ISSN: 2147-6071

SEYAD Siyaset, Ekonomi ve Yönetim Araştırmaları Dergisi

E-ISSN: 2147-7035

REASSESSMENT OF FINANCIAL DEVELOPMENT AND INCOME INEQUALITY RELATIONSHIP IN TERMS OF FINANCIALLY DEVELOPED AND UNDERDEVELOPED COUNTRIES

Finansal Gelişme ve Gelir Eşitsizliği İlişkisinin Finansal Olarak Gelişmiş ve Gelişmemiş Ülkeler Açısından Yeniden Değerlendirilmesi

Araştırma & Yayın Etiği

Bu makale en az iki hakem tarafından incelenmiş, iThenticate yazılımı ile taranmış, araştırma yayın ve etiğine aykırılık edilmemiştir.

Nurullah ALTINTAŞ

Dr. Öğr. Üyesi, Sakarya Üniversitesi, Siyasal Bilgiler Fakültesi, İktisat Bölümü
naltintas@sakarya.edu.tr
0000-0001-9425-3516

Ahmet Gökçe AKPOLAT

Dr. Öğr. Üyesi, Dumlupınar Üniversitesi, Uygulamalı Bilimler Yüksekokulu, Bankacılık ve Finans
ahmet.akpolat@dpu.ed u.tr 0000-0001-7149-6339

Research & Publication Ethics

This article was reviewed by at least two referees, a similarity report was obtained using iThenticate, and compliance with research/publication ethics was confirmed.

Altıntaş, Nurullah – Akpolat, Ahmet Gökçe. "Reassessment of Financial Development and Income Inequality Relationship in Terms of Financially Developed and Underdeveloped Countries". Siyaset, Ekonomi ve Yönetim Araştırmaları Dergisi 9/1(2021), 76-104.

Makale Bilgisi

Makale Türü: Araştırma Makalesi/ Research Article
Geliş Tarihi: 15.04.2021
Kabul Tarihi: 02.06.2021
Yayın Tarihi: 30.06.2021

Reassessment of Financial Development and Income Inequality Relationship in Terms of Financially Developed and Underdeveloped Countries

Abstract
This paper investigates the relationship between financial development and income inequality for 52 countries over the period 2000-2014. 32 countries are determined as financially underdeveloped while 20 countries are determined as financially developed based on the classification made by Demirguc-Kunt and Levine(2001). According to the results, the inverted-U hypothesis suggested by Greenwood and Jovanovic(1990) is confirmed for financially underdeveloped countries while the U-shaped relationship is true for the case of financially developed countries.

Keywords: Financial Development; Income Inequality; System GMM

Finansal Gelişme ve Gelir Eşitsizliği İlişkisinin Finansal Olarak Gelişmiş ve Gelişmemiş Ülkeler Açısından Yeniden Değerlendirilmesi

Öz
Bu çalışma, için finansal gelişme ve gelir eşitsizliği arasındaki ilişkiyi 2000-2014 döneminde 52 ülke için araştırmaktadır. Demirgüç-Kunt ve Levine (2001) tarafından yapılan sınıflandırmaya göre 32 ülke finansal olarak az gelişmiş, 20 ülke ise finansal olarak gelişmiş olarak belirlenmiştir. Sonuçlara göre, finansal olarak gelişmemiş ülkelerde Greenwood ve Jovanovic (1990) tarafından ortaya konulan ters-U hipotezi doğrulanırken, finansal olarak gelişmiş ülkelerde ise U-biçimli ilişkiye ulaşılmıştır.

Anahtar Kelimeler: Finansal Gelişme, Gelir Eşitsizliği, Sistem GMM

Introduction

The literature on financial development and economic growth dates back to a century ago and great progress has been made in this period. On the other hand, financial development- income inequality literature has not reached 30 years yet, it is developing day by day and new points that attract the interest of researchers in this field are mentioned. In the first study of Greenwood and Jovanovic (1990), the relationship between financial development and income inequality was theoretically modelled as inverted- U shape. According to this model, while financial development increases income inequality in the early stages of development; it was pointed out that the financial system develops along with economic development and reduces income inequality. After this theoretical study, Galor and Zeira (1993) and Banerjee and Newman (1993) modelled the relationship between financial development and income inequality as linear and negative. In other words, they theoretically demonstrated that financial development improves income distribution. Based on these theoretical studies, various studies have been conducted. It can be said that these studies are divided into 4 main groups in the prominent literature: In the first group, there are studies which conclude that financial development reduces income inequality. In the second group, there are studies showing that financial development increases income inequality. The third group consists of studies showing that there is a non-linear "U shape" relationship between financial development and income inequality. The last group of studies show that this non-linear relationship is in the "inverted-U" shaped form. The main reason behind the variation in these results is the differences between the period, country / country groups and the econometric method. In particular, the fact that the financial development levels of the countries discussed are different causes the findings to be different. Therefore, these different results in the literature prevent a dominant view on the effect of financial development on income inequality.

Clarke, Xu and Zou (2006), in their studies in the first group known as negative linear hypothesis, analyzed the relationship between income inequality and development of financial intermediation and covering the data of developing and developed countries for the period 1960-1995. Particularly, it has been studied whether the financial intermediation affects the income distribution according to the degree of financial development and thus linearity has been tried to be determined. They found that the increase in financial development in the long term reduced income inequality. Mookerjee and Kalipioni (2010) evaluated the financial development within the scope of financial access by using two-stage OLS method for 2000-2005 period in 65 countries and found that income inequality decreases as financial access increases. Bittencourt (2010) investigated the relationship between financial development and

income inequality in 1985-1994, covering six major regions for Brazil, using Pooled Ordinary Least Squares and one-way Fixed Effects (FE) estimators. The result that financial development has a significant and robust effect in reducing income inequality is concluded. Batuo, Guidi, and Mlamba (2010), which examined the relationship by using the financial development index by GMM method for 22 African countries for the period 1990-2004, reached the conclusion supporting the negative linear hypothesis. Hamori and Hashiguchi (2012), in their analysis of 126 countries for 1963-2002 period and using static panel and GMM methods, pointed out that financial development reduces income inequality but this effect is limited by economic growth. Naceur and Zhang (2016) confirmed this hypothesis for 143 countries in the 1961-2011 period by OLS analysis and concluded that banking indicators are more important than market indicators. Paramati and Nguyen (2019),in which they examined the period of 1981-2014 and used panel ARDL method for 38 countries by making distinction between developed and developing countries, found that the development of the banking system reduces income inequality in both groups but the capital market development yields the same result only in developing countries.

On the other hand, there is an important literature which concludes that financial development increases income inequality. Denk and Cournede (2015), in their study covering the period of 1974-2011 for OECD countries, have shown that excessive financialization causes high income inequality. However, as long as the income of the lowest income group is not affected negatively, income inequality brought about by financialization does not decrease their welfare level. Sehrawat and Giri (2015) have examined the 1982-2012 period for India and in their analysis through the ARDL Boundary test, they concluded that the existing income inequality has increased with financial development. Haan and Sturm (2016) found a positive linear relationship between income inequality and financial development by using the Dynamic Panel Regression for the period 1975-2005 and 121 countries by representing the financial development with credits issued to the private sector. Seven and Coşkun (2016) conducted a GMM analysis covering the period of 1987-2011 by employing the principal components analysis and using banking and capital market indicators as financial development indicators for developing countries. It was concluded that the development of the banking system increased income inequality. Jauch and Watzka (2016) concluded that financial development increased income inequality by using Fixed Effects and Dynamic Panel Method in 138 developed and developing countries in the 1960-2008 period. Jobarteh and Kaya (2019), in their panel data analysis by establishing a comprehensive financial development index for 23 African

countries in the period of 1990-2014, found that financial development increased income inequality and recommended that low-income families should be provided to be able to reach finance with acceptable costs.

As for the U-shaped studies, there are studies, albeit less, which concluded that the relationship is non-linear "U-shaped", meaning that financial development first decreases income inequality and then increases it after a certain threshold**.** Mansour and Wendel (2015) examined East Asian countries for the period 1960-2012. The results confirm the U-shaped hypothesis that the financial sector increases income inequality after reaching a certain size. Park and Shin (2017) stated that financial development contributes to low income inequality up to a certain point and after this point contributes to high income inequality. Brei et al. (2018) examined the effect of financial development on income distribution for 97 developed and developing market economies in the period 1989-2012, taking into account financial structures. According to the results, the connection between financial development and income inequality was confirmed. Financial development first corrects income inequality and then distorts it. However, the financial structure was found to be important for the effect of the relationship.

In the last group, in which Greenwood and Jovanovic (1990)'s theoretical model is confirmed, the presence of many studies is noteworthy. Bacarreza and Rioja (2008) examined 1960-2000 period for the country group consisting of Latin American and Caribbean countries and made their analysis through GMM method. Kim and Lin (2011) used panel thresold regression analysis in their study for 72 countries over the period 1960-2005 and confirmed the "Inverted-U hypothesis" as a result of the analysis. In this study, they emphasized that a certain value should be reached in order to benefit from the positive effect of financial development in reducing inequality in income distribution. Nikoloski (2013) confirmed this hypothesis by using GMM method in 1962-2006 period in a sample of developed and developing countries. Chen and Kinkyo (2016), in their studies using panel ARDL method and Pooled Mean Estimator for the period of 1961-2012 in 88 countries, concluded that while financial development increases income inequality in the short term, it decreases in the long term. Tita and Aziakpono (2016) examined the relationship between the Panel AMG estimator for 15 African countries and the 1985-2007 period using a number of financial development indicators and confirmed this hypothesis for certain indicators. Basirat et al. (2016) used the Fixed Effects method for 20 developing countries in the period 2000-2012 and reached the conclusion supporting the Inverted-U hypothesis. Azam and Raza (2018) examined the relationship for ASEAN-5 countries over the period 1989-2013 through GMM method and the financial development

index which they constructed. Bittencourt et al. (2019) examined the impact of financial development on income inequality for 50 states in the United States. The Panel fixed effects estimator was used in the analysis and the states were classified based on income inequality. It is concluded that in the group whose income inequality is below the sample average, financial development first increases income inequality and then decreases it.

In the studies mentioned above, financial development and income inequality have been examined in terms of both country groups, time dimension and the effects of different financial development indicators and these studies made significant contributions to the development of the literature. However, this relationship has not been analyzed in terms of financial development level in the prominent literature. Although there is a significant correlation between the income level of countries and financial development, this situation does not reveal certainty. In addition, Vietnam, China, Panama, Jordan and South Africa, which are determined to be financially developed and analyzed in this country group for the period 2000-2014, are not among the high income countries. On the other hand, countries such as Venezuela, Uruguay, Brazil, Argentina, Poland and Russia have higher income levels than the countries mentioned above, although they are included in the financially underdeveloped countries in our analysis. It turns out that the high-income level does not always guarantee high financial development (see Demirguc-Kunt and Levine, 2001: 118-121). Indeed, the fact that the theoretical studies in the relevant literature directly refer to financial development increases the importance of such a distinction. This led us to the need for a classification based on financial development in the relationship between financial development and income inequality. This requirement is the most important source of motivation for this study.

The next section introduces the data used in the analysis and make econometric analysis. Section 3 makes a discussion. The last section concludes and suggests the policy implications as an output of the econometric analysis and discussion.

1.Econometric Methodology and Data

This study investigates the impact of banking credits on income inequality in the financially developed and the undeveloped countries. In the econometric analysis, we use the data of the seven series of the five variables over the period 2000-2014 for 52 countries employing two-step panel GMM technique.The employed series in the analysis are the Gini coefficient (GINI) as an indicator of income inequality, the ratio of banking credits to GDP (BANK) and its square ($BANK^2$) as a measure of financial development,natural logarithm real GDP percapita (LRGDP) and its square ($LRGDP^2$) as a measure of economic growth, inflation (INF) and the

ratio of foreign trade to GDP (TR). The GINI data are obtained from the SWIID (Standardized World Income Inequality Database) database (Solt, 2019). The data belonging to the other variables are obtained from the Worldbank database. There is a vast literature on financial development-income inequality and economic growth-income equality nexus that banking credits and real GDP per capita are used to represent financial development and economic growth, respectively. (Clarke vd., 2006; Bacarezza and Rioja, 2008; Kappel, 2010; Kim and Lin, 2011; Hamori and Hashiguchi, 2012; Nikoloski, 2013; Chen and Kinkyo, 2016; Tita and Aziakpono; 2016; Haan and Sturm,2016; Nasreddin and Mensi, 2016; Basirat et.al, 2016; Guillen,2016) The reason why we take both the level values and the squares of the BANK and LRGDP variables is the prominent literature mentioned above, indicating that there may be a nonlinear relationship between income distribution and financial development as well as economic growth. Moreover, inflation (INF) and trade ratio (TR) are regarded as an influential factor having impact on income distribution in many studies(Tian et al., 2011; Georgantopoulos and Tsamis (2011); Faustino and Vali (2011); Monnin,2014; Barusman and Barusman (2017).

The model used in the analysis can be illustrated as follows:

$$GINI_{i,t} = \beta_0 + \beta_1 GINI_{i,t-1} + \beta_2 GINI_{i,t-2} + \beta_3 BANK_{i,t} + \beta_4 (BANK_{i,t})^2 + \beta_5 LRGDP_{i,t} + \beta_6 (LRGDP_{i,t})^2 + \beta_7 INF_{i,t} + \beta_8 TR_{i,t} + u_{it} \quad (1)$$

$u_{it} = \mu_i + v_{it}$ (will be described below in detail) where $\mu_i \approx (0, \sigma_\mu^2)$ and $v_i \approx (0, \sigma_v^2)$ are independent of each other and among themselves , i and t shows individual units and time dimension, respectively. Two lagged values of the dependent variable GINI are used in the regression, due to the fact that the necessary AR(1) and AR(2) conditions are strictly provided in that specification.

We have classified the countries into two groups as financially developed and underdeveloped countries. According to the classification, 20 countries are determined as financially developed and 32 countries are determined as financially underdeveloped. Financial development status is determined by considering two criteria. In this context, if the ratio of the credits issued by the banking sector to the private sector in GDP for any country or the ratio of total transaction volume, which is an indicator of the capital market, in GDP is higher than the average value in the sample, that country is considered financially developed. If these two ratios are below the sample average, the country is considered as financially underdeveloped (Demirguc-Kunt and Levine, 2001: 114,119). However, for this classification to be successful for countries, it is important that the sample is sufficiently large. For example, if the group of a country is mostly

composed of financially underdeveloped countries, then it can be identified as financially developed although it is financially underdeveloped. For this purpose, the classification of Altintas (2018), which compiles this method of Demirguc-Kunt and Levine (2001) to cover 108 countries for the period 2000-2014, is used. Accordingly, 108 countries were classified as financially developed and financially underdeveloped countries, and 52 countries with complete data of the gini coefficient representing income inequality were analysed.

Table-1. List of the Financially Underdeveloped and Financially Developed Countries

Financially Underdeveloped Countries		**Financially Developed Countries**	
Argentina	Macedonia	Australia	Turkey
Brazil	Mexico	Chile	United Kingdom
Bulgaria	Moldova	China	United States
Colombia	Morocco	Denmark	Vietnam
Costa Rica	Namibia	Hong Kong	
Cote D'ivoire	Praguay	Iceland	
Crotia	Peru	Israel	
Czech Republic	Phillippines	Japan	
Ecuador	Poland	Jordan	
Egypt	Romania	Korea	
El Salvador	Russia	Malaysia	
Georgia	Tanzania	Norway	
Hungary	Ukraine	Panama	
Indonesia	Uruguay	Singapore	
Kazakhastan	Venezuela	South Africa	
Kyrgyz Republic	Zambia	Switzerland	

2.1. Preliminary Data Analysis: Descriptive Statistics

Table-2. Descriptive Statistics

Part 2a:Financially Developed Countries								
Variable	***Obs***	***Unit of Measurement***	***Mean***	***Std. Dev.***	***Min***	***Max***	***Skewness***	***Kurtosis***
GINI	300	%	37.865	8.879822	23.6	58.7	0.356254	2.580503
BANK	300	% of GDP	110.3083	47.00342	21.4308	312.118	0.90217	4.195044
LRGDP	300	Natural log	9.906669	1.138919	6.920049	11.42537	-0.76837	2.679615
INF	300	%	3.871883	4.043873	-5.9921	22.6733	1.550664	7.528637
TR	300	% of GDP	115.4277	100.9388	24.4909	442.62	2.010765	6.199875
Part 2b:Financially Underdeveloped Countries								
Variable	***Obs***	***Unit of Measurement***	***Mean***	***Std. Dev.***	***Min***	***Max***	***Skewness***	***Kurtosis***
GINI	480	%	39.67188	7.951173	25	57.7	0.295467	2.271534
BANK	480	% of GDP	35.23749	16.54279	6.16823	73.8312	0.295467	2.271534
LRGDP	480	Natural log	8.47693	0.8719	6.414805	9.929194	-0.4452	2.288736
INF	480	%	7.855645	7.140955	-2.13643	45.9433	1.944138	8.273814
TR	480	% of GDP	78.82542	31.9536	22.106	168.924	0.610419	2.906099

Table-2 illustrates the descriptive statistics of the variables used in the econometric analysis according to the two separate country groups, respectively.Table-2 clearly shows that while the ratio of banking credits to GDP (BANK) and the ratio of foreign trade to GDP (TR) are relatively very high in the financially developed countries; on the other hand, inflation (INF) rate is quite low compared to the financially underdeveloped countries. The mean of Gini coefficient (GINI) is slighly lower in the financially developed countries and the minimum, maximum and standard deviation are very close. The mean of ratio of banking credits to GDP (BANK) is very high in the financially developed countries as well as its standard deviation, minimum and maximum values as compared with the financially underdeveloped countries. The mean of LRGDP is higher in the financially developed countries as it is expected due to the fact that the large majority of the financially developed countries are also developed countries.The mean of trade ratio (TR) is higher in the financially developed countries while its minimum, maximum and standard deviation are also higher. It is also remarkable that the standard deviation of trade balance (TR) is so close to its mean value in the financially developed countries showing that trade ratio significantly differentiates in this country group from time to time and country to country.

As an overall assessment, it can be concluded that when the two country groups are considered together, they can be considered as close to each other in terms of income inequality (GINI) , while they are different from each other in other aspects which are inflation (INF) , trade ratio (TR) and economic growth (LRGDP).

2.2. Dynamic Panel Data Analysis and Panel System GMM Technique

Panel data analysis plays an important role in obtaining relationships that are difficult to detect with a particular cross-section or time series. Moreover, panel data analysis is a useful method because it has more degree of freedom than time series analysis and includes more observations, as well as eliminating multicollinearity problems. On the other hand, since current behaviors of economic agents can be affected by past behaviors due to the several reasons such as continuity or habit persistence, dynamic effects need to be modeled. It is observed that many economic relationships are intrinsically dynamic. Therefore, dynamic panel data analysis allows economists to better comprehend the dynamics of adjustment (Baltagi, 2005:135). The first dynamic panel data model was developed by Balestra and Nerlove(1966) and since then these models have become widespread in the panel data literature (Milimet and Mcdonough, 2017).

A dynamic panel data model can be shown as follows:

$$y_{it} = \delta y_{i,t-1} + x_{it}^{'}\beta + u_{it} \qquad i = 1,\ldots\ldots N; t = 1,\ldots\ldots T \tag{2}$$

where y_{it} and y_{it-1} is dependent variable and its lagged value, respectively. x_{it} denotes a vector of explanatory variables. u_{it} represents the error term and is assumed to follow a one-way error component model as follows:

$$u_{it} = \mu_i + v_{it} \tag{3}$$

where the mean values of μ_i and v_{it} are assumed to be zero and the variances constant. However, there are some problems caused by using the lagged value of dependent variable as an explanatory variable. Since y_{it} is a function of μ_i, y_{it-1} is therefore also a function of μ_i. In this situation, y_{it-1} becomes correlated with the error term. The fact that the lagged value of the dependent variable is correlated with the error term makes the OLS estimator biased and inconsistent, even if v_{it} is not serially correlated. The fixed effects estimator becomes consistent only in samples where T is too large compared to N. Anderson and Hsiao (1981) developed a method in which individual effects can be eliminated through the first difference transformation. It is easier to overcome the problem of the correlation between explanatory

variables and the error term, in this manner. When we rewrite equation (1) following Anderson and Hsiao (1981), we get:

$$GINI_{i,t} - GINI_{i,t-1} = \beta_1(GINI_{i,t-1} - GINI_{i,t-2}) + \beta_2(GINI_{i,t-2} - GINI_{i,t-3}) + \beta_3(BANK_{i,t} - BANK_{i,t-1}) + \beta_4[BANK^2_{i,t} - BANK^2_{i,t-1}] + \beta_5(LRGDP_{i,t} - LRGDP_{i,t-1}) + \beta_6[LRGDP^2_{i,t} - LRGDP^2_{i,t-1}] + \beta_7(INF_{i,t} - INF_{i,t-1}) + \beta_8(TR_{i,t} - TR_{i,t-1}) + (v_{it} - v_{it-1}) \quad (4)$$

Anderson and Hsiao (1981) proposed that instrumental variables can be employed in the process of estimation of the difference equation shown in (4). In this method, $GINI_{i,t-2}$ variable can be used as instrumental variable. If v_{it} has no serial correlation, $GINI_{i,t-2}$ will be a valid instrumental variable. In spite of the fact that there exists a correlation between $GINI_{i,t-2}$ and $(GINI_{i,t-1} - GINI_{i,t-2})$, $GINI_{i,t-2}$ is not correlated with $(v_{it} - v_{it-1})$ which is the error term in equation (4) (Najarzadeh et.al, 2014). However, this instrumental variable (IV) estimation method results in inefficient estimates, albeit consistent, due to the failure to meet all appropriate moment conditions.(Baltagi, 2005:135-136). Arellano and Bond (1991) stated that this situation is caused by not using all possible instrumental variables and developed the generalized method of moments (GMM). The difference GMM method of Arellano and Bond (1991) and the system GMM method of Arellano and Bover (1995) and Blundell and Bond (1998) have become widely used in the subsequent period for dynamic panel data analysis.

Arellano and Bond (1991) proposed that the use of all valid lagged values of variables as instrumental variables can be an efficient method. Arellano and Bond (1991) proposed an analogous procedure with Anderson and Hsiao (1981) to get rid of country-specific effects. However, they revealed that employing the difference equation method to remove country - specific effects brings about a new bias since the new disturbance term $(v_{it} - v_{it-1})$ of the difference equation is correlated with$(GINI_{i,t-1} - GINI_{i,t-2})$. If the error term does not have serial correlation and the regressors are weak, it is supposed that the following moment conditions hold:

$$E[GINI_{i,t} - s(\nu_{it} - \nu_{i,t-1})] = 0 \; for \; s \geq 2; t = 3, \ldots, T$$
$$E[X_{i,t} - s(\nu_{it} - \nu_{i,t-1})] = 0 \; for \; s \geq 2; t = 3, \ldots, T \quad (5)$$

where *X*'s denote the regressors. Arellano and Bond (1991) developed a one-step and a two-step GMM estimator by utilizing the moment conditions shown in equation (5) (Najarzadeh et.al, 2014).

In spite of the fact that they are commonly used in dynamic panel data analysis, Soto emphasized that both the difference GMM estimator suggested by Arellano and Bond (1991) system GMM developed by Blundell and Bond (1998) were developed within the context of labor and industrial studies which the number of individuals (N) is very large. However, the majority of dynamic panel studies include less than 100 countries and often less than half of that value. Moreover, the full set of instrumental variables cannot be used due to the small sample which may lower the efficiency of the various GMM estimators employed in studies. For this reason, Soto (2009) tested the performance of the different estimators including the difference GMM and the system GMM according to Monte Carlo simulations for small samples. He found that the system GMM estimator has the lowest bias as compared with the other estimators, including the difference GMM estimator (Soto, 2009). Furthermore, Blundell and Bond (1998) emphasized that the commonly employed difference GMM estimator obtained after taking first difference was concluded to possess large finite sample bias and poor precision characteristic in simulation studies under the condition that the autoregressive parameter is large and the number of time series observations is small. They demonstrated that the system GMM estimator, which they suggested, performs better than the difference GMM estimator when the additional moments conditions that necessitate for the system GMM are valid (Castello-Climent, 2008). Due to these crucial reasons, we prefer to use the system GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998).

As for the comparison between one-step and two-step system GMM, it is concluded that two-step system GMM is asymptotically more efficient than one-step system GMM. Even if earlier researchers one-step system GMM estimators due to the fact that the standard errors of two-step system GMM estimators were biased downwards, the bias in the standard errors are corrected using Windmeijer's (2005) error correction procedure (Roodman, 2009a) . For this reason, we prefer using two-step system GMM estimator rather than one-step system GMM estimator due to its asymptotic efficiency.

Arellano and Bover (1995) suggested a forward orthogonal deviation transformation to eliminate country-specific effects rather than first-differencing transformation since first differencing transformation magnifies any gaps in the data. If one period of data is missing, two differences are missing in transformed data. The forward orthogonal deviation transformation transforms the data by subtracting each observation value from the average of all future observation values, thus preventing data loss no matter how many gaps. Since lagged observation values do not include in the formula, they are regarded as valid instruments

(Roodman, 2009a). Moreover, Hayakawa (2009) demonstrated through the method of Monte Carlo simulations that the GMM estimator of the model transformed by the FOD tends to work better than the one transformed by the first difference. Therefore, we prefer to use forward orthogonal deviation transformation to eliminate country-specific effects due to its advantages.

2.3. Results

Table-2 and Table-3 illustrate the two-step system GMM results for the financially underdeveloped and the financially underdeveloped countries, respectively. As mentioned above, both two lags of the dependent variable GINI are used since this specification provides the required AR(1), AR(2) and Hansen p-values. Four regression models are used to determine whether there is a nonlinear or a linear relationship for none, one or both of the finance-income inequality and finance-economic growth relationships. Moreover, a dummy variable, which its value is determined as 0 for 2000-2007 and 1 for 2008-2014, representing the 2008 global financial crisis is included in the regressions to control for the effects of the financial crisis. For both tables, Model1 assumes a linear relationship between finance-income inequality and economic growth-income inequality and the regression is set up accordingly. The regression of Model2 assumes that the nexus between finance and income inequality nonlinear, while the economic growth-income inequality nexus linear. On the contrary, Model3 assumes that while the relationship between finance and income inequality is linear, the economic growth-income inequality nexus is nonlinear. As for Model4, it assumes both of the finance-income inequality and economic growth-income inequality relationship is nonlinear.

2.3.1. Results for the Financially Underdeveloped Countries

Table-3. Two-Step System GMM Regression Results for the Financially Underdeveloped Countries

Independent Variables	***Model1***	***Model2***	***Model3***	***Model4***
Gini(-1)	1.5159***(4.44)	1.58***(6.36)	1.649***(10.61)	1.609***(13.16)
Gini(-2)	-0.529	-0.589*(-2.03)	-0.67***(-4.44)	-0.62***(-5.06)
Bank	0.0033	0.0198	0.0008	0.0423**(2.41)
(Bank)^2		-0.0002		-0.0004**(-2.37)
Lrgdp	-0.295	-0.155	-2.976*(-1.74)	-5.978***(-2.91)
(Lrgdp)^2			0.174*(1.73)	0.346***(2.88)
Inf	-0.021	-0.0235*(-1.78)	-0.113	-0.027**(-2.22)
Tr	-0.0018	-0.0024	-0.002	-0.0057**(-2.33)
Crisis Dummy	-0.0121	-0.32	-0.158	-0.131*(-1.81)
AR(1)(p-value)	0.091	0.046	0.003	0.000
AR(2)(p-value)	0.159	0.169	0.174	0.182
Hansen J-test(p-value)	0.229	0.547	0.221	0.780
Number of Instruments	16	19	19	22
Number of Groups	32	32	32	32
Number of Observations	384	384	384	384

- Robust t-statistics are reported in parentheses of estimated coefficients. The regression coefficients are estimated using the Arellano and Bover (1995) and Blundell and Bond (1998) system GMM approach.
- ***,*** and * represent statistically significance at 1%, 5% and 10% significance level, respectively.
-Syntax used to obtain estimates of GMM is xtabond2 in Stata (Roodman, 2009b). Windmeijer (2005) finite sample correction for standard errors is employed.
-The values reported for the Hansen J-test is the p-values for the null hypothesis of instrument validity. The values reported for AR(1) and AR(2) are the p-values for first-and second-order auto-correlated disturbances in the first differences equations.
- Instrument list: For endogenous and predetermined variables, lags 1 and 2 of three lagged GINI, lagged BANK and BANK^2, two lagged LRGDP and LRGDP^2; for strictly exogenous variables, TR and its first three lags and first two lags of crisis dummy. *collapse* command is used to reduce the number of instruments to avoid too many instruments problem as this problem weakens the Hansen test of the instruments' joint validity (Roodman, 2009a).

Table-3 clearly shows that the appropriate regression model is Model4 that demonstrates an existing a nonlinear relationship for both finance-income inequality and economic growth-income inequality nexus. Table-3 also shows that we confront a misspecification problem if the model specification is not determined as nonlinear for both financial development -income inequality and economic growth-income inequality nexus. As for the inappropriate models (Model1, Model2 and Model3), we can say the following: Even though the coefficient of lagged value of the dependent variable (GINI(-1)) has highly significant t-statistics in all of the four models, the most of the other variables in the Model1, Model2 and Model3 have statistically insignificant t-statistics. In Model2, only the two lagged value of Gini (GINI(-2)) and inflation has weak statistically significance t-statistics only at %10 significance level as well as GINI(-1). Looking at Model3, while the two lagged Gini (GINI(-2)) has a highly statistically significant coefficient at 1% significance level like the coefficient of the one lagged Gini (GINI(-1)); a weak U-shaped relationship, which the coefficient of LRGDP is negative and the coefficient of its square is positive, is determined at 1% significance level.

As for Model4, which is the most appropriate one, while the coefficient of lagged Gini (GINI(-1)) has a positive sign of the coefficient of two lagged Gini (GINI(-2)) has a negative sign. This shows that income distribution is adversely affected by the previous period's income distribution while it is positively affected by the income distribution of two periods before. Banking credits (BANK), which is a proxy for financial development, shows an inverted-U shaped relationship at 5% significance level that its coefficient is positive while the coefficient of its square ($BANK^2$) is negative. This result indicates that the ratio of banking credits to GDP (BANK) distorts the income distribution in the early stages while it improves the income distribution in later periods in the financially underdeveloped countries. This can be interpreted that, since this group of countries consists of the financially underdeveloped countries, in the early stages of financial development, only a fraction of the population included in the upper-income group can have an opportunity to access to finance, which distorts income distribution. However, as the opportunities to access to financial facilities evolve positively, income distribution can start to improve since large sections of the population can benefit from these financial opportunities. In this situation, an improvement in income distribution can be expected. As for LRGDP, which is proxy for economic growth, it is observed that a strong U-shaped relationship between income inequality and economic growth is determined, since LRGDP has a negative coefficient while the coefficient of its square ($LRGDP^2$) has a positive one which are both statistically significant at %1 significance level. This result shows that while

economic growth positively affects the income distribution in the first stages, it adversely affects the income distribution in the following stages, in this country group. Looking at the impact of inflation (INF), it is seen that it reduced income inequality or improved income distribution for this time period in the financially underdeveloped countries. This can be considered as an interesting finding showing that the increase in inflation affected the upper-income group more than the lower-income group. As for trade ratio (TR), the coefficient of TR is negative and statistically significant at %1 significance level; this means that the increase in foreign trade in the financially underdeveloped countries reduced income inequality during the period under consideration. This result shows that people in the lower-income group benefited more from the welfare effect of foreign trade than people in the higher-income group, which improves income distribution. Looking at the impacts of global financial crisis which is proxied by a dummy variable, it is seen that its coefficient is significant at 10% level. This can be regarded as a weak evidence that it affected income distribution in financially underdeveloped countries for this time period. Despite the fact that this finding gives us weak evidence that the global financial crisis affected income distribution, if we take this weak evidence as a given data we can interpret this finding that the adverse impact of global financial crisis had been mostly on the upper-income group rather than the lower income group in the financially underdeveloped countries.

To summarize briefly; it is determined that the relationship between banking credits (BANK) and income inequality has an inverted-U shaped form while the economic growth-income inequality nexus has a U-shaped. Moreover, inflation (INF), foreign trade (TR) and the global financial crisis are determined as that they reduced income inequality in 2000-2014 time period.

2.3.2. Results for the Financially Developed Countries

Table-4: Two-Step System GMM Regression Results for the Financially Developed Countries

Independent Variables	***Model1***	***Model2***	***Model3***	***Model4***
Gini(-1)	1.501***(5.61)	1.71***(13.67)	1.712***(12.61)	1.786***(18.33)
Gini(-2)	-0.569**(-2.60)	-0.746*(-2.03)	-0.75***(-5.45)	-0.85***(-8.30)
Bank	-0.00255	-0.016	-0.0022	-0.021**(-3.58)
(Bank)^2		-0.00004		0.00067***(2.93)
Lrgdp	-0.419	-0.105	1.6693	3.085**(2.34)
(Lrgdp)^2			-0.098	-0.183**(-2.41)
Inf	-0.0203	-0.0224*(-1.78)	-0.0111	-0.034***(-3.53)
Tr	-0.0011	0.00096	0.0005	0.0013**(0.029)
Crisis Dummy	0.051	0.073	0.037	0.133**(2.28)
AR(1)(p-value)	0.060	0.027	0.013	0.022
AR(2)(p-value)	0.115	0.147	0.118	0.244
Hansen J-test(p value)	0.296	0.182	0.222	0.618
Number of Instruments	12	14	14	16
Number of Groups	20	20	20	20
Number of Observations	260	260	260	260

- Robust t-statistics are reported in parentheses of estimated coefficients. The regression coefficients are estimated using the Arellano and Bover (1995) and Blundell and Bond (1998) system GMM approach.
- ***,*** and * represent statistically significance at 1%, 5% and 10% significance level, respectively.
-Syntax used to obtain estimates of GMM is xtabond2 in Stata (Roodman, 2009b). Windmeijer (2005) finite sample correction for standard errors is employed.
-The values reported for the Hansen J-test is the p-values for the null hypothesis of instrument validity. The values reported for AR(1) and AR(2) are the p-values for first-and second-order auto-correlated disturbances in the first differences equations.
- Instrument list: For endogenous and predetermined variables, lag 1 lagged GINI, three lagged BANK and BANK^2, LRGDP and LRGDP^2; for strictly exogenous variables, INF and its first lag, TR and its first two lags. *collapse* command is used to reduce the number of instruments to avoid too many instruments problem as it weakens the Hansen test of the instruments' joint validity (Roodman, 2009a).

Table-4 illustrates the two-step system GMM regression results for the financially developed countries. It demonstrates that the most of the variables have statistically insignificant coefficients and t-statistics in Model1, Model2 and Model3. Only the coefficients one lagged and two lagged Gini (GINI(-1) and GINI(-2)) variables are determined as statistically significant in these three models as well as inflation (INF) variable in Model2 which has a weak significance at only 1% significance level. On the other hand, all of the coefficients and t-statistics of the variables of the Model4 have statistically significant signs showing that a nonlinear model specification is appropriate for both of financial development-income inequality and economic growth-income inequality nexus, just as in the case of Table-3. In other words, if we do not determine a nonlinear model for both of these relationships, as in Model 4, we will probably face a specification error.

As for Model4, while the coefficient of one lagged coefficient of Gini (GINI(-1)) has a positive sign, the coefficient of two lagged Gini (GINI(-2)) has a negative one indicating that the previous period's income distribution adversely affects current income distribution while the income distribution of two periods before reduces income inequality. Looking at the ratio of banking credits to GDP (BANK),which is a proxy for financial development, it is observed that a U-shaped relationship between financial development-income inequality. This finding reveals that banking credits reduce income inequality in the early period while they deteriorate income distribution in the following period. This situation can be interpreted that since these countries are financially developed countries, a vast majority of public can have opportunity to access to finance (especially when compared to the financially underdeveloped countries). For this reason, since a vast majority of public can benefit from financial resources, an increase in banking credits can lead to improve income distribution even in the early periods. However, in the following period, the financially developed countries can confront an excessive financialization phenomenon. In the case of excessive financialization or excessive credit expansion, the upper-income group in the financially developed countries has access to more finance than the low-income group. As for LRGDP, the relationship having an inverted U-shaped form is detected as a result of the analysis. This demonstrates that while economic growth distorts income distribution in the early stages, it improves income distribution in the following period. Looking at inflation (INF), its coefficient is statistically significant at 1% significance level and has a negative sign meaning that it reduces income inequality, as in the case of the financially underdeveloped countries. This can be considered as an interesting finding that the increase in inflation adversely affected the higher income group more than the

low income group in the financially developed countries as in the financially underdeveloped countries. Trade ratio (TR) has a positive and statistically significant sign at 5% significance level. This finding reveals that the wealthier people in the financially developed countries benefited more than the lower income group from international trade in this period. As for global financial crisis, which is proxied by a dummy variable, it is seen that it has a positive sign. This means that it distorted income distribution demonstrating that the global financial crisis had adversely affected the lower-income group more than the higher-income group.

To sum up, it is determined that the relationship between banking credits (BANK) and income inequality has a U-shaped form while the economic growth-income inequality nexus has an inverted-U shaped form. Inflation (INF) improved income distribution as in the case of the financially underdeveloped countries. On the other hand, as for the foreign trade (TR) and the global financial crisis, they proved to distort income distribution over the period 2000-2014 time period in the financially developed countries.

3. Discussion

Econometric findings show that financial development has non-linear and opposite effects on income inequality in the financially developed and the financially underdeveloped countries. Similarly, it is seen for these two groups that economic growth has non-linear and opposite effects on income inequality. On the other hand, while inflation in both of the country groups corrected the income inequality; the opposite effects of foreign trade volume is detected as a result of the analysis. These findings show that financial development level is an important classification instrument to measure the effects of important macroeconomic variables on income inequality.

In the financially underdeveloped country group, the increase in the credits issued to the private sector (financial development) increases income inequality up to a certain level. This is explained by the fact that the low-income group makes less use of the financial system than the high-income group. The problem of low-income people to access to the financial system is an important factor in this result. Institutional and / or legal barriers for the low-income group, easier access to banking services due to the economic power of individuals or groups with high income, and the inability of the low-income group to obtain sufficient collateral lead to only one group to benefit from the financial system, while the other group deprives. This situation increases the income inequality even more (Seven and Coşkun (2016)). On the other hand, if financial development results in excess return on capital and high returns for financial sector professionals, and if there is little benefit for the poor, then it may worsen rather than correct

income inequality (Park and Shin (2017)). These are the reasons why the financial system cannot be fully fulfilled until the financial development reaches a certain level and can be expressed as the most probable reasons for the increase in income inequality. From the perspective of financial development, it is seen that with the reaching of a certain level of credits issued to the private sector, income inequality decreases in the financially underdeveloped countries. As Kim and Lin (2011) point out, a certain level of financial development, even if low, is a prerequisite for reducing income inequality. The increase in access to the financial system after this level and the benefit of all income groups from the system can be said to be the most obvious reason for the decrease in inequality. As one of the possible reasons for this situation, Demirgüç-Kunt and Levine (2009) argue that financial development may indirectly affect income inequality by changing the composition of labor demand. If expanded financial services increase the demand for low skilled workers, the wages of low skilled workers will increase, indicating that it will contribute to a reduction in income inequality.

It was concluded that the increase in credits issued to the private sector in the financially developed country group reduces the income inequality to a certain level, but after this level, the increase in loans increased the income inequality. As this group of countries left financial underdevelopment behind , financial development offers the expected contribution in terms of income distribution at the first stage. However, in the next stage, excessive credit expansion has a negative effect on income distribution, just as it has a negative impact on growth, which is one of the most important macroeconomic indicators. Income inequality worsens as the high-income group makes greater use of excessive credit expansion than the low-income group. This result is consistent with the results of the comprehensive study of Denk and Cournede (2015) for OECD countries. As a matter of fact, Denk and Cournede (2015) clearly demonstrated that excessive financialization brought about high income inequality. Various studies show that fast and excessive growth in loans is one of the most common factors related to financial crises (Demirgüç-Kunt and Detragiache 1998; Kaminsky and Reinhart 1999). Moreover, in these countries where the ratio of credits over GDP is high, income inequality is widening due to the phenomenon of unemployment experienced as a result of the crises which may be seen as possible effects of excessive financialization. Considering that excessive credit expansion may lead to financial instability, as Seven and Coşkun (2016) pointed out, this situation adversely affects the corrective effect of financial development on income inequality.

When the financially underdeveloped and developed groups are considered together, financial development first increases the income inequality and the low-income group cannot benefit

from the financial system sufficiently due to various disruptions in this period. With the increase in financial development after this period and as a result of the deepening in the markets, income inequality decreases with financial development. This period also covers the first period of the financially developed group. We can define this period as the stage that can benefit from financial development. In the period of financially developed but excessive credit expansion, there are still increases in income inequality along with the crisis, instability and macroeconomic imbalances. In this period, just like the first stage of the financially undeveloped period, it is seen that the income groups are affected negatively from the financial development in terms of income distribution.

As for the effect of economic growth on income inequality, income inequality gets better in the first stage of the economic growth in the underdeveloped country group while income inequality deteriorates after a certain period. This result shows that Kuznets' inverted-U hypothesis is not valid in this country group, and studies supporting similar results (Kim et al., 2011; Huang, 2012; Blanco and Ram, 2019) are available in the literature. In the financially developed country group, the inverted-U hypothesis of Kuznets is confirmed by the studies such as Dawson (1997), Bahmani-Oskooee and Gelan (2008) and Thornton(2001). Accordingly, income inequality worsens in the first stages of economic growth while it recovers with growth later. Despite the fact that the Kuznets hypothesis explaining the relationship between economic growth and income inequality is popular in the literature, there is no consensus. Therefore, it is difficult to explain the results in a simple way. Investigations should be made by taking into consideration the economic conditions, sectoral structures and development conditions of the countries. As for inflation, trade volume and the global crisis, it is seen that inflation, trade volume and the global crisis reduces income inequality in the financially underdeveloped country group. On the other hand, it is concluded that the trade volume and the global crisis increase income inequality while inflation reduces it in the financially developed country group. The existence of a negative relationship between inflation and income inequality in both of these two country groups which they have single-digit inflation rate is consistent with the results of Monnin (2014). Monnin (2014) concluded that the increase in inflation had a corrective effect on income inequality during low inflation. The financial instability in the financially developed country group, which increases the income inequality of the global crisis, and the effects of excessive credit expansion in these countries, are the most important causes of the crisis. Before the crisis, the high level of financial depth in these countries can be considered to cause negative effects of the global crisis on every income group

and thus low-income groups and increase the income inequality. Since the access to finance in the underdeveloped countries is mostly in the high-income level of the population, it can be stated that this income group is affected more negatively than the low-income group and the income inequality decreases. The results of the financially underdeveloped country group that trade volume has a negative impact on income inequality are parallel to Georgantopoulos and Tsamis (2011) and Faustino and Governor (2011) studies. On the other hand, the result that the trade volume increases income inequality in the financially developed country group is compatible with the results of Tian et al. (2011) and Barusman and Barusman (2017).

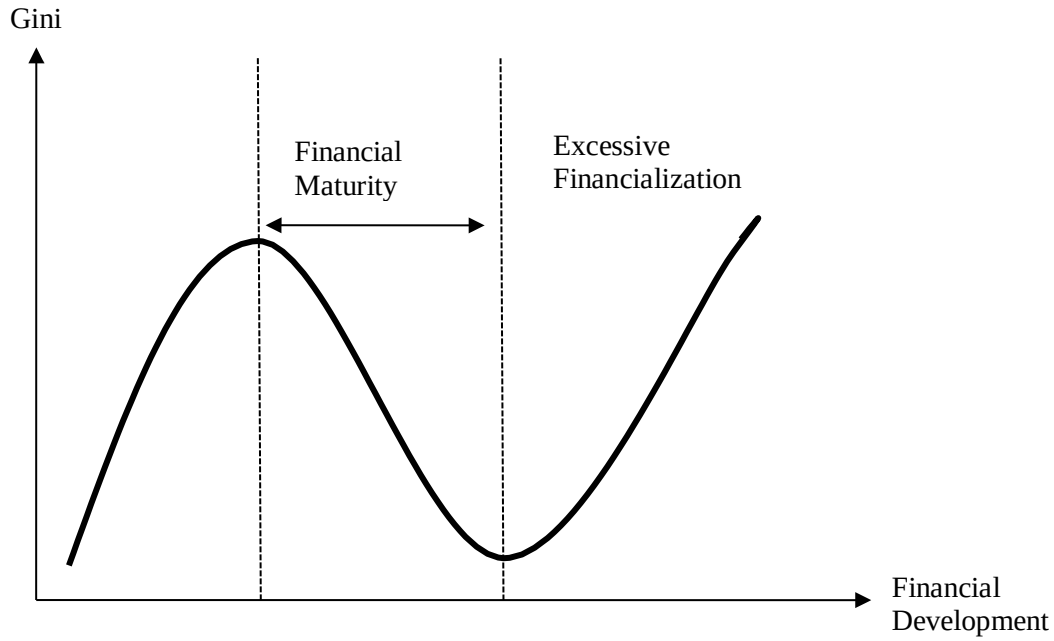
4. Conclusion and Policy Implications

The relationship between financial development and income inequality was investigated by employing two-step panel system GMM for the period 2000-2014, in this study. 52 countries are classified into two groups as financially developed and underdeveloped countries. 32 countries are determined financially underdeveloped while 20 countries are classified as financially developed countries. This distinction is made based on the work of Demirguc-Kunt and Levine (2001).

When the findings are taken into consideration, it appears that different results are remarkable for both country groups. It is demonstrated that the hypothesis U is valid for the group of financially developed countries while the inverted-U hypothesis of Greenwood and Jovanovic (1990) is validated for the financially underdeveloped countries. When the results of this study covering 52 countries and 15 years are evaluated in general, the following basic conclusions can be reached: Financial development phases can be divided into 3 periods in general. The first stage can be defined as a phase of financial underdevelopment. Typical features of this period include low financial access and high-income people making more use of this system. Financial depth is not available at this stage. Therefore, a positive relationship exists between financial development and income inequality at this stage. The second stage is the period in which financial depth accelerates while access to financial services is accelerated and financial depth increases. In this period, low income groups can get a higher share from financial development, which reduces income inequality. This stage can be called as “financial maturity”. The third phase can be defined as the period of excessive financialization in which the financial depth reached very high rates in GDP and there exists excessive credit expansion. In this period, income inequality increases with excessive financialization. Although the low-income group continues benefiting from financial services during the period of excessive financialization, it is concluded that the high-income group benefited even more. Therefore, it is observed that the

financially underdeveloped country group can be considered in the 1st and 2nd stages; while the financially developed country group can be concluded that they are in the 2nd and 3rd stages. As an overall assessment, the inverted-U shaped curve of Greenwood and Jovanovic(1990) was suggested for the period before 1990. On the other hand, the phenomenon of excessive financialization is said to be mostly observed in the post-1990 period. For this reason, the inverted-U shaped curve of Greenwood and Jovanovic (1990) can be regarded as valid for pre-1990 period. However, due to the fact that excessive financialization is mostly observed in post-1990 period, the wavy curve-shaped relationship can be regarded as valid for the entire financial development process including excessive financialization. The Figure-1 summarizes the entire process explained above.

Figure-1. Wavy Curve-Shaped Financial Development-Income Inequality Relationship



Based on these results discussed and mentioned above, we can say that countries should establish income inequality policies according to their own financial development stages and stage conditions in which they present. The following policy implications can be drawn from the analysis based on the results mentioned and discussed above:

1. When the three stages of financial development are taken into consideration, it is seen that income inequality has increased in the first and last stages, that is, the desired contribution from the financial system cannot be achieved. From this point of view, for the first stage, governments should ease the collateral requirement of the low-income group wishing to receive

services from the financial system and provide facilities for this group. The low-income group, which has been rendered serviceable from the financial system, can have access to opportunities to improve their human capital.

2. Governments should pave the way for the low-income group that cannot benefit from the banking system to benefit from the micro-finance system, which can ensure that these groups have regular income and reduce income inequality.

3. Governments in countries at the stage of excessive financialization need to refrain from financing towards excessive and inefficient areas. Restrictions on lending should also be imposed here with appropriate regulations.

4. The hidden access of the elite groups wishing to gain more shares in financial development should be prevented and transparency should be ensured.

5. In order to avoid deterioration of financial stability through excessive financialization, attention should be paid to directing credits to production and to distribute them to the benefit of large masses, and to prevent the use of certain high-income groups and utilization in unproductive areas away from production.

Further studies should increase the number of countries examined to investigate whether the results presented in this study are globally valid. Moreover, they can analyze the effects of financial development on income inequality by using other variables representing financial development other than banking credits or established financial development indexes.

References

Altintas, Nurullah. *Finansal Gelişmişlik Üzerine Bir İnceleme (in Turkish),* DORA Yayınları; An Inquiry on Financial Development, DORA Publications, 2018.[1]

Anderson, Theodore Wilbur - Hsıao, Cheng. "Estimation of Dynamic Models With Error Components". *Journal of the American statistical Association 76*/375 (1981). 598-606.

Arellano, Manuel - Bond, Stephen. "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *The Review of Economic Studies 58*/2 (1991), 277-297.

Arellano, Manuel - Bover, Olympia. "Another Look at the İnstrumental Variable Estimation of Error-Components Models". *Journal of Econometrics 68*/1 (1995), 29-51.

[1] There is no English version of this book.

Azam, Muhammad - Raza, Syed Ali. "Financial Sector Development and İncome İnequality in ASEAN-5 Countries: Does Financial Kuznets Curve Exists?". *Global Business and Economics Review 20*/1 (2018), 88-114.

Bahmanı-Oskooee, Mohsen - Gelan, Abera, "Kuznets inverted-U hypothesis revisited: a time-series approach using US data". *Applied Economics Letters 15*/9 (2008), 677-681.

Balestra, Pietro - Nerlove, Marc. "Pooling Cross Section and Time Series Data in The Estimation of a Dynamic Model: The Demand For Natural Gas". *Econometrica (pre-1986) 34*/3 (1966), 585.

Baltagı, Badi H. *Econometric Analysis of Panel Data,* 3rd edn. John Wiley:New York. (2005).

Banerjee, Abhijit V. - Newman, Andrew F. "Occupational choice and the process of development". *Journal of Political Economy 101*/2 (1993), 274-298.

Barusman, Adoni Fornio - Barusman, Yusuf Sulfarano. "The impact of international trade on income inequality in the United States since 1970's". *European Research Studies Journal* 20/4A (2017), 35-50.

Basirat, M., Ahmadi, M., & Mohammadi, M. (2016). "The study of the effect of financial market development on income distribution of selected list of developing countries". *Journal of Fundamental and Applied Sciences, 8,* 592-607.

Batuo, Michael Enowbi vd. Financial development and income inequality: Evidence from African Countries. *African Development Bank* (2010), 1-27.

Zhang, Ruixin - Naceur, Sami Ben. "Financial Development, İnequality and Poverty: Some İnternational Evidence". *International Review of Economics & Finance* 61 (2016), 1-16.

Blanco, German - Ram, Rati. "Level of Development and İncome İnequality in The United States: Kuznets Hypothesis Revisited Once Again". *Economic Modelling 80* (2019), 400-406.

Brei, Michael vd. *Financial Structure and İncome İnequality*. CEPR Discussion Papers 13330, C.E.P.R. Discussion Papers, (2018).

Posted: 2018-11

Blundell, Richard - Bond, Stephen, "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models". *Journal of Econometrics87*/1 (1998), 115-143.

Bittencourt, Manoel. "Financial development and inequality: Brazil 1985–1994". *Economic Change and Restructuring 43*/2 (2010), 113-130.

Bittencourt, Manoel at. all. "Does Financial Development Affect İncome İnequality in the US States?". *Journal of Policy Modeling* 41/6 (2019), 1043-1056.

Canavıre-Bacarreza, Gustavo J. - Rıoja, Felix K. "Financial Development and the Istribution of Income in Latin America and the Caribbean". (2008).

Castelló-Climent, Amparo. "On the Distribution of Education and Democracy". *Journal of Development Economics 87*/2 (2008), 179-190.

Chen, Wang - Kinkyo, Takuji. "Financial Development and Income İnequality: Long-Run Relationship and Short-Run Heterogeneity". *Emerging Markets Finance and Trade 52*/3 2016), 733-742.

Clarke, George R. at all. "Finance and income inequality: what do the data tell us?". *Southern Economic Journal*, (2006). 578-596.

Dawson, P. J. "On Testing Kuznets' Economic Growth Hypothesis". *Applied Economics Letters 4*/7 (1997), 409-410.

DE HAAN, Jacob - STURM, Jan-Egbert. "How development and liberalisation of the financial sector is related to income inequality: Some new evidence". *BAFFI CAREFIN Centre Research Paper* (2016). (2016-33).

Demirgüç-Kunt, Aslı - Levine, Ross. (Eds.). *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development*. MIT press (2001).

Denk, Oliver, - Cournède, Boris. "Finance and income inequality in OECD countries". *Available at SSRN 2649944*, (2015).

Faustıno, Horácio C. - Valı, Carim. "The Effects of Globalization on OECD Income Inequality: A Static and Dynamic Analysis" Working paper 12. (2011).

Galor, Oded - Zeıra, Joseph. "Income distribution and macroeconomics". *The Review of Economic Studies 60*/1 (1993), 35-52.

Georgantopoulos, Andreas G. - Tsamıs, Anastasios. "The İmpact of Globalization on İncome Distribution: The Case Of Hungary". *Research Journal of International Studies 21* (2011), 17-25.

Greenwood, Jeremy - Jovanovıc, Boyan. "Financial development, growth, and the distribution of income". *Journal of political Economy 98*/5, Part 1 (1990), 1076-1107.

Guillen, Jorge. "Does Financial Openness Matter in the Relationship Between Financial Development and Income Distribution in Latin America?". *Emerging Markets Finance and Trade 52*/5 (2016), 1145-1155.

Hamorı, Shigeyuki - Hashıguchı, Yoshihiro. "The Effect of Financial Deepening on İnequality: Some İnternational Evidence. *Journal of Asian Economics 23*/4 (2012), 353-359.

Huang, Hiung-Ju. "Corruption, Economic Growth, and İncome İnequality: Evidence from Ten Countries in Asia". *World Academy of Science, Engineering and TechnolnICRG, 66* (2012), 354-358.

Kım, Dong-Hyeon - Lın, Shu-Chin. "Nonlinearity in the Financial Development–İncome İnequality Nexus". *Journal of Comparative Economics 39*/3 (2011), 310-325.

Jobarteh, Mustapha - Kaya, Huseyin. "Revisiting financial development and income inequality nexus for Africa". *African Finance Journal 21*/1 (2019), 1-22.

Jauch, Sebastian - Watzka, Sebastian. "Financial Development and İncome İnequality: A Panel Data Approach". *Empirical Economics 51/1* (2016), 291-314.

Kim, Dong-Hyeon - Lın, Shu-Chin. "Nonlinearity in The Financial Development–İncome İnequality Nexus". *Journal of Comparative Economics 39/3* (2011), 310-325.

Kappel, Viven. "The effects of financial development on income inequality and poverty". *CER-ETH-Center of Economic Research at ETH Zurich, Working Paper*, (2010), (10/127).

Mansour, Mohamed Salah - Wendel, Miria ."Finance and Inequality Evidence from East Asia". *Eurasian Journal of Economics and Finance 3/3* (2015), 1-16.

Mıllımet, Daniel L. - Mcdonough, Ian K. "Dynamic Panel Data Models With Irregular Spacing: With an Application to Early Childhood Development". *Journal of Applied Econometrics 32/4* (2017), 725-743.

Monnin, Pierre. "Inflation and income inequality in developed economies". CEP Working Paper Series (2014).

Mookerjee, Rajen - Kalipioni, Paul. "Availability of Financial Services and İncome İnequality: The Evidence from Many Countries". *Emerging Markets Review 11/4* (2010), 404-408.

Najarzadeh, Reza. at all. "Does the Internet İncrease Labor Productivity? Evidence from a Cross-Country Dynamic Panel". *Journal of Policy Modeling 36/6* (2014), 986-993.

Nasreddine, Kaide - Mensi, Sami. "Financial Development and Income Inequality: The Linear versus the Nonlinear Hypothesis". *Economics Bulletin 36/2* (2016), 609-626.

Nikoloski, Zlatko. "Financial sector development and inequality: is there a financial Kuznets curve?". *Journal of International Development, 25/7* (2013), 897-911.

Paramati, Sudharshan Reddy - Nguyen, Thanh Pham Thien. "Does Financial Market Growth İmprove İncome Distribution? A Comparison of Developed and Emerging Market Economies of the Global Sample". *International Journal of Finance & Economics 24/1*(2019), 629-646.

Park, Donghyun - Shın, Kwanho. "Economic growth, financial development, and income inequality". *Emerging Markets Finance and Trade 53/12* (2017), 2794-2825.

Roodman, David. "A Note on the Theme of Too Many İnstruments". *Oxford Bulletin of Economics and statistics 71/1* (2009a), 135-158.

Roodman, David. "How to Do Xtabond2: An İntroduction to Difference and System GMM in Stata". *The Stata Journal 9/1* (2009b), 86-136.

Sehrawat, Madhu - Giri, Ak. "Financial Development and İncome İnequality in India: An Application of ARDL Approach". *International Journal of Social Economics 42/1* (2015), 64-81.

Seven, Unal - Coskun, Yener. "Does Financial Development Reduce İncome İnequality and Poverty? Evidence from Emerging Countries". *Emerging Markets Review 26 (2016),* 34-63

Solt, Frederick. "Measuring Income Inequality Across Countries and Over Time: The Standardized World Income Inequality Database." SWIID Version 8.1, May 2019

Soto, Marcelo. "System GMM Estimation With a Small Sample". *UFAE and IAE Working Papers 780.09 (2009)*

Tian, Xiaofei. at all. "The Impact of Economic Globalization on Income Distribution: Empirical Evidence in China." *Economics Bulletin,* 4/35 (2008), 1-8.

Tıta, Anthanasius Fomum - Azıakpono, Meshach Jesse. "Financial Development and İncome İnequality in Africa: A Panel Heterogeneous Approach". *Cape Town: ERSA Working Paper, 614* (June 2016).

Thornton, Jhon. "The Kuznets İnverted-U Hypothesis: Panel Data Evidence from 96 Countries". *Applied Economics Letters 8/1* (2001), 15-16.

Windmeijer, Frank. "A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators". *Journal of econometrics 126/1* (2005), 25-51.