 0.0968                                         max =         17

                                                F(5,283)          =      15.07
corr(u_i, Xb)  = -0.0908                        Prob > F          =     0.0000

------------------------------------------------------------------------------------
             lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------------+---------------------------------------------------------------
lnregcaptoriskasset |   .0126369   .0105981     1.19   0.234    -.0082242    .0334979
             lngdpc |  -.0845437   .0113489    -7.45   0.000    -.1068826   -.0622048
               lnto |  -.0114132   .0100181    -1.14   0.256    -.0311326    .0083063
                cpi |   .0008376   .0003518     2.38   0.018     .0001452      .00153
              lngce |   .0115197   .0233469     0.49   0.622     -.034436    .0574754
              _cons |  -.1729834   .1114337    -1.55   0.122    -.3923274    .0463607
--------------------+---------------------------------------------------------------
            sigma_u |  .19281288
            sigma_e |    .028124
                rho |   .9791676   (fraction of variance due to u_i)
------------------------------------------------------------------------------------
F test that all u_i=0: F(19, 283) = 611.60                   Prob > F = 0.0000

. fetests lngini lnregcaptoriskasset lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(33.4,268.6)  =  337.53
ProbFH01 =        0.0000

 H02: Absence of individual  effects
FH02(19,268.6)  =  588.73
ProbFH02 =        0.0000

 H03: Absence of time  effects
FH03(14.4,268.6)  =    0.40
ProbFH03 =        0.9750
```

```
. xtreg lngini lnsm_volatility lngdpc lnto cpi lngce, fe //FM stability

Fixed-effects (within) regression               Number of obs     =        312
Group variable: id                              Number of groups  =         20

R-sq:                                           Obs per group:
     within  = 0.1276                                         min =          6
     between = 0.0880                                         avg =       15.6
     overall = 0.1084                                         max =         18

                                                F(5,287)          =       8.40
corr(u_i, Xb)  = 0.0696                         Prob > F          =     0.0000

------------------------------------------------------------------------------
         lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
----------------+-------------------------------------------------------------
lnsm_volatility |   .0015084   .0062013     0.24   0.808    -.0106975    .0137142
         lngdpc |  -.0481748   .0101191    -4.76   0.000    -.0680917   -.0282578
           lnto |  -.0110706   .0102213    -1.08   0.280    -.0311888    .0090476
            cpi |   .0009724   .0003707     2.62   0.009     .0002427     .001702
          lngce |  -.0197586   .0238034    -0.83   0.407    -.0666101    .0270928
          _cons |  -.3848411   .1202574    -3.20   0.002    -.6215395   -.1481427
----------------+-------------------------------------------------------------
        sigma_u |  .18775946
        sigma_e |  .02915666
            rho |  .97645365   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(19, 287) = 539.37                   Prob > F = 0.0000

. fetests lngini lnsm_volatility lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(33.6,272.4)  =  303.15
ProbFH01 =        0.0000

 H02: Absence of individual  effects
FH02(19,272.4)  =  513.42
ProbFH02 =        0.0000

 H03: Absence of time  effects
FH03(14.6,272.4)  =   0.86
ProbFH03 =        0.6108
```

```
. xtreg lngini liberalization lngdpc lnto cpi lngce, fe //Financial liberalization

Fixed-effects (within) regression               Number of obs      =       321
Group variable: id                              Number of groups   =        20

R-sq:                                           Obs per group:
     within  = 0.2250                                         min =        13
     between = 0.1119                                         avg =      16.1
     overall = 0.1300                                         max =        17

                                                F(5,296)           =     17.19
corr(u_i, Xb)  = -0.0066                        Prob > F           =    0.0000

------------------------------------------------------------------------------
      lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
liberalization |  -.0659372   .0121095    -5.45   0.000    -.0897689   -.0421055
      lngdpc |  -.0523988   .0091146    -5.75   0.000    -.0703364   -.0344613
        lnto |   .0001506   .0097731     0.02   0.988     -.019083    .0193841
         cpi |   .0005663    .000343     1.65   0.100    -.0001088    .0012415
       lngce |  -.0344018   .0201451    -1.71   0.089    -.0740475     .005244
       _cons |  -.3063771   .1027476    -2.98   0.003    -.5085855   -.1041687
-------------+----------------------------------------------------------------
     sigma_u |  .18589745
     sigma_e |  .02741478
         rho |  .97871475   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(19, 296) = 532.70                   Prob > F = 0.0000
```

```
. fetests lngini liberalization lngdpc lnto cpi lngce
       panel variable:  id (strongly balanced)
        time variable:  year, 2000 to 2017
                delta:  1 unit

 Fixed Effects Testing

 H01: Absence of individual and time effects
FH01(34.05,280.95)   =  301.11
ProbFH01 =        0.0000

 H02: Absence of individual  effects
FH02(19,280.95)   =  529.33
ProbFH02 =        0.0000

 H03: Absence of time  effects
FH03(15.05,280.95)   =    1.22
ProbFH03 =        0.2552
```

APPENDIX C

Generalized Method of Moments Estimate

Dynamic panel-data estimation, two-step system GMM

Group variable: id	Number of obs = 231
Time variable : year	Number of groups = 20
Number of instruments = 17	Obs per group: min = 4
F(3, 19) = 317.98	avg = 11.55
Prob > F = 0.000	max = 13

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
lngini						
L1.	.8170811	.0283763	28.79	0.000	.7576888	.8764735
lnbankbranches	.0066882	.0035202	1.90	0.073	-.0006797	.014056
lngdpc	-.005479	.0039187	-1.40	0.178	-.0136809	.0027228
_cons	-.1318709	.042509	-3.10	0.006	-.2208432	-.0428986

Arellano-Bond test for AR(1) in first differences: z = -1.34 Pr > z = 0.181
Arellano-Bond test for AR(2) in first differences: z = -1.78 Pr > z = 0.075

Sargan test of overid. restrictions: chi2(13) = 13.30 Prob > chi2 = 0.425
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(13) = 11.99 Prob > chi2 = 0.528
(Robust, but weakened by many instruments.)

Dynamic panel-data estimation, two-step system GMM

Group variable: id	Number of obs = 231
Time variable : year	Number of groups = 20
Number of instruments = 17	Obs per group: min = 4
F(6, 19) = 117.53	avg = 11.55
Prob > F = 0.000	max = 13

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
lngini						
L1.	.7655433	.057125	13.40	0.000	.6459792	.8851074
lnbankbranches	.0096529	.0124956	0.77	0.449	-.0165006	.0358065
lngdpc	-.0056549	.0091053	-0.62	0.542	-.0247125	.0134028
lnto	-.0158399	.0169147	-0.94	0.361	-.0512428	.019563
cpi	.0000264	.0003669	0.07	0.943	-.0007416	.0007944
lngce	-.029247	.0264605	-1.11	0.283	-.0846296	.0261355
_cons	-.0450972	.1373909	-0.33	0.746	-.3326597	.2424653

```
Arellano-Bond test for AR(1) in first differences: z =  -1.33  Pr > z =  0.184
Arellano-Bond test for AR(2) in first differences: z =  -2.01  Pr > z =  0.076

Sargan test of overid. restrictions: chi2(10)    =   9.76  Prob > chi2 =  0.461
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(10)    =   9.64  Prob > chi2 =  0.472
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM

Group variable: id                              Number of obs      =       242
Time variable : year                            Number of groups   =        18
Number of instruments = 17                      Obs per group: min =         1
F(3, 17)      =    410.65                                      avg =     13.44
Prob > F      =     0.000                                      max =        16
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.8786826	.0393454	22.33	0.000	.795671	.9616941
lntop10traded	-.0046695	.0006318	-7.39	0.000	-.0060025	-.0033364
lngdpc	-.0074256	.0036103	-2.06	0.055	-.0150426	.0001915
_cons	-.0230009	.0413053	-0.56	0.585	-.1101474	.0641456

```
Arellano-Bond test for AR(1) in first differences: z =  -2.22  Pr > z =  0.026
Arellano-Bond test for AR(2) in first differences: z =  -1.09  Pr > z =  0.277

Sargan test of overid. restrictions: chi2(13)    =  13.12  Prob > chi2 =  0.439
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(13)    =  10.95  Prob > chi2 =  0.615
  (Robust, but weakened by many instruments.)
```

Dynamic panel-data estimation, two-step system GMM

Group variable: id	Number of obs = 242
Time variable : year	Number of groups = 18
Number of instruments = 17	Obs per group: min = 1
F(6, 17) = 77.22	avg = 13.44
Prob > F = 0.000	max = 16

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.8032062	.0844182	9.51	0.000	.6250993	.9813131
lntop10traded	-.0068904	.0017355	-3.97	0.001	-.0105521	-.0032288
lngdpc	.0009907	.0030624	0.32	0.750	-.0054704	.0074517
lnto	-.012024	.0153393	-0.78	0.444	-.044387	.0203391
cpi	.0001126	.0003206	0.35	0.730	-.0005639	.000789
lngce	-.0094816	.0325184	-0.29	0.774	-.0780894	.0591261
_cons	-.0824116	.1312242	-0.63	0.538	-.3592705	.1944473

Arellano-Bond test for AR(1) in first differences: z = -1.70 Pr > z = 0.089
Arellano-Bond test for AR(2) in first differences: z = -1.08 Pr > z = 0.282

Sargan test of overid. restrictions: chi2(10) = 7.89 Prob > chi2 = 0.639
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(10) = 6.74 Prob > chi2 = 0.750
(Robust, but weakened by many instruments.)

Dynamic panel-data estimation, two-step system GMM

Group variable: id	Number of obs = 300
Time variable : year	Number of groups = 20
Number of instruments = 17	Obs per group: min = 12
F(3, 19) = 748.42	avg = 15.00
Prob > F = 0.000	max = 16

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.8965305	.0328856	27.26	0.000	.8277001	.9653609
lnpc_gdp	.0000911	.0035448	0.03	0.980	-.0073282	.0075104
lngdpc	-.0051509	.0029139	-1.77	0.093	-.0112498	.000948
_cons	-.0461481	.0360222	-1.28	0.216	-.1215434	.0292472

Arellano-Bond test for AR(1) in first differences: z = -1.54 Pr > z = 0.123
Arellano-Bond test for AR(2) in first differences: z = -1.24 Pr > z = 0.217

Sargan test of overid. restrictions: chi2(13) = 17.35 Prob > chi2 = 0.184
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(13) = 9.43 Prob > chi2 = 0.739
(Robust, but weakened by many instruments.)

```
Dynamic panel-data estimation, two-step system GMM

Group variable: id                              Number of obs      =       300
Time variable : year                            Number of groups   =        20
Number of instruments = 17                      Obs per group: min =        12
F(6, 19)      =     42.44                                      avg =     15.00
Prob > F      =     0.000                                      max =        16
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.7918452	.0988366	8.01	0.000	.5849778	.9987126
lnpc_gdp	-.0263555	.0112902	-2.33	0.031	-.0499862	-.0027248
lngdpc	.0229466	.0069989	3.28	0.004	.0082977	.0375955
lnto	-.022453	.0069911	-3.21	0.005	-.0370856	-.0078205
cpi	.0007388	.0003563	2.07	0.052	-7.02e-06	.0014846
lngce	.0074152	.0177826	0.42	0.681	-.0298041	.0446345
_cons	-.208838	.0981834	-2.13	0.047	-.4143381	-.0033378

```
Arellano-Bond test for AR(1) in first differences: z =  -1.48  Pr > z =  0.140
Arellano-Bond test for AR(2) in first differences: z =  -0.88  Pr > z =  0.378

Sargan test of overid. restrictions: chi2(10)    =  11.27  Prob > chi2 =  0.337
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(10)    =   7.33  Prob > chi2 =  0.694
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM

Group variable: id                              Number of obs      =       297
Time variable : year                            Number of groups   =        20
Number of instruments = 18                      Obs per group: min =         9
F(3, 19)      =    354.36                                      avg =     14.85
Prob > F      =     0.000                                      max =        17
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.8892122	.0311219	28.57	0.000	.8240732	.9543511
lnsm_valuetraded	-.0022876	.0005067	-4.51	0.000	-.0033482	-.001227
lngdpc	-.0036936	.0032309	-1.14	0.267	-.0104561	.0030688
_cons	-.0586643	.0316586	-1.85	0.079	-.1249265	.0075979

```
Arellano-Bond test for AR(1) in first differences: z =  -1.54  Pr > z =  0.123
Arellano-Bond test for AR(2) in first differences: z =  -1.28  Pr > z =  0.201

Sargan test of overid. restrictions: chi2(14)    =  11.06  Prob > chi2 =  0.681
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(14)    =   9.31  Prob > chi2 =  0.811
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: id                              Number of obs      =       297
Time variable : year                            Number of groups   =        20
Number of instruments = 18                      Obs per group: min =         9
F(6, 19)      =    234.13                                      avg =     14.85
Prob > F      =     0.000                                      max =        17
------------------------------------------------------------------------------
          lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------+----------------------------------------------------------------
          lngini |
             L1. |   .8780622    .056869    15.44   0.000     .7590341    .9970903
                 |
lnsm_valuetraded |  -.0023357   .0006394    -3.65   0.002    -.0036739   -.0009975
          lngdpc |   .0001315   .0036059     0.04   0.971    -.0074159    .0076788
            lnto |  -.0183421   .0097835    -1.87   0.076    -.0388191     .002135
             cpi |   .0003065   .0001461     2.10   0.050     7.38e-07    .0006123
          lngce  |  -.0177023    .014844    -1.19   0.248    -.0487712    .0133666
           _cons |   .0176064   .0508445     0.35   0.733    -.0888124    .1240253
----------------------------------------------------------------------------------

------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.51  Pr > z =  0.132
Arellano-Bond test for AR(2) in first differences: z =  -1.19  Pr > z =  0.233
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(11)   =   8.56  Prob > chi2 =  0.663
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(11)   =   7.51  Prob > chi2 =  0.756
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: id                              Number of obs      =       300
Time variable : year                            Number of groups   =        20
Number of instruments = 17                      Obs per group: min =        12
F(3, 19)      =   1544.66                                      avg =     15.00
Prob > F      =     0.000                                      max =        16
------------------------------------------------------------------------------
           lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------+----------------------------------------------------------------
           lngini |
              L1. |    .909205   .0214878    42.31   0.000     .8642305    .9541796
                  |
lninterest_margin |  -.0013217   .0017213    -0.77   0.452    -.0049244     .002281
           lngdpc |  -.0041908   .0019179    -2.19   0.042    -.0082049   -.0001766
            _cons |  -.0406977   .0273977    -1.49   0.154    -.0980416    .0166463
-----------------------------------------------------------------------------------

------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.53  Pr > z =  0.126
Arellano-Bond test for AR(2) in first differences: z =  -1.25  Pr > z =  0.210
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(13)   =  17.16  Prob > chi2 =  0.192
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(13)   =   9.43  Prob > chi2 =  0.740
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: id                              Number of obs      =       300
Time variable : year                            Number of groups   =        20
Number of instruments = 17                      Obs per group: min =        12
F(6, 19)      =    219.65                                      avg =     15.00
Prob > F      =     0.000                                      max =        16
------------------------------------------------------------------------------
          lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------+------------------------------------------------------------
          lngini |
             L1. |    .897418   .0510019    17.60   0.000     .7906699    1.004166
                 |
lninterest_margin |   .0016395   .0028768     0.57   0.575    -.0043817    .0076608
          lngdpc |  -.0015566   .0029417    -0.53   0.603    -.0077136    .0046003
            lnto |  -.0156797   .0058723    -2.67   0.015    -.0279706   -.0033887
             cpi |   .0003732   .0001957     1.91   0.072    -.0000363    .0007828
           lngce |  -.0035198    .011708    -0.30   0.767    -.0280249    .0209854
           _cons |  -.0070618   .0495445    -0.14   0.888    -.1107596     .096636
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.56  Pr > z =  0.119
Arellano-Bond test for AR(2) in first differences: z =  -1.12  Pr > z =  0.263
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(10)   =  12.70  Prob > chi2 =  0.241
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(10)   =   9.14  Prob > chi2 =  0.519
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: id                              Number of obs      =       295
Time variable : year                            Number of groups   =        20
Number of instruments = 18                      Obs per group: min =         9
F(3, 19)      =    705.44                                      avg =     14.75
Prob > F      =     0.000                                      max =        17
------------------------------------------------------------------------------
       lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
       lngini |
          L1. |   .8824976   .0205381    42.97   0.000     .8395109    .9254843
              |
 lnsm_turnover |    -.00315   .0005906    -5.33   0.000    -.0043861   -.0019139
       lngdpc |  -.0115512   .0015685    -7.36   0.000    -.0148341   -.0082683
        _cons |   .0121811   .0250104     0.49   0.632    -.0401662    .0645283
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.50  Pr > z =  0.133
Arellano-Bond test for AR(2) in first differences: z =  -1.25  Pr > z =  0.210
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(14)   =  13.68  Prob > chi2 =  0.474
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(14)   =  10.09  Prob > chi2 =  0.755
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM

Group variable: id                              Number of obs      =       295
Time variable : year                            Number of groups   =        20
Number of instruments = 18                      Obs per group: min =         9
F(6, 19)      =    231.61                                      avg =     14.75
Prob > F      =     0.000                                      max =        17
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.8578787	.0535914	16.01	0.000	.7457106	.9700468
lnsm_turnover	-.0018351	.0007309	-2.51	0.021	-.0033649	-.0003053
lngdpc	-.0026958	.0037284	-0.72	0.478	-.0104994	.0051078
lnto	-.0178392	.0083304	-2.14	0.045	-.035275	-.0004033
cpi	.0001171	.0001106	1.06	0.303	-.0001143	.0003485
lngce	-.0157901	.0120423	-1.31	0.205	-.040995	.0094147
_cons	.0183644	.0407072	0.45	0.657	-.0668367	.1035655

```
Arellano-Bond test for AR(1) in first differences: z =  -1.45  Pr > z =  0.146
Arellano-Bond test for AR(2) in first differences: z =  -1.08  Pr > z =  0.281

Sargan test of overid. restrictions: chi2(11)    = 12.21  Prob > chi2 =  0.348
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(11)    =  7.06  Prob > chi2 =  0.794
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM

Group variable: id                              Number of obs      =       290
Time variable : year                            Number of groups   =        20
Number of instruments = 17                      Obs per group: min =         6
F(3, 19)      =    466.75                                      avg =     14.50
Prob > F      =     0.000                                      max =        16
```

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.895244	.0457207	19.58	0.000	.7995493	.9909386
lnregcaptoriskasset	.0126397	.0088418	1.43	0.169	-.0058664	.0311458
lngdpc	-.0082518	.0048364	-1.71	0.104	-.0183746	.001871
_cons	-.0555192	.0482449	-1.15	0.264	-.1564969	.0454586

```
Arellano-Bond test for AR(1) in first differences: z =  -1.49  Pr > z =  0.137
Arellano-Bond test for AR(2) in first differences: z =  -1.04  Pr > z =  0.300

Sargan test of overid. restrictions: chi2(13)    = 11.87  Prob > chi2 =  0.539
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(13)    = 10.89  Prob > chi2 =  0.620
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: id                              Number of obs      =       290
Time variable : year                            Number of groups   =        20
Number of instruments = 17                      Obs per group: min =         6
F(6, 19)      =     43.65                                      avg =     14.50
Prob > F      =     0.000                                      max =        16
------------------------------------------------------------------------------
                  lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------+----------------------------------------------------------------
                  lngini |
                     L1. |   .8836625    .071275    12.40   0.000     .7344822    1.032843
                         |
lnregcaptoriskasset      |   .0201591   .0156319     1.29   0.213    -.0125587    .0528769
                 lngdpc  |  -.0011509   .0074291    -0.15   0.879    -.0167002    .0143984
                   lnto  |  -.0252429   .0083894    -3.01   0.007    -.0428021   -.0076837
                    cpi  |   .0003482   .0001579     2.21   0.040     .0000178    .0006786
                  lngce  |  -.0341926   .0139946    -2.44   0.024    -.0634836   -.0049017
                  _cons  |   .0384821   .0936383     0.41   0.686    -.1575052    .2344693
------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.48  Pr > z =  0.140
Arellano-Bond test for AR(2) in first differences: z =  -0.81  Pr > z =  0.416
------------------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(10)    =   9.12  Prob > chi2 =  0.521
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(10)    =   6.04  Prob > chi2 =  0.812
  (Robust, but weakened by many instruments.)
```

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: id                              Number of obs      =       294
Time variable : year                            Number of groups   =        20
Number of instruments = 18                      Obs per group: min =         6
F(3, 19)      =    781.20                                      avg =     14.70
Prob > F      =     0.000                                      max =        17
------------------------------------------------------------------------------
         lngini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
----------------+----------------------------------------------------------------
         lngini |
            L1. |   .9089129   .0220622    41.20   0.000     .8627363    .9550896
                |
lnsm_volatility |   .0002108   .0003387     0.62   0.541    -.0004981    .0009196
         lngdpc |  -.0035615   .0025153    -1.42   0.173    -.0088261    .0017032
          _cons |  -.0504609   .0211815    -2.38   0.028    -.0947943   -.0061276
---------------------------------------------------------------------------------

---------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.56  Pr > z =  0.118
Arellano-Bond test for AR(2) in first differences: z =  -1.22  Pr > z =  0.222
---------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(14)    =  18.13  Prob > chi2 =  0.201
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(14)    =  10.82  Prob > chi2 =  0.700
  (Robust, but weakened by many instruments.)
```

Dynamic panel-data estimation, two-step system GMM

Group variable: id | Number of obs = 294
Time variable : year | Number of groups = 20
Number of instruments = 18 | Obs per group: min = 6
F(6, 19) = 121.29 | avg = 14.70
Prob > F = 0.000 | max = 17

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.8920454	.0457968	19.48	0.000	.7961916	.9878992
lnsm_volatility	.0026333	.0014119	1.87	0.078	.0055884	.0003218
lngdpc	-.0061556	.0033456	-1.84	0.081	-.013158	.0008468
lnto	-.013675	.0063313	-2.16	0.044	-.0269266	-.0004234
cpi	.000521	.0002894	1.80	0.088	-.0000847	.0011266
lngce	.0060901	.0136501	0.45	0.661	-.0224799	.0346601
_cons	.0036954	.0490048	0.08	0.941	-.0988729	.1062637

Arellano-Bond test for AR(1) in first differences: z = -1.47 Pr > z = 0.141
Arellano-Bond test for AR(2) in first differences: z = -1.25 Pr > z = 0.212

Sargan test of overid. restrictions: chi2(11) = 9.66 Prob > chi2 = 0.561
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(11) = 9.63 Prob > chi2 = 0.564
(Robust, but weakened by many instruments.)

Dynamic panel-data estimation, two-step system GMM

Group variable: id | Number of obs = 301
Time variable : year | Number of groups = 20
Number of instruments = 17 | Obs per group: min = 12
F(3, 19) = 586.46 | avg = 15.05
Prob > F = 0.000 | max = 16

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.8778837	.0221086	39.71	0.000	.8316098	.9241575
liberalization	-.0124445	.0043809	-2.84	0.010	-.0216138	-.0032751
lngdpc	-.0065345	.0018439	-3.54	0.002	-.010394	-.0026751
_cons	-.0417321	.027858	-1.50	0.151	-.1000396	.0165754

Arellano-Bond test for AR(1) in first differences: z = -1.56 Pr > z = 0.119
Arellano-Bond test for AR(2) in first differences: z = -1.25 Pr > z = 0.211

Sargan test of overid. restrictions: chi2(13) = 12.94 Prob > chi2 = 0.452
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(13) = 8.88 Prob > chi2 = 0.782
(Robust, but weakened by many instruments.)

Dynamic panel-data estimation, two-step system GMM

Group variable: id   Number of obs = 301
Time variable : year   Number of groups = 20
Number of instruments = 17   Obs per group: min = 12
F(5, 19) = 372.62   avg = 15.05
Prob > F = 0.000   max = 16

lngini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngini						
L1.	.9192981	.0300251	30.62	0.000	.8564549	.9821413
liberalization	-.0106709	.0038574	-2.77	0.012	-.0187446	-.0025972
lngdpc	-.0069208	.0025938	-2.67	0.015	-.0123498	-.0014918
cpi	.0002305	.0002043	1.13	0.273	-.0001971	.0006581
lngce	.0064565	.010203	0.63	0.534	-.0148987	.0278117
_cons	-.021163	.0388739	-0.54	0.592	-.102527	.0602011

Arellano-Bond test for AR(1) in first differences: z = -1.54 Pr > z = 0.124
Arellano-Bond test for AR(2) in first differences: z = -1.31 Pr > z = 0.189

Sargan test of overid. restrictions: chi2(11) = 10.96 Prob > chi2 = 0.446
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(11) = 10.45 Prob > chi2 = 0.490
(Robust, but weakened by many instruments.)

CURRICULUM VITAE

Personal Information:

Name - Surname: Ambreen Sultan

E-mail (1): ambreen.sultan@ibnhaldun.edu.tr

E-mail (2): ambreen.sultan@ymail.com

Education:

2007-2011 Bachelor's in Public Administration (BPA), Fatima Jinnah Women University, Pakistan

2015-2017 Master of Science in Finance, International Islamic University Malaysia, Kuala Lumpur Malaysia

2017-2019 Master of Art in Financial Economics, Ibn Haldun University, Istanbul Turkey

Experience:

Feb - May 2019 Teaching fellow: SPS 104 Comparative Theories and Methods, Ibn Haldun University, Istanbul Turkey

Sep 2018 - Jan 2019 Teaching fellow: SPS 101, Humanities and Societies Ibn Haldun University, Istanbul Turkey

April - June 2017 Admin Assistant, Department of Promotion & Marketing, International Islamic University Malaysia, Kuala Lumpur Malaysia