FINANCE, GROWTH AND INCOME DISTRIBUTION*

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Abstract

The study primarily aims to discuss the direct and growth-based indirect theoretical effects of financial capitalism on income inequality. The study secondly aims to investigate these possible effects of finance upon income distribution for the period of 1996-2016 through linear and nonlinear panel data models for an aggregate sample of developed and developing countries. For this purpose, financial liberalization, and financial development as its outcome are used as indicators of finance. Gini coefficient is used for a measure of inequality in income distribution. Empirical findings provide strong evidence that an increase in financial development does not improve income distribution. On the other hand, there is no evidence that the indicator measuring the financial liberalization alleviate income inequality. Such that, coefficient of the rules-based *de-jure* indicator is positive but insignificant. Finance-inequality linkage is affected by economic growth as a significant mediator indicator, but not as an intermediary for inequality mitigating.

Keywords: Finance, inequality, growth, generalized method of moments, threshold regression approach

Jel Classification: C3, D3, G0, O4

Öz

Çalışma birincil olarak, finansal kapitalizmin gelir eşitsizliği üzerindeki etkilerini doğrudan ve dolaylı teorik açıklamalar çerçevesinde tartışmayı amaçlamaktadır. İkincil olarak ise finansın gelir dağılımı üzerindeki olası etkilerini 1996-2016 dönemi için doğrusal ve doğrusal olmayan panel veri modelleri ile gelişmiş ve gelişmekte olan ülkelerden oluşan bir örneklem için araştırmayı amaçlamaktadır. Bu amaçla, finansal liberalizasyon endeksi ile onun bir çıktısı olarak finansal gelişme göstergelerinden yararlanılmıştır. Gelir dağılımında eşitsizlik ölçütü olarak ise Gini katsayısı kullanılmaktadır. Ampirik bulgular finansal gelişmenin gelir dağılımını iyileştirmediğine dair güçlü kanıtlar ortaya koymaktadır. Diğer yandan, finansal liberalizasyon göstergesinin gelir eşitsizliğini azalttığına ilişkin bir kanıt elde edilememiştir. Öyle ki, kurallara dayalı *de-jure* göstergenin katsayısı pozitif ve fakat istatistiki olarak anlamsızdır. Finans-eşitsizlik bağlantısı anlamlı bir aracı gösterge olan ekonomik büyümeden etkilenmekte, fakat bu aracı etki finansın gelir dağılımını bozucu etkisini ortadan kaldırmamaktadır.

Anahtar Kelimeler: Finans, eşitsizlik, büyüme, genelleştirilmiş momentler metodu, eşik regresyon yaklaşımı

Jel Sınıflandırması: C3, D3, G0, O4

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1. Introduction

In the last few decades, the increase in within-country inequality around the world (see Figure 1) has brought many discussions in the context of the effects of financial capitalism; since the concentration of financial capital around the world has almost been a simultaneous process with the observed increase in income inequality. A similar of such concentration and increase in inequality measured as top income shares have been observed in the United States especially during the 1929 Great Depression period.[3] Therefore, this period is referred to as a period in which capitalism has re-financialized as a consequence of the second wave of financial liberalization after the 1980s.

As depicted in Figure 1, income inequality in the world has increased to a new average after the 1980s. Stockhammer (2015) pointed to the increased inequality –measured with different methods- in developed countries as a whole since the early 1980s. Inequality has tended to decrease until the 1980s in accordance with the forecasts of well-known *Kuznets curve*, then reversed to rise. Net and gross income distribution has deteriorated specifically in Anglo-Saxon countries which are among the countries that first adopted neoliberal economic policies. In Scandinavian countries and Netherlands, there was a reversal from low to high levels of inequality. Japan has abandoned its former egalitarian and lifelong employment system and entered a period of high inequality and long stagnation, notably in 1980s and 1990s. In Germany and France, distinctly, high unionization rates, high minimum wages and centralized wage-setting systems partially prevented an increasing trend in inequality. Even so, the most striking reversal in inequality has been realized with the transition of old planned economic systems to a market system. While the rise in income inequality in Central Europe has been more moderate since 1989, there were 10-20 points[4] increase in Gini coefficient in former Soviet Union and Southeast European countries (Cornia, 2004). However, differences by regions have been observed in other developing countries, rather than a common trend. For example, although rises in 2000s have turned into a decline recently in Latin America, Latin America is still the geographical region with

[3] Beginning in 1929, income distributed as to make the system vulnerable against economic shocks. This was due to the fact that distribution of income was seriously unfair, rather than the American economy not having sufficient purchasing power to meet production. Income shifted to profits that will not turn into purchasing power quickly, to very high individual earnings and to increases in business volume, rather than labor, whose purchasing power was high and earnings would rapidly turn into consumption. This meant more capital accumulation, not consumption expenditures. As a matter of fact, workers' lack of demand in the agricultural sector and other sectors was due to the restriction of their purchasing capacities. In other words, the failure to distribute the gains from productivity into low-income groups has increased the income of those whose marginal propensity to consume was lower (Heilbroner and Milberg, 2012).

[4] The range of Gini coefficient is 0-100.

the highest inequality level around the world. Nevertheless, relevant researches on developing countries have been more scarce so far.

In addition to worsening personal income distribution, deregulation of labor markets by means of neoliberal financial *deregulation* policies in the form of more flexible labor markets, repression in wages and policies against unionization also limit bargaining power of labor and thus lead to lower wages which appear to increase income inequality in terms of functional distribution. Indeed, OECD and ILO (2015) have reported a substantial decrease in income share of wages in G20 countries recently. Figure 2 reveals that for OECD countries, while the share of labor income in Gross Domestic Product (GDP) was about 64% in 1980, this share was 52% in 2017. What is striking in this figure is the dramatic decline in the labor income share of GDP which is approximately 18% between the two periods. Due to the declining labor shares, advances in macroeconomic performance may not been transformed into proportional improvements in household incomes (Atkinson, 2009).

Figure 1: World average of Gini coefficient (1963-2014)

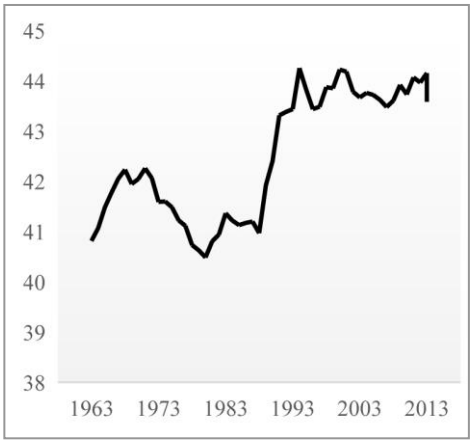
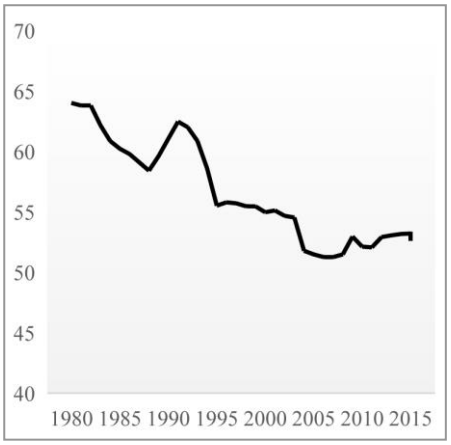


Figure 2: Average labor income share as percent of GDP in OECD countries (1980-2017)



Source. (Figure 1) University of Texas Inequality Project Estimated Household Income Inequality (UTIP-EHII). **Source.** (Figure 2) Annual Macroeconomics Database (AMECO) and ILO (2018)

Notes. (Figure 1) The range for Gini coefficient is from 0 to 100. The average is estimated for 154 countries.

In the same vein, Piketty and Saez (2013) state that the share of labor income decreased and the share of capital income increased in both the 1929 Great Depression and the 2008 global financial crisis period. Besides, for example, as the percentage that receives the highest share from income shrinks from Top 10 to Top 0.1 %, the income of the labor decreases while the capital income increases.

Hence, searching for the financial dynamics of inequality which has social, political and economic consequences has an increasing importance in this context. Since the issue of how within-country income inequality is influenced by financial capitalism is still standing as an ambiguous issue, and also indirect link regarding economic growth has been neglected so far, our study aims to contribute to literature from these aspects.

The study is organized as follows. Section 2 is devoted to theoretical underpinnings and Section 3 to empirical literature. Data and variables are described in the fourth section while method and the model is introduced in the fifth section. In section 6, empirical results are presented and the study is brought to a conclusion in the last section.

2. Theoretical Arguments

The analysis process of financial and economic development of which theoretical foundations were established by Joseph Schumpeter[5], continues with McKinnon-Shaw financial development approach and has been expanded for more countries by King and Levine (1993) as a representative study in the empirical literature. They argue that financial depth is at the core of growth, in other words, financial repression hinders economic growth. According to McKinnon (1973) and Shaw (1973)'s financial development approach, withdrawal of the government from interest rate regulations and bank ownership, and consequently higher interest rates for deposits will allow financial systems to reach higher saving levels. From a macroeconomic perspective, this will enable higher growth and more rational use of savings in the long term. Although there is a vast and established literature on finance-growth linkage, distributional impact of finance is still a controversial issue.

[5] In connection with the Schumpeterian *creative destruction* process, financial intermediaries materialize technological innovation and contribute to economic development. As a supporter of the supply-led approach, Schumpeter put forward the debate that services provided through financial intermediation - mobilization of savings, evaluation of projects, risk management, monitoring of managers, facilitation of transactions - are required for technological innovation and economic development (King and Levine, 1993)

Neoclassical arguments put emphasis on access to financial services in explaining the effects of financial development on inequality. When financial development functions in an 'inclusive' context, individuals' access and use of financial services increase who have not been able to benefit from such services due to price and other barriers. Therefore, financial development may expand the opportunities of disadvantaged groups and decrease intergenerational persistence in relative income. On the other hand, when finance functions in an 'intensive' context, it may lead to increased access to financial services, mostly for high-income individuals and strong firms who have already taken part in the financial system (Demirgüç-Kunt and Levine, 2009). According to some pioneer studies, financial development prevents financial market failures thereby the collateral problem and dependency on wealth may disappear. (Banerjee and Newman, 1993; Galor and Zeira, 1993). Besides, Greenwood and Jovanovic (1990) analyzed two different issues related to economic growth and income distribution, and also the link between financial structure and economic development within a single model. The model predicts that in the initial stages of economic development, credit market failures allow those who have a sufficient level of wealth to benefit from financial services through high transaction costs. When the financial system reaches a certain level of maturity over time, transaction costs of those benefiting from financial services decrease and access of a wider segment of the society might be provided. Therefore, an inverse U-shaped relationship namely financial Kuznets curve is predicted between financial development and inequality.

The source of the neoclassical view regarding indirect mechanisms of finance-inequality nexus may be attributed to the literature analyzing cause and effect relations between developed financial systems and economic growth. On the basis of the presupposition that financial liberalization generates economic growth, growth might reduce inequality by directly benefiting the sectors with low-income groups or the factors of production in these sectors. On the other hand, growth may also indirectly benefit the poor by providing necessary sources to implement redistribution policies such as taxation, transfers and public expenditures. In his pioneer work Kuznets (1955) postulates that an inverted U shaped relationship exists between economic development and income inequality. To put it more explicitly, in the early stages of economic development, a positive relationship will be observed between growth and inequality. As more people move into the industrial sector, the decrease in supply in the agricultural sector will raise wages in this sector. Those in the industrial sector will have to work harder to reach the income of richer employees. In the later stages of development, inequality will decrease and the positive relationship between economic development and inequality will turn into negative (Kuznets, 1955; Barro, 2000). In today's world, Kuznets curve might be reflecting the effects of transition from a finan-

cially unsophisticated and shallowed environment to a system where financial capital is concentrated. Therefore, the decrease in the share of the industrial sector and the increase in the share of the financial services might be regarded as the new Kuznets phase after the 1980s.

Arestis and Caner (2005) state that the effects of finance on growth and income inequality depend on the institutions and policies associated with liberalization, initial income inequality and changes in growth-based distribution. As a mediator mechanism in the link between finance and income inequality, the 'trickle-down effect' has also been discussing. Accordingly, wealth accumulation of high-income people will benefit the poor with the relevant trickle-down effect and enable them to obtain funds for investment purposes. Woo (2017) clarifies the rationale behind the so-called effect as of the rich will use their wealth to invest in new resources, in turn provide more employment, higher wages and technological innovation. Aghion and Bolton (1997) relatedly argue that if the capital accumulation is high enough, equal opportunity will be provided by the wealthy savers lending to the lower and middle income groups in the population. In addition, redistribution effects will increase the efficiency in the economy by making the poor borrow less to make their investments, ensuring that incentives required to increase their profits are available and trickle-down effect becomes stronger. It is also pointed out by Giné and Townsend (2004) that financial development will stimulate growth and form the demand structure in the labor market positively. According the authors, financial liberalization and associated increase in access to credit explain the rapid growth in per capita GDP in Thailand. Increase in access to financial services also enhance growth and labor demand. According to the model they set up, although initially gains are concentrated in a small segment of the population, a large number of working class will benefit from employment and wage increases in the long run by starting and expanding businesses via increased access to credit.

On the other hand, common wisdom on the 'pro-poor growth' and that growth has poverty-reducing effects stand out with the study of Dollar and Kraay (2002). They concluded that economic growth benefits all segments of society in the same way, and that growth in income is proportionately related to the growth in income of the poorest 10%. On the contrary, 'inequality possibility frontier' approach[6] of Milanovic (2016) shows that an increase

[6] *Inequality possibility frontier* is defined by Milanovic, Lindert and Williamson (2010). Under the assumption that each society distributes income in a way that guarantees a minimum of subsistence for poor citizens, remaining income will constitute the surplus for richer segments. If the average income is too low and/or slightly above the minimum subsistence level, inequality will also be low. But as the average income increases, this restriction in inequality will disappear; surplus income will rise consistent with that high average income, possible maximum inequality will be higher. In other words, maximum inequality will be an increasing function of average income.

in average income is associated with higher inequality compared to stagnant income. According to the average income and inequality series Milanovic (2016) studied for United States, United Kingdom, Spain, Italy, Germany, Netherlands, Brazil, Chile and Japan, Kuznets hypothesis has been able to explain the inequality-income relationship until the late 1970s, but the theoretical link has been disconnected for the past 30-40 years. Therefore, it is not sufficient to explain inequality solely with economic forces shaped by supply and demand mechanisms; political and social forces should also be taken into account.

The relationship between growth and distribution is one of the main research topics also in Post-Keynesian economics literature within the framework of Cambridge income distribution theory. The Cambridge theoretical approach was originally developed by Kaldor (1957). It mainly focuses on the role of aggregate demand in income distribution. The main idea in this theory is that the adjustment of aggregate demand to full employment level could be achieved by adjustment of the income distribution. Bhaduri and Marglin (1990), who have examined the growth-distribution relationship following Kalecki, regarded income distribution as an adjustment variable that facilitates moving towards equilibrium growth rate. As two components of income, an increase in profits and a decrease in wages create inequality in income distribution. From a demand-side approach, an increase in wage share will increase aggregate demand, capacity utilization, investments and therefore employment; which will then lead to higher growth under the wage-side demand regime that will improve income distribution. Therefore, the economic growth caused by the wage regime is linked to lower inequality.

However, Kalecki argues that the workers usually do not save, and that the tendency of capital earners to save is higher than of wage earners (Lavoie and Stockhammer, 2012). Pasinetti (1962) also includes the concept of class by analyzing the share of capitalists and workers out of income and the aggregate demand effect of different saving trends. Therefore, the model assumes different propensities to save of profit and wage earners, and refers to a conflict between growth and equality in income distribution. The relatively lower propensity to save of wage earners is associated with an inequality in income distribution (Palley, 2005).

3. Empirical Literature Review

Results obtained from various empirical studies on the effects of financial liberalization or financial development on income inequality do not provide much evidence that the relationship depends on the economic development level of country groups. There is no doubt that variety of methods, periods, samples, indicators of finance and inequality and control variables differentiate the results.

First econometrical analyses on the subject date back to the early 2000s. Merely a few studies have been within our knowledge in which the mediatory effect of growth in finance and inequality nexus has been taken into account in the empirical literature, thereby we expect to contribute to the literature in this regard. By classifying the studies in reference to the direction of the effects of finance on inequality; a summary literature describing the sample and the period considered, the method(s) applied and the results obtained in the analyses is presented in Table 1.

Table 1: Summary of Single or Multi-Country Empirical Studies

Study	Sample, period of the study	Method[7]	Result(s)
Studies supporting the pro-inequality role of finance			
Das and Mohapatra (2003)	11 emerging markets; 1986-1995	Regression and event analysis	Distribution of income deteriorates after capital market liberalization.
Roine, Vlachos and Waldenström (2007)	16 developed countries; 20th century	GLS	Financial development increases income share of top 1%.
Asteriou, Dimelis and Moudatsou (2014)	27 European Union countries; 1995-2009	FE, RE, GMM	Financial globalization, measured by foreign direct investment, capital account openness and stock market capitalization, increases inequality.
Furceri and Loungani (2015)	179 developed and developing countries; 1970-2010	SLS, Impulse-response functions	Capital account openness increases inequality. Financial development and crises play a key role in the response of inequality to liberalization.
Cabral, Garcia-Diaz and Mollick (2016)	12 developed, 3 developing countries; 1970-2004	GMM	Financial integration has the largest impact on the people with highest income share and increases income concentration.
Seven and Coşkun (2016)	45 developing; 1987-2011	EKK, GMM	Developments in banking sector increases inequality.
De Haan and Sturm (2017)	121 countries; 1975-2005	FE	Financial liberalization, financial development and financial crises increase income inequality.
De Haan, Pleninger and Sturm (2018)	89 countries; 1975-2005	FE	Financial liberalization and financial development increase income inequality.
Studies supporting the inequality-reducing role of finance			
Beck, Demirgüç-Kunt and Levine (2007)	72 developed and developing countries; 1960-2005	EKK, GMM	Financial development increases the income of the poor faster than average GDP per capita, thereby reduces income inequality.
Odhiambo (2009)	South Africa; 1960-2006	Granger causality	Both financial and economic development have been found to be the Granger cause of poverty reduction.
Ang (2010)	India; 1951-2004	ARDL	Underdevelopment of financial system affects low-income households more and increases income inequality.
Mookerjee and Kalipioni (2010)	65 countries; 2000-2005 average (cross section)	SLS, IV	Developments in access to financial services have an impact on improving income distribution.

[7] SLS: Least squares method; 2SLS: Two-stage SLS; GLS: Generalized SLS; GMM: Generalized Method of Moments; FE: Fixed effects model; IV: Instrumental variables approach; RE: Random effects model; ARDL: Autoregressive Distributed Lag; PMG-CA: Pooled Mean Group Co-integration Analysis; PSTR: Panel Smooth Transition Regression

Table 1 (continues)

Agnello, Mallick and Sousa (2012)	62 developed and developing countries; 1973-2005	FE	Financial reforms generally provide a fair distribution of income.
Li and Yu (2014)	18 Asian countries	FE, GMM	Removal of credit controls, improvement of banking regulations and stock market development are associated with lower inequality.
Dhrifi (2015)	22 low-income, 37 middle-income, 30 high-income countries; 1990-2010	Simultaneous equations model	Financial development promotes economic growth and leads to less (more) poverty in middle and high-income (low income) countries. Financial development decrease (increase) inequality in high-income countries (middle and low-income countries)
Bayar (2017)	Emerging market economies, 1993-2012	Pesaran and Yamagata (2008) co-integration method	There is a long-term relationship between financial development and poverty, and financial development reduces poverty.
Studies on nonlinear effects of finance on inequality			
Jalilian and Kirkpatrick (2005)	42 developed and developing countries; 1960-1995	2SLS	The effect of financial development on inequality and poverty is inverted U shaped, and this effect is realized through growth in per capita income.
Kim and Lin (2011)	65 countries; 1960-2005	IV Threshold regression method, GMM	In the regime where the level of financial development is high, financial development reduces inequality.
Tan and Law (2012)	35 developing countries; 1980-2000	GMM	Financial development after a threshold level worsens income distribution.
Kunieda, Okada and Shibata (2014)	120 developed and developing countries; 1985-2009	EKK, GMM	As the degree of financial integration increases, financial development creates inequality; as the level of financial development increases, financial openness creates an inequality increasing effect.
Lin, Kim and Lee (2015)	42 developed and developing countries; 1976-2005	PSTR	Inequality increasing effect of FDI is strengthened by an increase in the level of financial development.
Jauch and Watzka (2016)	138 developed and developing countries; 1960-2008	FE, GMM	In line with Greenwood and Jovanovic (1990), financial Kuznets curve is valid.
Bumann and Lensink (2016)	106 countries; 1973-2008	GMM	Capital account liberalization increases inequality more in countries with lower financial depth.
Liu, Liu and Zhang (2017)	China; 1996-2012	GMM, Threshold regression method	While the impact of stock market development on inequality is linear, banking sector development creates an inverted U effect.
Furceri and Loungani (2018)	149 countries; 1970-2010	Impulse-response functions, ARDL, Weighted SLS and GMM	Financial development and financial liberalization reduce inequality.

4. Data and Variables

In the study, 1996-2016 period annual observations are used for the set of 52 developed and developing countries.[8] Net Gini coefficient from Standardized World Income Inequality Database (SWIID) assembled by Solt (2016) is employed as the dependent variable. Domestic credits to private sector (credit) are used to measure the level of financial development. It excludes credits from central banks, development banks, public sector, state-owned enterprises; so includes credits transferred from savers to financial and private sector (households and firms). In this sense, it is considered advantageous than others in terms of measurement of financial intermediation (de Haan and Sturm, 2017, p.6).

As of *de-jure* financial liberalization indicator (finopen), financial openness index (ka-open) constructed by Chinn and Ito (2008) is used which is the most comprehensive and one of the most frequently used (e.g. Arestis and Caner, 2010; Qin and Luo, 2014; Batuo and Asongu, 2015) among other de-jure indicators. Additionally, as a *de-facto* financial liberalization indicator, a financial openness indicator recommended by Lane and Milesi-Ferretti (2007) is utilized of which is also used by Suzuki (2014) and Lin et al. (2015). They have estimated equity and foreign direct investment (fdi) stocks by adapting direct investment inflows as to reflect the prices in the financial markets and changes in exchange rates.

In addition to these main variables, all main and control variables, their definitions and data sources are listed in Appendix Table A1.

5. Methodology and Econometric Model

Three stages are planned for the analysis process of the study. Initially, base inequality models are estimated to determine the role of finance on income inequality via an instrumental variables dynamic panel data approach. Then, interaction terms are used to estimate possible interactive effects of growth with finance in determining finance-inequality nexus. Lastly, panel threshold regression analysis is conducted to see whether if nonlinearity exists in the mediatory effect of growth.

Generalized method of moments (GMM) is generally applied in estimations that use the generalized instrumental variables procedure developed by Hansen and Singleton (1982) and is in connection with the instrumental variables approach. While maximum likelihood

[8] See Appendix A – Table A2 for the country list.

method is highly effective among consistently and asymptotically normal distributed estimators, GMM does not require such restrictive assumptions regarding the distribution or data generating process to ensure effectiveness (Greene, 2003). GMM is appropriate where economic information on moment conditions is given. It is effective when certain moment conditions are fulfilled. The moment condition is the instrumental variable vector being orthogonal to the error terms; in this sense, estimation is consistent when the instrumental variables are valid (Hall, 1993). In case of a model specified with R moment conditions set is taken into consideration and f is a vector function with R element (Verbeek, 2004, p.150):

$$E\{f(w_t z_t \theta)\} = 0$$

where θ is a K-dimensional vector with all unknown parameters, w_t is the vector of observable endogenous or exogenous variables, and z is the vector of instrumental variables. θ is estimated by:

$$g_T(\theta) = \frac{1}{T}\sum_{t=1}^{T} f(w_t z_t \theta)$$

When the number of moment conditions R is equal to the number of unknown parameters K, it is possible to set R elements to zero in the equation and solve it for θ to obtain a single consistent estimator (Verbeek, 2004). If the moment conditions are a system of equations with one corresponding for each instrument, unknown parameters in these equations are the coefficients of each explanatory variable. If the instrumental variables are more than the explanatory variables which means the equations will be more than unknown parameters, then the system will not be able to solved (Roodman, 2009). Instead, the estimator is chosen so that the sample moments vector is as close to zero as possible, in a sense, a quadratic form is minimized in $g_T(\theta)$. The solution to this problem gives the generalized method of moments or the GMM estimator, $\hat{\theta}$ (Verbeek, 2004).

Arellano and Bover (1995) and Blundell and Bond (1998), on the other hand, put forward an additional assumption that the first differences of instrument variables are uncorrelated with fixed effects. In this direction, they developed a more effective GMM estimator (Roodman, 2009). Due to multiple equations consisting of original and transformed equations that are set in this estimation procedure, the efficient estimator is called as system-GMM (SGMM). The justification for the method preference is based upon the structure of variables taken. Since income inequality indicator tends to change slowly over time, a dynamic analysis is required. Additionally, unlike single equation regression analysis,

multiple equation estimations provided by SGMM could account for the presence of endogeneity issue among certain variables.

In line with the theoretical background of the analysis method, the core econometric model to be estimated by SGMM is as follows:

$$Gini_{i,t} = \alpha_i + \tau_t + \rho Gini_{i,t-1} + \beta_1 credit_{i,t} + \beta_2 finopen_{i,t} + X_{i,t}{}'\gamma_n + \varepsilon_{i,t}$$

Here, sub-indices *i* and *t* represent countries and years (i = 1, ..., 52; t = 1996, ..., 2016). α_i and τ_t are country (cross-section) and time effects respectively, while $\varepsilon_{i,t}$ is the error term. ρ, β_1 and β_2 measure relative effects of *lagged Gini*, *credit* and *finopen* on income inequality, respectively. $X_{i,t}$ is a matrix of explanatory variables referring to the set of control variables described in Appendix. Also, internal and external instruments are used. Based on the literature, one lagged of *credit* is considered as the indicator that affects endogenous variable as an internal instrument, an index measuring legal system and property rights is preferred as an external instrument. It is argued that the implementation of legal systems, property rights and protection of investors' legal rights will promote financial development (Kim and Lin, 2011).

Panel threshold regression analysis, on the other hand, is a nonlinear estimation method for panel data models. This model, proposed by Hansen (1999), defines jumping character or structural break in the relationship between variables. Although threshold models are widely used in time series analysis, their use in panel data is limited. The single parameter-threshold regression model is defined by the following function:

$$y_{it} = \alpha_i + \tau_t + X_{i,t}\,(q_{it} < \lambda)\beta_1 + X_{i,t}\,(q_{it} \geq \lambda)\beta_2 + \varepsilon_{i,t}$$

Here, q_{it} is threshold variable and λ is unknown and threshold parameter that separate the sample into two regimes or groups with coefficient β_1 and β_2. Estimating the threshold effect is the same as testing whether the coefficients are same for both regimes. In addition, bootstrap critical values of F statistics are used to test the significance of the threshold effect (Wang, 2015).

6. Results

SGMM estimation results for base inequality models are rendered in Table 2. According to Table 2, Reg.1 and 3 contain all explanatory variables while Reg.2 and 4 contain only variables which are statistically significant in the models preceding them. The findings obtained reveal a significant and approximately proportionate effect of lagged dependent variable on income inequality. This finding supports the rationale for a dynamic analysis method.

Table 2: Estimation Results: *Base Models* (SGMM)

Model: $Gini_{i,t} = \alpha_i + \tau_t + \rho Gini_{i,t-1} + \beta_1 credit_{i,t} + \beta_2 finopen_{i,t} + X_{i,t}{}' \gamma_n + \varepsilon_{i,t}$				
Variables	Reg.1	Reg.2	Reg.3	Reg.4
L.gini	0.965***	0.817***	0.944***	0.904***
	(0.045)	(0.065)	(0.042)	(0.029)
credit	**1.336*** **	**0.998*** **	**1.100*** **	**1.079** **
	(0.444)	(0.356)	(0.401)	(0.445)
kaopen	**0.064**	**0.338**		
	(0.100)	(0.210)		
fdi			**0.581**	**0.972** **
			(0.442)	(0.403)
pcinc	-0.036***	-0.006	-0.048***	-0.049**
	(0.012)	(0.010)	(0.017)	(0.020)
growth	**0.045*** **	**0.052** **	**0.045*** **	**0.027** *
	(0.015)	(0.022)	(0.016)	(0.016)
trade	0.480*	0.576	-0.182	
	(0.262)	(0.475)	(0.607)	
govt	0.491		0.485	
	(0.344)		(0.359)	
hc	0.647		0.492	
	(0.479)		(0.397)	
inf	0.018***	0.103	0.013*	0.012
	(0.007)	(0.065)	(0.007)	(0.02)
inst	-1.613***	-1.620**	-1.390***	-1.420***
	(0.447)	(0.712)	(0.388)	(0.502)
indva	-2.168**		-0.846	
	(0.997)		(1.233)	
tfp	1.411*	0.34	1.290**	1.228*
	(0.735)	(0.868)	(0.626)	(0.735)
labreg	0.085		0.058	
	(0.109)		(0.106)	
crisis	-0.12		0.086	
	(0.096)		(0.179)	
Observations	1036	1036	1036	1036
Wald Chi2-test	124773.23 [0.000]	70666.02 [0.000]	94289.80 [0.000]	91469.24 [0.000]
Hansen-J stat.	3.37 [0.338]	0.01 [0.937]	3.78 [0.287]	3.02 [0.221]
AB AR(1) test	-2.09 [0.037]	-1.15 [0.249]	-1.18 [0.238]	-1.22 [0.221]
AB AR(2) test	-1.14 [0.252]	-1.05 [0.292]	-0.93 [0.352]	-1.66 [0.097]
Instrumental variables	17	10	17	10

Notes: i. Robust standard errors are in round parentheses, p (probability) values of test statistics are in square parentheses. **ii**. *** p<0.01, ** p<0.05, * p<0.1 **iii.** The lag limits validating instrumental variables are (1 1) for Reg.2 in level and difference equations, respectively; and (1 2) in all other regression models.

Contrary to studies concluding that domestic credits as a measure of financial development reduce inequality (e.g. Jalilian and Kirkpatrick, 2005; Beck et al., 2007; Odhiambo, 2009; Kim and Lin, 2011) or the studies found that domestic credits indirectly decrease inequality (e.g. Bumann and Lensink, 2016; Furceri and Loungani, 2018), results for base models in Table 2 reveal that credit expansion does not improve income distribution. Moreover, coefficients of financial openness/liberalization, represented by kaopen or fdi stock is positive similar to some studies (e.g. Arestis and Caner, 2010; Furceri and Loungani, 2018); however they are insignificant except for Reg.6 in which fdi is the financial liberalization measure.[9] There is evidence that an increase in per capita income (pcinc), institutional quality (inst) and industry value-added (indva) decreases inequality at least 5% significance level. According to the findings, effects of trade, inflation rate (inf), total factor productivity (tfp), human capital (hc), labor market deregulations (labreg) do not have a significant impact to alleviate income inequality. These effects are only significant for the coefficients of inf, tfp and govt, in some models. Likewise, dummy variable for global financial crisis, contrary to Asteriou et al. (2014), is not found significant.

[9] Due to statistically insignificant results, only one financial liberalization indicator (*kaopen*) is used in following estimations, whereas the main financial indicator is considered as *credit*.

Table 3: Estimation Results: *Interactive effects of credit and growth* (SGMM)

Model: $Gini_{i,t} = \alpha_i + \tau_t + \rho Gini_{i,t-1} + \beta_1 credit_{i,t} * growth_{i,t} + \beta_2 finopen_{i,t} + X_{i,t}{}' \gamma_n + \varepsilon_{i,t}$		
Variables	*Reg.1*	*Reg.2*
L.gini	0.950***	0.874***
	(0.042)	(0.052)
credit	**1.193****	**0.627*****
	(0.486)	(0.228)
credit*growth	**0.0004**	**0.005****
	(0.003)	(0.002)
kaopen	0.066	0.241**
	(0.106)	(0.122)
pcinc	-0.031*	
	(0.018)	
trade	0.472*	0.364
	(0.256)	(0.367)
govt	0.352	
	(0.375)	
hc	0.456	
	(0.471)	
inf	0.013*	0.084**
	(0.008)	(0.033)
indva	-1.629	
	(1.292)	
inst	-1.543***	-1.019
	(0.474)	(0.635)
tfp	1.354**	0.175
	(0.657)	(1.680)
labreg	0.099	
	(0.095)	
crisis	-0.172	
	(0.832)	
Observations	1036	1036
Wald Chi2-test	146920.27 [0.000]	160178.24 [0.000]
Hansen-J stat.	2.53 [0.639]	8.39 [0.136]
AB AR(1) test	-2.17 [0.030]	-1.42 [0.156]
AB AR(2) test	-1.43 [0.154]	-1.43 [0.154]
Instrumental variables	18	13

Notes: i. Robust standard errors are in round parentheses, p values are in square parentheses. **ii**. *** p<0.01,

** p<0.05, * p<0.1 **iii.** Lag limits validating instrumental variables are (1 2) in level and difference equations, respectively.

On the other hand, higher growth rate is associated with higher inequality. Therefore, the study refrains from having a precise opinion as in the case of some arguments that inequality decreasing role of financial development is realized through growth effect. In other words, implications that a rise in growth rate reduces inequality could not be supported by current estimation results.

For this reason, additionally, interaction term of domestic credits -as a financial indicator, coefficient of which is statistically significant and positive in almost all estimated models- with economic growth is also considered.[10] Hence, it is aimed to investigate the mediating role of growth in the impact of domestic credits on income inequality and in line with this purpose, results are displayed in Table 3. According to Table 3, interaction term expected to measure the role of economic growth in finance (credit) and inequality relationship is not significant for Reg.1. The result for Reg.2, where only significant variables in Reg.1 are included, reveals that growth does not create an inequality decreasing effect in finance-inequality link unlike Jalilian and Kirkpatrick (2005) and Dhrifi (2015).

Finally, based on the above estimations, possible nonlinearity in the models is also attempted to be explored by means of panel threshold regression analysis method developed to detect threshold effects in the relationship between the variables. Results for threshold regression estimation is displayed in Table 4. As is seen, income inequality increases with financial development significantly below and insignificantly above threshold level of growth. Threshold level corresponds to a growth rate of about 3.9 % between lower and upper limits of 3.898 and 3.915 meaning that below 3.9 % growth rate, financial development creates inequality (by 0.005) whilst this effect is not significant above 3.9% growth rate. Nevertheless, bootstrap probability value does not lead us to reject the null hypothesis that there is no threshold at 5% significance level. Therefore, there is no evidence to specify the model as nonlinear in respect to growth.

[10] In advance of this estimation, some other estimations by using *credit*high, credit*upper* and *credit*lower* interaction terms (*credit* variable is multiplied by dummy variables for high, upper-middle and lower-middle income groups, separately) were also conducted to test whether if development level of the countries in the sample are distinctive in finance-inequality relationship. However, results for each country group did not change much and no considerable variation in the coefficients was detected by income groups. Therefore, the results were not reported, and will be provided upon request.

Table 4: Panel Threshold Regression Estimation Results: *Nonlinear linkage*

Dependent variable: *Net Gini coefficient*		
Variables	**Threshold parameter (λ): *growth***	
credit	0.005** (0.003)	0.001 (0.003)
kaopen	0.357*** (0.073)	
pcinc	-0.051*** (0.007)	
growth	-	
inst	-0.340 (0.392)	
trade	0.245 (0.347)	
govt	-0.979* (0.555)	
hc	-1.512*** (0.578)	
inf	-0.013** (0.006)	
indva	-0.404 (0.644)	
tfp	-2.061** (0.830)	
labreg	0.558*** (0.073)	
crisis	-0.328** (0.155)	
Observations	960	
F test	187.12 [0.000]	
Threshold level	**3.903** [3.898-3.915]	
F statistics (threshold effect)	6.63	
Bootstrap p (probability) value	**[0.460]**	

Notes: i. Robust standard errors are in round parentheses, probability (p) values of test statistics are in square parentheses.
ii. *** p<0.01, ** p<0.05, * p<0.1 **iii.** Replication numbers for bootstrap method to estimate probability value is 500, and trim percentage is 5%.

In a nutshell, as opposed to particularly neoclassical arguments, some evidence is obtained that a rise in the supply of credit to the private sector consisting of households and firms does not improve income distribution. Growth as an outcome of financial development in mainstream approach, on the other side, is not inequality alleviator; contrarily, may have a role in rising inequality in case not distributed fairly among different income segments in the economy.

7. Conclusions

Neoliberal economic policies of 1980s have been implemented almost in all the world economies which simultaneously have coincided with an unfair distribution of income. Neoclassical arguments ignoring the role of financial expansion in their analyses have attributed the increase in income inequality since 1980s, generally to the labor supply and demand mechanisms associated with trade liberalization and technological developments, and hence skill gap among labor force. Current study specifically considers the role of finance in rising income inequality and the links between finance, growth and income distribution by employing GMM and threshold regression models for 1996-2016 period in a large sample of developed and developing countries.

Estimates from the analysis significantly disclose a finding that financial development measured by domestic credits to households and firms does not have a favorable effect on income distribution. Considering this finding, financial gains of the credit providers, due to the increased credit expansion and thus debt and interest payment obligations of borrowed low income groups and small-sized companies, may distort income distribution against poor segments of population. Results also provide a clue that growth is not pro-poor, as opposed to the views regarding growth as pro-poor. Results show that growth does not moderate the relationship between finance and income distribution, rather results might be interpreted as of even if economic growth increases, it benefits certain groups with highest income shares. Therefore, these results are crucial as they provide important clues that GDP growth may not be a good indicator of economic performance and may not be associated with lower inequality. What the source of growth is the issue that needs to be discussed at this point. Thereby, addressing demand-side determinants of growth as much as supply-side determinants like financial development is also essential.

It is surely beyond doubt that it does not seem possible to resolve the inequality problem at the core of the financially capitalist system with a few policy recommendations. However, within the framework of the findings and implications described above; some policy recommendations could be made to reduce the income disparities that are clearly caused by the neoliberal financial structure. The concept of social state in the financialized world is far distant from lower-income segments of populations who are dependent on the financial system in fulfilling their basic needs. As a result of neoliberal policies, from the point of households, increasing flexibility in labor markets, loss of workers bargaining power and hence wage repression which forces them to demand credits may lead adverse outcomes in terms of distribution. For small firms in a tough global competition environment, catching up with other firms is getting harder. In this sense, growth in line with mar-

ket-oriented policies like enhancing the financial activities rather than redistributive policies hurts the poor by worsening distribution of income. In a broader sense, since institutional quality is an inequality alleviator according to the findings, growth in financial sector and in turn financial development should not be encouraged in a capitalist environment with the lack of institutional reforms in terms of corruption and rent-seeking activities.

It is quite apparent that a prosperous financial sector slants the economic landscape in favor of capital owners rather than labor, which creates an advantage for financial sector to dominate the real sector. Some findings point out that an increase in industry value-added decreases inequality, and which shows that the dynamics reducing inequality are effective in this sector. Therefore, fiscal or monetary policy instruments that might reduce the relative size of the low-value-added financial sector in the economy by providing incentives to high-value-added investments in industrial sector should be promoted coordinately. Moreover, although the impact of tax rates could not be investigated in the analysis, taxation should be fair and tax rates should be proportionate to the incomes and wealth of the social classes for tackling within-country inequalities. Shifting the tax burden from the taxes that distort the distribution, such as the high taxation of the labor, to the tax items with a potential effect on improving the income distribution, such as luxury consumption, property and financial wealth tax, is a necessity. In this context, resorting to policies that consider income distribution as the primary goal is of great importance. No doubt that the subject deserves a further investigation.

Appendix A

Table A1: Variable definitions

Dependent variable	Definition	Unit of variable	Source
Gini	Inequality in income distribution	Index (0 - 100)	SWIID 8.1
Main independent variables			
credit	Domestic credits to private sector	Share in GDP (%)	WB-WDI
kaopen	Capital account openness index	Index (-1.91 | 2.36)	Chinn and Ito (2008); AREAER
fdi	Inward foreign direct investment stocks	Share in GDP (%)	UNCTAD
Control variables			
growth	GDP growth	Percentage of GDP	WB-WDI
pcinc	Income per capita	2010 constant prices	WB-WDI
trade	Sum of exports and imports	Share in GDP (%)	WB-WDI
govt	Government expenditures	Share in GDP (%)	WB-WDI
hc	Human capital index	Index (1.4 | 3.7)	PWT
inf	Inflation rate	% change in CPI	WB-WDI
inst	Institutional quality	Index (-2.5 | 2.5)	WB-WGI
indva	Industry value-added	Share in GDP (%)	WB-WDI
tfp	Total factor productivity	Index (US=1)	PWT
labreg	Labor market deregulations	Index (0 - 10)	EFD
crisis	Global financial crisis	Dummy variable	-
legalsys	Legal system and property rights	Index (0 - 10)	EFD

Notes: AREAER: Annual Report on Exchange Arrangements and Exchange Restrictions
EFD: Fraser Institute Economic Freedom Database
PWT: Penn World Table
SWIID: Standardized World Income Inequality Database
WB-WDI: World Bank World Development Indicators
WB-WGI: World Bank World Governance Indicators

Table A2: List of Countries

1	Argentina	27	Israel
2	Austria	28	Italy
3	Australia	29	Japan
4	Belgium	30	Malaysia
5	Bolivia	31	Mexico
6	Brazil	32	Netherlands
7	Bulgaria	33	Norway
8	Chile	34	Panama
9	China	35	Paraguay
10	Colombia	36	Peru
11	Costa Rica	37	Phillippines
12	Croatia	38	Poland
13	Cyprus	39	Portugal
14	Czech Republic	40	Romania
15	Denmark	41	Russian Federation
16	Dominican Republic	42	Singapore
17	Ecuador	43	South Korea
18	Egypt	44	Spain
19	Finland	45	Sweden
20	France	46	Switzerland
21	Germany	47	Thailand
22	Greece	48	Turkey
23	Honduras	49	Ukraine
24	Hungary	50	United Kingdom
25	Iran	51	United States
26	Ireland	52	Uruguay

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