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The Effects of Financial Development, Democracy and Human Capital on Income Distribution in Developing Countries: Does Financial Kuznets Curve Exists?

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Abstract

Although there are many empirical studies examining the effects of financial development on economic growth performance of countries, the effects of the increased national income as a result of financial development on the low-income segments of society and income distribution is mostly ignored. In addition, it is also well-known fact that there are contradictory arguments about the impact of financial development on income distribution. To this end, this study aims to examine the validity of the financial Kuznets hypothesis for the period of 1990-2013 for 23 developing countries. In this direction, it is aimed to examine the effects of economic growth, democracy, human capital and financial development on income inequality. For this purpose, panel unit root, panel cointegration, panel FMOLS long-run coefficient estimator and panel causality tests are used to examine the relationship between mentioned variables. As a result of the empirical analyses, it was observed that when the findings are evaluated on the basis of the panel, increasing national income, democracy level and human capital accumulation reduces income inequality. Furthermore, it was determined that there is U-shaped relationship between financial development and income inequality, and therefore the existence of financial Kuznets hypothesis was not confirmed.

Keywords: Financial Kuznets Hypothesis, Financial Development, Income Inequality, Democracy, Human Capital, Panel Data Analysis, FMOLS

JEL Codes: D31, C33, G20, O11, O15

1. Introduction

Financialization process of global economies as the next stage after international integration has considerably increased the dependence of national economies to the financial system and developments in the financial system have significantly contributed to the national economic performances of the countries. As the next stage of the international integration process, the financialization process of the global economies has significantly increased the defence of the economies of the financial system to the financial system and the developments in the financial system have made significant contributions to the economic growth performance of the countries. On the other hand, it is another indicator of how national economies are dependent on the financial system that they have encountered the crises arising from

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disruptions of the national global financial systems of countries in the period when the financialization process is not under control unchecked or it is miscontrolled. As a matter of course As a natural consequence of these situations, the central banks, duty task of which is assuring price stability, have thus undertaken has evolved a second duty task on maintaining the financial stability.

It is known that financial investment opportunities necessary for economic development in developing countries which have limited capital accumulations are substantially dependent on direct foreign investments and the funds obtained from the financial system. Accordingly, some developing countries have carried out several reforms in order to have a developed and durable financial system. Although the opinion which says that financial development contributes to economic growth by increasing physical and human capital accumulations and by raising funds for the technological innovation activities has been frequently analysed; it is generally ignored which segment of society benefiting from the national income increasing as a result of the financial development and which extent they can benefit from it, in other words, how it affects the income distribution in national economy. As a matter of fact, the state where the low-income segments of society benefit from the financial enrichment as or more than the high-income segments of society is named "inclusive growth" in the financial literature and enabling the economic growth to be an inclusive growth is one on the primary objectives and duties of the policy-makers.

It is also known that there are different opinions on the effects of financial development on income distribution. The opinion which says that financial development increases national income by stimulating market capitalization, and thus, the increased national income affects income distribution positively by increasing the income levels of the low-income segments of society has come into prominence as an indirect effect of financial development on income distribution. The opinion which says that enabling loan access for the low-income segments of society as a result of financial development makes them to have their own employment opportunities, and thus, it affects income distribution positively also accepted as the direct effect of financial development on income distribution. Nevertheless, there are some opinions which say that financial development only contributes to the income levels of the high-income segments of society, thus the income distribution equity is disrupted in national economies of the countries which are weak in institutional and democratic sense even if they have a strong financial system. Besides, there are some opinions which claim that in case the funds obtained from the financial system are not directed to the investments increasing the human capital accumulation of the countries it can affect the income distribution adversely. The "financial Kuznets hypothesis" (Greenwood Jovanovich Hypothesis) which has been frequently analysed in recent years within the relevant literature claims that due to high information asymmetry and high costs of access to resources within the beginning stage of financial development, the income distribution equity is disrupted; after the financial system is developed and the access of the low-income segments of society to the resources is enabled, the income distribution equity is then affected positively. In sum, the last claim reflects the opinion which says that there is an inverted-U relationship between financial development and income inequality.

When the hypotheses developed in order to explain the relationship between financial development and income distribution are analysed, it can be observed that it is not possible to evaluate the effects of financial development on income distribution independently from democracy levels of countries and human capital accumulation. There are also some opinions which claim that in addition to the indirect effects of democracy level on income distribution in terms of accomplishing the policies to be implemented in order to decrease income inequality; there are some direct effects of it on income distribution such as distributing the increase on the national income to the specific segments which has political power more and decreasing their rent seeking. Similarly, human capital accumulation also attracts the policy-

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makers' attention as a frequently applied political instrument in order to enable the low-income segments of society to be employed with high salaries.

Although there are many empirical studies examining the effects of financial development on economic growth performance of countries, the effects of the increased national income as a result of financial development on the low-income segments of society and income distribution is mostly ignored. To this end, the aim of this study is to analyse the validity of the financial Kuznets hypothesis, which is a current matter in question within the financial literature, on the annual data from 23 developing countries for the period of 1990-2013. Accordingly, in order to analyse the effects of national income, democracy level and human capital accumulation in addition to financial development on income inequality, the abovementioned variables are included by the empirical model as independent variables. In the first stage of the study, stationarity of the series was tested by the panel unit root tests for all variables, then the validity of long-term relationships between the variables was analysed through the panel cointegration tests. In order to determine the effects of financial development, national income, democracy level and human capital accumulation on income inequality; and to identify those effects both for panel and for all countries separately; the panel cointegration estimator was used. Finally, causality relationships between the variables were analysed through the panel causality test. By adopting the opinion which says that evaluating the effects of financial development on income distribution independently from democracy levels of a country and human capital accumulation is not possible, the financial Kuznets hypothesis was examined by considering the variables national income, human capital and democracy level in this study. To the best of our knowledge, it is the first research analysing the effects of financial development, democracy and human capital on income distribution for 23 developing economies via panel cointegration, panel FMOLS long-run estimator and panel causality tests.

The remaining sections of the study were organized as follows: in the second section, the literature was reviewed by analysing the empirical studies investigating the relationships between the variables included by the model and income distribution; in the third section, the datasets used within the study and the acquiring process of the data were detailed, and the methodology used for the empirical analyses and the model specification were introduced; in the final section, the results of the empirical analyses were presented and policy suggestions were made based on the results for developing economies.

2. Literature Review

Although there are lots of arguments on the factors determining income distribution, the studies in which the relevant factors have been empirically analysed are very few. The summary of the empirical literature in which the effects of the relevant factors on income distribution and was analysed in this study is presented in the Table 1. When the studies analysing the effects of human capital on income distribution were evaluated, it was observed that education level and educational expenditures had been used as the indicators of human capital and different results had been obtained for different horizontal segments. Gregorio and Lee (2002) investigated the relationship between human capital accumulation and income distribution for 49 countries through the Panel SUR Method and by discussing the period of 1960-1990; and they determined that the increase on human capital accumulation decreases income inequality at the end of their study. Similarly, Muller (2002) investigated the relationship between human capital and income inequality for 50 states of the U.S.A. for the period of 1989-1990 by using the horizontal segment analysis and determined that human capital decreases income inequality at the end of the study.

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Table 1: Research Background

Author(s)	Data	Methodologies	Results
Studies examining the relationship between human capital and income distribution			
Gregorio and Lee (2002)	49 countries 1960-1990	SUR regression model	The increase on human capital decreases income inequality.
Muller (2002)	50 states of the U.S.A. 1989-1990	Cross-sectional analysis	The increase on human capital decreases income inequality.
Rodriquez-Pose and Tselios (2009)	EU member states 1995-2000	GMM method	The increase on human capital increases income inequality.
Keller (2010)	Developed countries 1970-2000	Panel regression method	The increase on human capital decreases income inequality.
Bergh and Nilsson (2010)	79 countries 1970-2005	GMM method	The increase on the human capital increases the income inequality.
Apergis et al. (2014)	States of the U.S.A. 1981-2004	Panel VECM method	The increase on educational level increases income inequality.
Mahmood and Noor (2014)	55 countries 1970-2010	GMM method	The increase on human capital increases income inequality.
Studies examining the relationship between democracy and income distribution			
Carter (2007)	123 countries 1970-2000	Panel regression method	The increase on democracy level increases income inequality.
Apergis et al. (2014)	States of the U.S.A. 1981-2004	Panel VECM method	The increase on democracy level decreases income inequality.
Nikoloski (2015)	11 countries 1962-2006	GMM method	Democracy level has no statistically significant effect on income inequality.
Amir-Ud-Din and Khan (2017)	Pakistan 1963-2016	3SLS estimator method	The increase on democracy level decreases income inequality.
Studies examining the relationship between financial development and income distribution			
Jalil and Feridun (2011)	China 1978-2006	ARDL bound test	The financial development decreases income inequality.
Shahbaz and Islam (2011)	Pakistan 1965-2011	ARDL bound test	The relationship between financial development and income distribution is a long-term relationship, and it was determined that financial development decreases income inequality.
Arora (2012)	India 2000-2007 monthly data	Panel data regression analysis	According to the results of the analyses carried out separately for the rural and urban areas, financial development decreases income inequality only for the urban areas.
Nikoloski (2013)	Developed and developing countries 1962-2006	Dynamic panel data analysis	There is an inverted-U curve relationship between financial sector development and income inequality.
Jaumotte et al. (2013)	31 developing and emerging countries 1981-2003	Fixed effects panel data	They found that an increase of income inequality was associated with an increase of financial globalization
Bahmani and Zhang (2015)	17 countries 1963-2002	ARDL bound test	The short-term effects of financial market development on income distribution are balanced in 10 countries; the mentioned effects are long-term effects only for the Denmark, Kenya and Turkey.
Shahbaz et al. (2015)	Iran 1965-2011	ARDL bound test, Granger causality test and VECM	There is an inverted-U curve relationship between financial sector development and income inequality.
Gunaydin and Cetin (2015)	Turkey 1970-2006	Johansen-Juselius co-integration test, Granger causality test	There is a long-term balance between the variables of economic growth, commercial openness and income inequality; and the financial Kuznets curve is applicable.
Satti et al. (2015)	Kazakhstan 1991-2011	ARDL bound test	The GJ hypothesis was verified and it was determined that there is a U-shaped relationship between financial development and income inequality.

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Table 1: Research Background (cont)

Author(s)	Data	Methodologies	Results
Jauch and Watzka (2016)	138 developed and developing countries 1960-2008	Dynamic panel data analysis	The financial development increases income inequality.
Baiardi and Morana (2016)	EURO zone 1985-2013	Haussman test, Hanjen-J statistic Kleibergen-Paap	It was found out that the financial Kuznets curve is applicable for the Euro Zone; within the financial crisis periods, when there is a disruption on income inequality for all of the countries in the Euro Zone.
Seven and Coskun (2016)	45 emerging countries 1987-2011	GMM methods	The financial development increases income inequality.
Akan et al. (2017)	EU member countries 1992-2013	Panel long-run estimator	Their study reveals that U-shaped financial Kuznets curve hypothesis is valid for those countries.
Buhaerah (2017)	ASEAN-5 countries 1990-2013	Panel data analysis	Financialization indicators contribute positively to worsen income inequality.
Destek et al. (2017)	Turkey 1977-2013	ARDL bound test and VECM	Their study reveals that the inverse U-shaped financial Kuznets curve hypothesis is valid for Turkey.
Azam and Raza (2018)	ASEAN-5 countries 1989-2013	Panel data analysis, Pedroni panel cointegration test, Kao residual panel cointegration test	Financial development has a positive impact on income inequality and the paper confirms the presence of financial Kuznets hypothesis in those countries.
Rachmawati et al. (2018)	Indonesia 2000-2016	VECM	Financial deepening significantly affects income inequality in Indonesia.
Malarvizhi et al. (2019)	ASEAN-5 countries 1980-2011	The LM, Hausman tests and OLS method	Financial development has a significant positive effect on economic growth.

Source: Authors.

Similar with the other two studies, Keller (2010) and Apergis et al. (2014) investigated the relationship between human capital and income inequality for developed countries and states of the U.S.A. respectively; and they determined as a result of their empirical analyses that human capital decreases income inequality. On the contrary, Rodriguez-Pose and Tselios (2009) investigated the mentioned relationship for the member countries of the U.N. and for the period of 1995-2000 through the Panel GMM Method and found out that the increase on human capital levels of the countries of the U.N. has a disrupting effect on income distribution. Additionally, Bergh and Nilsson (2010) and Mahmood and Noor (2014) determined as a result of their investigations which they used the Panel GMM Method for 79 countries and 55 countries respectively that human capital increases income inequality. In sum, when the empirical literature investigating the relationship between human capital and income distribution is analysed, it is observed that there is no generally accepted opinion similar with the theoretical opinions and the results differ based on the investigated countries or country groups.

In the studies investigating the relationship between democracy level and income distribution, it is observed that economic or political freedom indexes were used generally, and different results were obtained. For instance, Carter (2007) determined as a result of the study which the Panel Regression Method was used for 123 countries and the period of 1970-2000 that the increase on the democracy level increases income inequality. On the contrary, Apergis et al. (2014) determined as a result of their study which they investigated the effects of the increases on democracy level on income distribution in states of the U.S.A. and for the period of 1981-2004 through the Panel VECM Method that the increase on democracy level decreases income inequality. Similarly, Amir-Ud-Din and Khan (2017) investigated the relationship between the mentioned variables for Pakistan and for the period of 1963-2016

through the 3SLS Estimator, and they determined that the increase on democracy level decreases income inequality as a result of their study. Nikoloski (2015) investigated the effects of democracy on income distribution for 11 countries and for the period of 1962-2006 through the Panel GMM Method and determined that democracy level does not have a significant effect on income distribution.

When the literature investigating the relationship between financial development and income inequality was evaluated in accordance with the main aim of the study; the results of the following studies were taken into consideration. Beck et al. (2007) determined as a result of the study which they used the data of 72 developing countries in the period of 1960-2005, and the data of 68 developing countries in the period of 1980-2005 in order to evaluate the effects of financial system development on incomes of poor people and income distribution that financial development helps to increase the incomes of the poorest segments. The results of their study indicated that 60% of the enhancement on the incomes of poor people is resulted from the growth as a result of financial development, and the remaining 40% is resulted from the direct effect of financial development on the incomes of poor people. Shahbaz and Islam (2011) investigated the relationship between financial development and income distribution in Pakistan for the period of 1965-2011. Their results revealed that the relationship between financial development and income distribution is a long-term relationship, and it was determined that financial development decreases income inequality. Jalil and Feridun (2011) investigated the relationship between financial development and income distribution in China for the period of 1965-2011 through the ARDL Bound Testing Approach and determined empirical results which say that financial development decreases income inequality.

In order to evaluate the relationship between financial development and income distribution in terms of the income distributions of the rural and urban areas separately, Arora (2012) investigated the observation period of 2000-2007 through the Panel Regression Method and determined as a result of the study that financial development only decreases income inequality in urban areas. Jaumotte et al. (2013) examined the relationship between financial development and income distribution in China for the period of 1965-2011 through the fixed effect panel data in 20 advanced countries as well as 31 developing and emerging countries for the research period from 1981 to 2003. They stated that an increase of income inequality was associated with an increase of financial globalization. In the study of Nikoloski (2013) which the mentioned variables were investigated for developed and developing countries and for the period of 1962-2006 through the Dynamic Panel Data Analysis. Nikoloski (2013) determined that there is an inverted-U relationship between financial development and income inequality, thus the financial Kuznets hypothesis, in other words Greenwood-Jovanovich (GJ) Hypothesis is valid. As a result of the investigation carried out by Shahbaz et al. (2015) on the relationship between financial development and income distribution for Iran and for the period of 1965-2011 through the ARDL Bound Testing Approach, they determined that there is an inverted-U relationship between financial development and income inequality, and therefore the financial Kuznets curve was determined to be valid. Bahmani and Zhang (2015) explored the relationship between financial development and economic growth in 17 countries for the period of 1963-2002. The results suggested that the short-term effects of financial market development on income distribution are balanced in 10 countries; the mentioned effects are long-term effects only for the Denmark, Kenya and Turkey. Baiardi and Morana (2016) investigated the relevant relationship for the countries of the Euro Zone and based on the observation period of 1985-2013 and determined as a result of their study that the financial Kuznets curve hypothesis is valid. Similarly, Gunaydin and Cetin (2015) investigated the relationship between financial development and income inequality for Turkey based on the period of 1970-2006 through the Johansen Cointegration Test and determined as a result of the study that the results verifying the financial Kuznets curve hypothesis are valid.

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On the contrary to these studies, Satti et al. (2015) investigated the relevant relationship for the period of 1991-2011 and for the economy of Kazakhstan through the ARDL Bound Testing Approach and indicated as a result of the study that a U-shaped relationship is valid between financial development and income inequality, and thus the financial Kuznets curve hypothesis is note valid. Jauch and Watzka (2016) investigated the relationship between financial development and income inequality for the panel dataset consisting of 138 developed and developing countries by considering the period of 1960-2008 and determined that financial development increases income inequality. Seven and Coskun (2016) investigated the relationship between financial development and income distribution in 45 emerging countries over the period 1987-2011. GMM method indicated that a statistically significant contribution of bank development on the growth effect of income inequality. Akan et al. (2017) investigated the presence of financial Kuznets curve hypothesis for the panel dataset consisting of 20 member countries of European Union for the period of 1992-2013. The panel long-run estimator results indicated that economic development leads to increase in income inequality. Furthermore, the results revealed that inverted U-shaped financial Kuznets curve hypothesis is valid in EU member countries. Destek et al. (2017) investigated the relationship between financial development and income distribution in Turkey for the period of 1977-2013. The study results suggested that the inverse U-shaped financial Kuznets curve hypothesis is supported in Turkey. Buhaerah (2017) explored the relationship between financialization measurements and income inequality in the ASEAN 5 countries for the period of 1990-2013. The study results showed that financialization indicators contribute positively to worsen the income inequality. Azam and Raza (2018) examined the relationship between financial sector development and income inequality for the panel dataset including the ASEAN 5 countries by considering the period of 1989-2003 and revealed that financial development has a positive and significant impact on income inequality. They confirmed the existence of financial Kuznets hypothesis in those countries. Rachmawati et al. (2018) examined the relationship between financial development and income inequality in Indonesia for the period of 2000-2016. They determined that financial deepening affects income inequality in Indonesia. Malarvizhi et al. (2019) explored the relationship between financial development and economic growth in ASEAN- 5 countries for the period of 1980-2011. Their analyses revealed that financial development has a significant positive effect on economic growth in ASEAN-5 countries.

When the literature was analysed it was observed that the results generally indicate the decreasing effects of financial development on income inequality, the inverted-U relationship between financial development and income distribution and correspondingly, the validity of the financial Kuznets curve hypothesis.

3. Model, Data and Methodology

In this section, the empirical model established for the empirical analyses in order to test the validity of the financial Kuznets hypothesis for developing economies was introduced; and the variables included by the empirical model and the databases which the mentioned variables were obtained from were detailed. The econometric methods to be used for the empirical analyses were also introduced here.

When the studies investigating the effects of financial development on income inequality are analysed, it is known that the major factors affecting income inequality are real national income and financial development; and it is observed that some control variables have been included as independent variables by the model in addition to the mentioned variables. In this study; income inequality, real national income, financial development, democracy level of a country and human capital accumulation was assumed to have functions;

$$GINI = f\left(GDP, FD, DEM, HC\right) \quad (1)$$

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in the above function; by representing income inequality, the variable GINI indicates the coefficient Gini; by representing national income level, the variable GDP indicates per capita reel gross domestic product (GDP); by representing financial development, the variable indicates the share of domestic loans provided for private sector on national income; representing democracy level of a country, the variable DEM indicates democracy index; and representing human capital accumulation, the variable HC indicates human capital index. The panel version of the logarithmic equation created in order not to ignore the potential non-linear relationship between financial development and income inequality in accordance with the literature. To examine the relationship between income inequality, real national income, financial development, democracy level of a country and human capital accumulation, we consider the baseline model as follows:

$$\ln GINI_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln FD_{it} + \beta_3 \ln FD_{it}^2 + \beta_4 \ln DEM_{it} + \beta_5 \ln HC_{it} + \mu_{it} \qquad (2)$$

where, by representing income inequality, the variable *lnGINI* indicates natural logarithm of the coefficient Gini (the higher coefficient Gini indicates the less equal society); by representing economic growth, *lnGDP* indicates natural logarithm of per capita reel GDP; by representing financial development, *lnFD* (*lnFD*^{2}) indicates natural logarithm (the square) of the share of domestic loans provided for private sector on national income; *lnDEM* indicates natural logarithm of democracy index (the increase on democracy index indicates low democracy level); *lnHC* indicates natural logarithm of human capital index. Besides; *i*, *t* and μ_{it} indicate horizontal segment (countries), the time period and residual term, respectively. Positive coefficient β_2 and negative β_3 obtained from regression are viewed as a support of the validness of Kuznets hypothesis. From fitting we obtained a negative value of β_3 and a positive value of β_2 coefficient which is in accordance with the inverted U-curve hypothesis (Melikhova and Cizek, 2014: 396). In other words, inequality reducing hypothesis is approved in the case of $\beta_2<0$ and $\beta_3=0$; inequality increasing hypothesis is approved if $\beta_2 > 0$ and $\beta_3=0$.

GDP series was used in dollar with the fixed prices of 2010 and *FD* and *FD*^{2} series were used in the share on national income; and they were acquired from the WDI database created by the World Bank. The *GINI* data was acquired from the SWIID 5.1 database created by Solt (2016); *DEM* data was acquired from the Freedom House database; *HC* data was acquired from the PWT 9.0 database.

In the study, the economies of 23 countries were investigated based on developing economies classification by IMF through the annual series of the period of 1990-2013. Those countries are Argentina, Bangladesh, Brazil, Bulgaria, Chile, China, Columbia, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine and Venezuela.

Primarily the panel unit root tests were used in the study in order to test the integration degrees of the variables included by the model to test the validity of the financial Kuznets hypothesis for developing economies. The stationarity of the series was analysed through the unit root tests developed by Levin et al. (2002) and Im et al. (2003). The validity of the long-term relationships between the variables was analysed through the cointegration tests developed by Pedroni (1999) and Kao (1999). Then, the effects of economic growth, democracy index and human capital accumulation on income distribution were analysed through the FMOLS coefficient estimator. Besides, the causality relationships between the variables were analysed through on a popular panel version the Panel Causality Test developed by Dumtirescu and Hurlin (2012).

Levin et al. (2002) claimed that the unit root tests to be performed for each horizontal segment have a limited power in terms of alternative hypothesis and the obtained results will contain significant deviations from the balance. For the mentioned problem, especially possible to be encountered for the minor samples, Levin et al. (2002) suggested the LLC

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(Levin-Lin-Chu) unit root test which is more powerful test for all of the horizontal segments. The general equation of the test where the alternative hypothesis which says the series are stationary for each segment is tested against the null hypothesis which says each time series contain unit roots is as follows:

$$\Delta y_{it} = \tau y_{it-1} + \sum_{L=1}^{P_i} \theta_{iL} \Delta y_{it-L} + \alpha_{mi} d_{mt} \varepsilon_{it}, \quad m = 1,2,3 \tag{3}$$

in the equation (3), d_{mt} represents deterministic variable and α_{mi} represents coefficient vector. Since the P_i value in the equation is unknown, the test is calculated in three steps: in the first step, the Augmented Dickey Fuller regression is performed for each series in the panel separately; in the second step, the long- and short-term standard error rates for each series are estimated; and in the third step, the pooled *t*-statistic is calculated (Baltagi, 2005: 240).

In the first step, the basic equation is performed for each horizontal segment and the lag length (P_i) is allowed to be differentiated between the horizontal segments. For the *T* period, the maximum lag length (p_{max}) is selected; if a smaller lag length is selected preferably, the t-statistic of the θ_{iL} is used. The mentioned t-statistic has a standard normal distribution based on the null hypothesis. After determining P_i; the residuals e_{it} and v_{it-1} are obtained by performing the regressions Δy_{it} and y_{it-1} on the suitable deterministic variables Δy_{it-L} and d_{mt}. The normalization is ensured through the following calculation:

$$e_{it} = \frac{e_{it}}{\sigma_{\varepsilon i}}, \qquad v_{it-1} = \frac{v_{it-1}}{\sigma_{\varepsilon i}} \tag{4}$$

in those residuals. In the second step, long- and short-term standard error rate is calculated. Based on the null hypothesis which accepts that there is a unit root, the long-term variance of the model is obtained with the calculation below (Levin et al., 2002: 5-6):

$$\sigma_{yi}^2 = \frac{1}{T-1} \sum_{t=2}^{T} \Delta y_{it}^2 + 2 \sum_{L=1}^{K} w_{KL} \left[\frac{1}{T-1} \sum_{t=2+L}^{T} \Delta y_{it} \Delta y_{it-L} \right] \tag{5}$$

in the equation (5), *K* represents the transition lag, and *L* represents the normal lag. The *K* value should be found in a way which does not affect the variance consistency. In order to obtain the average standard error, the formula $S_N = \frac{1}{N} \sum_{i=1}^{N} s_i$ is used. In the last step; the panel test statistics are calculated by using the regression generated with the observation number NT;

$$e_{it} = p v_{i,t-1} + \varepsilon_{it} \tag{6}$$

in the equation, *t* represents the average number of the observations; *p* represents the individual Augmented Dickey Fuller (ADF) average lag length (Cetin and Ecevit, 2010: 175).

LLC test is a restricted test since the testing the stationarity of the series can only be performed on the homogenous horizontal segments. Therefore, Im et al. (2003) developed the IPS (Im-Pesaran-Shin) unit root test which is a unit root test allowing the heterogeneousness of the horizontal segments and is also obtained by the average of the individual unit root test statistics (Baltagi, 2005: 242). The IPS test is based on the following regression equation (Baltagi, 2011; Im et al., 2003):

$$\Delta y_{it} = \mu_i + \beta_i y_{i,t-1} + \sum_{k=1}^{p_i} \theta_{i,k} \Delta y_{i,t-k} + \gamma_i t + \varepsilon_{it} \tag{7}$$

The above equation contains constants and trends. Therefore, in order to obtain the equation with constant, it is necessary to remove the trend from the equation. According to the

IPS test, rejecting the null hypothesis means that one or more than one series are stationary. This test allows for residual serial correlation and heterogeneity of the dynamics and error variances across groups.

Im et al. (2003) calculated the *t*-statistic for each horizontal segment as $t_i = \beta_i/sh(\beta_i)$. Then, they calculated the mean *Z* statistic of t_i using the following formula;

$$Z = \left(\frac{\sqrt{N}\left(t - E(t)\right)}{\mathrm{var}(t)} \right) \square\ N(0,1) \qquad (8)$$

The *t* value in this formula is obtained through the formula $t = \frac{1}{N}\left(\sum_{i=1}^{N} t_i\right)$ (Cetin and Ecevit, 2010: 174).

One of the panel-cointegration tests which are used most frequently in the literature was developed by Pedroni (1999). This test allows the heterogeneousness of the cointegration vectors. The test also allows both the differences of the dynamic and fixed effects between the segments of the panel, and the differences of the cointegrated vector between the segments under the alternative hypothesis (Guvenek and Alptekin, 2010: 181).

Pedroni suggested 7 different tests for the null hypothesis which says that a cointegrated relationship does not exist between the variables. Four of the mentioned tests are the panel cointegration statistics and the remaining three are the cointegration statistics of the ensemble average.The first test of the first category where there are four tests in total is a nonparametric statistic such as variance ratio. The second one is the nonparametric statistic resembling to the form of the Phillips-Perron (PP) statistic adapted to the panel. The third statistic is again nonparametric resembling to the PP-t statistic. The last statistic in the first category is parametric and a statistic resembling to the Augmented Dickey Fuller (ADF)-t statistic.

The first one of three statistics in the second category resembles to the PP-rho statistic, the second one resembles to the PP-t statistic and the third one resembles to the ADF-t statistic. The comparisons for the determination of the more advantageous statistic are based on the collection process of the data. Pedroni studied the sampling characteristics of seven statistics through the Monte Carlo simulation; and indicated that in case the time dimension is low, the panel ADF-t and the group ADF-t statistic produce good results (Kok and Simsek, 2006: 7). Therefore, in this study the panel ADF and the group ADF statistics based on the ADF of the cointegration test developed by Pedroni (1999) were taken into consideration.

Pedroni (1999) primarily performed the following general regression pattern of the panel cointegration;

$$y_{i,t} = \alpha_i + \delta_i t + \beta_{1i} x_{1i,t} + \beta_{2i} x_{2i,t} + ... + \beta_{Mi} x_{Mi,t} + \varepsilon_{i,t} \qquad (9)$$

In the regression; *t* indicates the panel time dimension, *i* indicates the horizontal segment dimension, and *M* indicates the number of variables. Pedroni followed four steps in order to calculate the statistics.

In the first step, Pedroni estimated the general regression of the panel cointegration; and author calculated the residuals in order to use them later after being sure about that the common dummy variables, time trend and constant required to be included by the regression were included by the regression. In the second step, the differences of the original series were taken for each segment and the residuals were calculated for each differentiated regression through $\Delta y_{i,t} = \beta_{1i}\Delta x_{1i,t} + \beta_{2i}\Delta x_{2i,t} + ... + \beta_{Mi}\Delta x_{Mi,t} + n_{i,t}$. In the third step, author calculated the $L^2{}_{11i}$ which is the long-term variance of the $n_{i,t}$ in the previous step by using the one of the kernel estimator such as Newey-West (1987) estimator. In the fourth step author used the residuals

of the original regression obtained in the first step for the parametric and nonparametric statistics in two different ways. For the nonparametric statistics, $e_{i,t} = \gamma_i e_{i,t-1} + u_{i,t}$ is estimated; and the long-term variance of the u_i was calculated by using the obtained residuals.

Author calculated the formula $\lambda_i = \frac{1}{2}\left(\sigma_i^2 - s_i^2\right)$ by symbolising the obtained variance with σ_i^2. In the formula, s_i^2 indicates the simple variance of $u_{i,t}$. For the parametric statistics the simple variance of the $u_{i,t}$ was calculated by using the formula $e_{i,t} = \gamma_i e_{i,t-1} + \sum_{k=1}^{K_i} \gamma_{i,t-k} + u_{i,t}$ and the residuals. The calculation of the panel ADF and group ADF used for our study is as follows (Pedroni, 1999: 7-9; Asteriou and Hall, 2007: 374-376):

The panel t-statistic (parametric):

$$Z_{t_{N,T}}^{*} = \left(s_{N,T}^{*2} \sum_{i=1}^{N} \sum_{t=1}^{T} L_{11i}^{-2} e_{i,t-1}^{*2}\right) \sum_{i=1}^{N} \sum_{t=1}^{T} L_{11i}^{-2} e_{i,t-1}^{-2} \left(e^{*}_{\ i,t-1} \Delta e^{*}_{\ i,t}\right) \tag{10}$$

The group t-statistic (parametric):

$$N^{-1/2} Z^{*}_{\ t_{N,T}} = N^{-1/2} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} s_i^{*2} e_{i,t-1}^{*2}\right)^{-1/2} \sum_{t=1}^{T} e_{i,t-1}^{*} \Delta e_{i,t}^{*} \tag{11}$$

The regression estimated in the Pedroni test, is as follows in sum:

$$e_{i,t} = \gamma_{i,t-1} + \sum_{k=1}^{K} \gamma_{i,k} \Delta e_{i,t-k} + u_{i,t}^{*} \tag{12}$$

Kao (1999) developed a cointegration test based on the Augmented Dickey Fuller (ADF) and Dickey Fuller (DF) tests (Baltagi, 2005: 252; Asteriou and Hall, 2007: 372). The Kao cointegration test was formed basically performing the following regression:

$$e_{i,t} = p e_{it-1} + \sum_{j=1}^{p} \varphi_j e_{it-j} + v_{itp} \tag{13}$$

Kao also suggested a DF test to be performed to the above equation. The DF type test is as follows (Kao, 1999: 8; Asteriou and Hall, 2007: 372):

$$DF_t^{*} = \frac{\dfrac{t_p + \sqrt{6N}\sigma_V}{2\sigma_{0V}}}{\sqrt{\dfrac{\sigma_{0V}^2}{2\sigma_V^2} + \dfrac{3\sigma_V^2}{10\sigma_{0V}^2}}} \tag{14}$$

The null hypothesis in the Kao test says that the cointegration does not exist. The test introduces the AR coefficients and the homogeneous cointegrated vectors. However, the cointegrated vector is not identified in case there are one or more than one cointegrated vectors (Yardimcioglu, 2013: 64).

This test which calculates the potential correlation between the differences of the constant term, error term and explanatory variables also substantially allows heterogeneousness between the individual segments. The nonparametric adaptation in this method solves the autocorrelation and endogeneity problem, and the long-term coefficients are estimated by regressing the adapted dependent variable onto the independent variables. The average group FMOLS long-run coefficients are obtained by averaging the group estimations. Pedroni (2000) indicated that the FMOLS test has a decent power on the minor samples by testing the power of this test on the minor samples through the Monte Carlo simulations (Kok and Simsek, 2006: 8). Pedroni (2000, 2001) also indicated through the formulas;

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$$y_{i,t} = \alpha_i + \beta x_{i,t} + \mu_{i,t}$$
$$x_{i,t} = x_{i,t-1} + \varepsilon_{i,t} \quad (15)$$

which are the general equations of the panel cointegration that the error term $\varepsilon_{i,t} = (\mu_{i,t}, \varepsilon_{i,t})$ is stationary with the Ω_i which is the asymptotic covariance matrix. Thus, the variables x_i, y_i are said to cointegrate for each member of the panel, with cointegrating vector if yit is integrated of order one (Pedroni, 2001: 98). Here, μ and ε are residual terms and are accepted as stationary. In this case, the variables will be cointegrated with the β cointegration vector for each of the horizontal segment in the panel. The panel is calculated with the FMOLS estimator β as follows (Akpolat, 2014: 5; Mitic et al., 2017: 8-9):

$$\beta_{NT}^{*} = N^{-1} \sum_{i=1}^{N=1} \left(\sum_{t=1}^{T} (x_{i,t} - x_i)^2 \right)^{-1} \left(\sum_{t=1}^{T} (x_{it} - x_i) Y_{it}^{*} - T\tau_i \right) \quad (16)$$

It is found with the calculations;

$$Y_{it}^{*} = (Y_{it} - Y_i) - \frac{L_{21i}}{L_{22i}} \Delta x_{it}$$
$$\tau_i = \Gamma_{2i} + \Omega_{21i}^{0} - \frac{L_{21i}}{L_{22i}} \left(\Gamma_{22i} + \Omega_{22i}^{0} \right) \quad (17)$$

In the equation (17), $\Omega_i = \Omega_i^0 + \Gamma_i + \Gamma_i^{'}$ indicates long-run covariance matrix where Ω_i^0 is the contemporaneous covariance and Γ_i is a weighted sum of dynamic covariances. $\Gamma_i^{'}$ is the lower triangular in the decomposition of Ω_i.

In order to determine validity of the causality relationships between economic growth, financial development, democracy index and human capital accumulation; and direction of the causality relationships the DH panel causality test developed by Dumitrescu and Hurlin (2012) was used in the study. This test can be employed when N is growing, and T is constant. Moreover, it can also be applied when T>N and when N>T. The test, which is based on VAR, assumes that there is no cross-sectional dependency (Akbas et al., 2013: 801). In this context, Dumitescu and Hurlin (2012) use the average of individual Wald statistics associated with the test of the noncausality hypothesis for units i = 1,…, *N* (Bilgili et al., 2017: 197). Within the mentioned test which provides consistent results even for the minor samples two different statistics are calculated (Dumitrescu and Hurlin, 2012):

$$W_{N,T}^{HNC} = \frac{1}{N} \sum_{i=1}^{N} W_{i,t}$$
$$Z_{N,T}^{HNC} = \sqrt{\frac{N}{2K}} \left(W_{N,T}^{HNC} - K \right) \rightarrow N(0,1) \quad (18)$$

by averaging the Wald statistics ($W_{i,t}$) calculated separately for each *N* horizontal segment in the panel, the panel statistic $W_{N,T}^{HNC}$ is obtained (Tatoglu, 2017: 155). The test's null hypothesis which says "a homogeneous form of the causality does not exist between the series" was tested against the alternative hypothesis which says "a heterogeneous form of the causality does exist between the series".

4. Empirical Findings

In this section, the results obtained as a result of the empirical analysis carried out for the relationships between the variables included by the empirical model established in the second section were presented. Accordingly; the panel unit root tests were used firstly in order to determine the stationarity processes of the series, then the validity of the long-term relationships between the variables is analysed through the panel cointegration tests, and the

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long-run coefficient estimations of the variables were carried out through the cointegration estimators. In the last stage, the causality relationships between the variables were determined and they were presented in this section. Finally, some policies were suggested in accordance with the results.

In the study in which the aim is to analyse the long-term effects of economic growth, human capital, democracy level and financial development on income inequality; primarily it is necessary to determine the stationarity levels of the series in order to study the validity of the long-term relationships, i.e. the cointegration relationships between the variables. This is because, the series should be stationary at the same level in other words they should be cointegrated (I(1)) from their first differences in order to analyse the cointegration relationships between the variables. Accordingly, the stationarity processes of the series were primarily analysed through the LLC and IPS panel unit root tests developed by Levin et al. (2002) and Im et al. (2003). The results of the panel unit root tests are presented in the Table 2.

Table 2: Panel Unit Root Tests

Variables	**LLS**		**IPS**	
Raw Data	**Intercept**	**Trend & Intercept**	**Intercept**	**Trend & Intercept**
lnGINI	0.454 (0.675)	-0.813 (0.207)	-0.731 (0.232)	-7.355*** (0.000)
lnGDP	1.695 (0.995)	-0.637 (0.261)	7.265 (0.998)	-1.179 (0.119)
lnFD	-0.602 (0.273)	0.264 (0.604)	0.752 (0.774)	0.046 (0.518)
$lnFD^2$	0.730 (0.767)	0.345 (0.635)	1.812 (0.965)	0.449 (0.673)
lnDEM	-2.895** (0.019)	0.309 (0.621)	-2.448*** (0.007)	-1.119 (0.131)
lnHC	-3.207*** (0.007)	-4.706*** (0.000)	0.858 (0.804)	-0.239 (0.405)
	Intercept	**Trend & Intercept**	**Intercept**	**Trend & Intercept**
ΔlnGINI	-4.169*** (0.000)	-5.310*** (0.000)	-9.983*** (0.000)	-8.343*** (0.000)
ΔlnGDP	-11.659*** (0.000)	-10.510*** (0.000)	-10.513*** (0.000)	-8.668*** (0.000)
ΔlnFD	-11.700*** (0.000)	-9.250*** (0.000)	-11.832*** (0.000)	-9.082*** (0.000)
$\Delta lnFD^2$	-11.385*** (0.000)	-7.299*** (0.000)	-11.378*** (0.000)	-8.256*** (0.000)
ΔlnDEM	-15.907*** (0.000)	-13.416*** (0.000)	-16.819*** (0.000)	-15.612*** (0.000)
ΔlnHC	-2.448** (0.012)	-2.721*** (0.000)	-2.462*** (0.000)	-3.160*** (0.000)

Note: *, ** and *** indicate the statistical significance in the levels 0.10, 0.05 and 0.01 respectively. The values between the parentheses are the probability values.
Source: Author's calculations.

When the results of the panel unit root tests developed by Levin et al. (2002) and Im et al. (2003) were analysed; it was observed that in the level values the variables GDP, FD and FD^2 contain unit roots according to both of the tests. The GINI variable contains unit roots according to the LLC test, and it is stationary in the model containing trends according to the IPS. The DEM variable is stationary in the models which contain constants and it contains unit roots in the models which contains trends. The HC variable contains unit roots according to the IPS test. In order to discuss the certain stationarity of the series, the series should be stationary in both models containing constants and models containing trends. After the first differences of the series were taken, the result rejecting the H_0 hypothesis which says all variables are stationary and the series contain unit roots was obtained. Accordingly, the variables are cointegrated from the first difference.

Being stationary in their first differences, thus being cointegrated at the same level enables seeking cointegration relationships between the variables. Accordingly, the cointegration tests developed by Pedroni (2001) and Kao (1999) were used in the study. The results of the cointegration tests are presented in the Table 3.

The Panel ADF and the Group-ADF statistics developed by Pedroni (2001) and the ADF statistic developed by Kao (1999) were based in the panel cointegration test and it was observed that the H_0 hypothesis which says that a cointegration does not exist between the variables for both tests was rejected. Accordingly, the coefficient Gini, real GDP, financial development, square of the financial development, democracy index and human capital index are cointegrated and they synchronise in the long-term.

Table 3: Panel Cointegration Test

Test	Statistic	Probability
Pedroni Panel-ADF	-3.391***	0.000
Pedroni Group-ADF	-3.946***	0.000
Kao-ADF	-1.714**	0.043

Note: *, ** and *** denote the statistical significance in the levels 10%, 5% and %1 respectively. **Source:** Author's calculations.

It is necessary to use long-term coefficient estimators in order to analyse the effects of the independent variables on the dependent variables as a result of their cointegration and synchronisation. Accordingly, the panel FMOLS coefficient estimator was used in order to both estimate the panels for developing economies and determines the effects separately for each country, and the results are presented in the Table 4.

Table 4: The Results of Panel FMOLS Estimator

Countries	lnGDP	lnFD	$lnFD^2$	lnDEM	lnHC
Arjentina	-0.302***	-3.473***	0.635***	0.108**	0.732*
	[0.008]	[0.000]	[0.000]	[0.042]	[0.093]
Bangladesh	-0.381	1.066**	-0.155**	0.008	1.718**
	[0.114]	[0.026]	[0.029]	[0.833]	[0.020]
Brazil	-0.146	-0.139	0.014	0.015	-0.182**
	[0.195]	[0.318]	[0.383]	[0.332]	[0.033]
Bulgaria	-0.415	-0.730	0.120	-0.042	0.545*
	[0.324]	[0.194]	[0.170]	[0.820]	[0.081]
Chile	-0.009	1.237**	-0.132**	0.074*	-0.976**
	[0.924]	[0.021]	[0.040]	[0.059]	[0.021]
Chinese	0.109	-4.522	0.489	-1.171	0.486
	[0.245]	[0.530]	[0.522]	[0.181]	[0.607]
Columbia	0.007	2.353***	-0.349***	0.053	0.116
	[0.970]	[0.003]	[0.003]	[0.222]	[0.686]
Hungary	-0.278*	0.467	-0.080	0.001	1.047**
	[0.087]	[0.459]	[0.352]	[0.990]	[0.036]
India	0.323	0.804	-0.111	0.076	-0.731
	[0.117]	[0.460]	[0.489]	[0.282]	[0.207]
Indonesia	0.530***	1.551***	-0.229***	0.102**	-0.535*
	[0.000]	[0.006]	[0.005]	[0.033]	[0.093]
Malaysia	0.405*	0.220	-0.029	0.548***	-0.981*
	[0.082]	[0.874]	[0.842]	[0.001]	[0.077]
Mexico	0.324**	-0.619	0.095	0.019	-0.819***
	[0.028]	[0.149]	[0.175]	[0.494]	[0.000]
Pakistan	0.176	-2.384	0.342	0.268***	0.160
	[0.514]	[0.297]	[0.349]	[0.009]	[0.621]
Peru	-0.305***	0.210	-0.020	0.006	-0.045
	[0.000]	[0.162]	[0.428]	[0.719]	[0.655]
Phillip	-0.221***	-0.796***	0.118***	0.067***	-0.526***
	[0.001]	[0.001]	[0.000]	[0.003]	[0.005]
Poland	-0.654	-0.132	0.028	-0.178	0.623
	[0.189]	[0.739]	[0.658]	[0.196]	[0.161]

Table 4: The Results of Panel FMOLS Estimator (cont.)

Countries	lnGDP	lnFD	$lnFD^2$	lnDEM	lnHC
Romania	0.120	0.218	-0.025	0.244***	-0.417
	[0.520]	[0.340]	[0.509]	[0.000]	[0.680]
Russia	-0.374***	-1.172***	0.205***	0.725***	-1.737***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.005]
South Africa	0.351*	1.579	-0.174	0.020	-0.278
	[0.087]	[0.337]	[0.312]	[0.131]	[0.208]
Thailand	0.240**	1.657	0.164	0.030*	-1.193***
	[0.026]	[0.240]	[0.264]	[0.089]	[0.000]
Turkey	0.212**	-0.420***	0.060***	0.026	-1.249***
	[0.022]	[0.005]	[0.004]	[0.130]	[0.000]
Ukraine	-0.481***	-0.193***	0.022	-0.064	3.034*
	[0.001]	[0.003]	[0.120]	[0.606]	[0.066]
Venezuela	0.046	0.217	-0.065	-0.036	-0.199*
	[0.734]	[0.559]	[0.303]	[0.452]	[0.091]
Group	**-0.412*** **	**-0.100*** **	**0.020*** **	**0.034***	**-0.541** **
	[0.000]	**[0.008]**	**[0.000]**	**[0.070]**	**[0.028]**

Note: *, ** and *** denote the statistical significance in the levels 0.10, 0.05 and 0.01 respectively. p-values are reported in square brackets.
Source: Author's calculations.

First of all; when the results of the FMOLS used in order to effects of the reel GDP, the financial development and its square, the democracy index and the human capital on the income inequality were analysed by observing the group average estimator presented in the Table 4; it was observed that 1% increase on real GDP decreased income inequality in 0.412%, 1% increase on democracy index (decrease on democracy level) increased income inequality in 0.034%, and 1% increase on human capital decreased income inequality in 0.541%. When the results were evaluated in terms of financial Kuznets hypothesis; it was determined that financial development coefficient is negative and the square of financial development is positive; accordingly, the relationship between financial development and income inequality is in U-shaped, not in inverted-U-shaped as indicated in the financial Kuznets hypothesis. In sum, the results indicate that in the developing economies, income inequality follows a firstly decreasing then an increasing course with financial development.

When the empirical results presented in the Table 4 are evaluated separately for each of the countries; the countries where the effects of real GDP on income inequality are negative, in other words where the increase on national production contributes proportionately more to the low-income segments of society are observed to be Argentina, Peru, Philippines, Russia and Ukraine. On the contrary, it is possible to say that in the countries such as Indonesia, Malaysia, Mexico, South Africa, Thailand and Turkey; increase on real GDP affects income distribution equity adversely and increase on national income contributes more to the high-income segments of society.

When the results are evaluated in terms of the effects of democracy level of the countries on income distribution; increase on democracy level increases income inequality for Argentina, Chile, Indonesia, Malaysia, Pakistan, Philippines, Romania, Russia and Thailand can be observed. The countries where increase on human capital accumulation decreases income inequality are Brazil, Chile, Indonesia, Malaysia, Mexico, Philippines, Russia, Thailand, Turkey and Venezuela. On the contrary; some results indicated that increase on human capital accumulation affects income distribution adversely in Argentina, Bangladesh, Bulgaria, Hungary and Ukraine.

Finally; when effects of financial development and the square of financial development on income inequality are analysed it can be observed that there is an inverted-U-shaped relationship between them, in other words, the countries where the financial Kuznets hypothesis exists are Bangladesh, Chile, Columbia and Indonesia. On the contrary; the

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countries where the U-shaped relationship between financial development and income inequality exists are Argentina, Philippines, Russia, Turkey and Ukraine.

The coefficient estimations showing the effects of the independent variables used in the model on the dependent variables indicate the relationships between the variables, however they cannot reveal the causality relationships between the variables. Therefore, the validity of the causality relationships between the variables and the directions of the relationships were analysed through the panel causality test developed by Dumtirescu and Hurlin (2012) and the results are presented in the Table 5.

When the results of the panel causality test are analysed; it can be observed that there is a bidirectional causality relationship between real GDP and the coefficient Gini; between financial development and the coefficient Gini; between the square of financial development and the coefficient Gini; between democracy and the coefficient Gini; between financial development and real GDP; between human capital and real GDP; financial development and human capital; and again, there is a bidirectional causality relationship between human capital and democracy. Additionally, there are some results which say that there is a unilateral causality relationship directed from human capital accumulation to the coefficient Gini and again there is a unilateral causality relationship directed from democracy level to GDP. On the contrary, it was determined that there is not any kind of causality relationship between financial development and democracy level.

5. Conclusion and Policy Recommendations

In recent years, the facts that the funds provided from financial system in the economic growth strategies of several countries are of vital importance and the majority of the economic crises are arisen from the financial sector attract attention as an indicator of the dependence of national economies around the world to the financial sector. Accordingly, the countries have been carrying out some reforms in order to get the maximum efficiency from the financial sector by keeping the financial segments under control and decreasing the financial vulnerability. Considering the facts that the financial development contributes to the economies by stimulating market capitalization and it also plays a crucial role for providing the funds required for the investments related to the development objects, the effect of financial development on the economic growth performances of the countries are frequently analysed in the theoretical and empirical studies. On the contrary, the effects of the output remaining as a result of the financial development on the welfare levels of the segments from different income levels, i.e. on the income distribution are generally ignored.

Even though there are several hypotheses on the effects of financial development on income distribution, it was observed that the most current discussions related to the relevant relationship are on the hypothesis named “Greenwood Jovanovich Hypothesis”. According to the hypothesis, at the beginning stages of financial development, the high-income segments of society benefit more from the relevant development due to the high-costs of resources and information asymmetry; and after the financial system reaches a specific level of maturity, the low-income segments of society find some chances to access to the loans increasing their own employment opportunities and income inequality thus decreases.

It is known that there are also hypotheses which say that in case the effects of financial development on income distribution and the funds provided from financial segment do not contribute to human capital accumulation in the country or having low democracy levels despite the strong financial system, income distribution equity is affected adversely. Correspondingly, the aim of the study is to analyse the validity of the financial Kuznets hypothesis for 23 developing countries and for the period of 1990-2013 without ignoring the variables national income, human capital and democracy level. The methods such as panel

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unit root, panel cointegration, panel long-run coefficient estimator and panel causality test were used in the study.

Table 5: The Results of Dumtirescu and Hurlin (2012) Panel Causality Test

Null Hypothesis	W-ist	Zbar-ist	Prob.
GDP ↛ GINI	7.323	9.354	0.000
GINI ↛ GDP	3.529	2.336	0.020
FD ↛ GINI	4.702	4.507	0.000
GINI ↛ FD	4.050	3.299	0.001
FD^2 ↛ GINI	4.726	4.551	0.000
GINI ↛ FD^2	4.064	3.325	0.001
DEM ↛ GINI	4.961	4.986	0.000
GINI ↛ DEM	4.293	3.750	0.000
HC ↛ GINI	5.695	6.344	0.000
GINI ↛ HC	1.936	-0.612	0.540
FD ↛ GDP	4.612	4.339	0.000
GDP ↛ FD	17.982	29.078	0.000
FD^2 ↛ GDP	4.520	4.169	0.000
GDP ↛ FD^2	18.454	29.951	0.000
DEM ↛ GDP	3.446	2.182	0.029
GDP ↛ DEM	2.180	-0.161	0.872
HC ↛ GDP	7.018	8.791	0.000
GDP ↛ HC	4.481	4.097	0.000
FD^2 ↛ FD	4.693	4.489	0.000
FD ↛ FD^2	4.771	4.633	0.000
DEM ↛ FD	3.049	1.448	0.148
FD ↛ DEM	2.703	0.807	0.420
HC ↛ FD	6.713	8.227	0.000
FD ↛ HC	5.033	5.118	0.000
DEM ↛ FD^2	2.877	1.129	0.259
FD^2 ↛ DEM	2.595	0.607	0.544
HC ↛ FD^2	6.644	8.099	0.000
FD^2 ↛ HC	4.768	4.628	0.000
HC ↛ DEM	5.525	6.028	0.000
DEM ↛ HC	6.435	7.713	0.000

Note: X ↛ Y indicates the null hypothesis which says, "a homogeneous causality relationship from X to Y is not valid."
Source: Author's calculations.

When the results of the study are evaluated in terms of panel; it is determined that increase on real national income decreases income inequality, decrease on democracy level increases income inequality, and increase on human capital accumulation decreases income inequality. Additionally, it was observed that the coefficient indicating financial development is positive and the coefficient of the square of financial development is negative. Based on those results, it is determined that the financial Kuznets curve hypothesis is invalid for the developing economies, and on the contrary, there is a U-shaped relationship between financial development and income inequality. The results are consistent with the results of the studies of Satti et al. (2015) and Jauch and Watzka (2016). When the results are evaluated separately for each country; it was determined that de-crease on democracy level increases income inequality in Argentina, Chile, Indonesia, Malaysia, Pakistan, Philippines, Romania, Russia and Thailand; increase on human capital accumulation decreases income inequality in Brazil, Chile, Indonesia, Malaysia, Mexico, Philippines, Russia, Thailand, Turkey and Venezuela. On the contrary; the results indicate that increase on human capital accumulation affects income distribution adversely in Argentina, Bangladesh, Bulgaria, Hungary and Ukraine. When the results were evaluated in terms of the validity of the financial Kuznets hypothesis based on the countries; it was determined that the hypothesis is valid for Bangladesh, Chile, Columbia and Indonesia. For Argentina, Philippines, Russia, Turkey and Ukraine; there is a U-shaped relationship between financial development and income inequality, in other words, the financial Kuznets hypothesis is not valid for those countries. As a result, along with the

maturation of the financial system, access to financial resources of the low-income segment is facilitated; therefore income distribution is affected positively. To sum up, according to this hypothesis, an inverted U-shaped relationship exists between financial development and income inequality. Finally, as a result of the panel causality test used in order to analyse the causality relationships between the variables, it was observed that there is a bidirectional causality relationship between financial development and real GDP. When the results of the panel causality test are analysed; it can be observed that there is a bidirectional causality relationship between real GDP and the coefficient Gini; between financial development and the coefficient Gini; between the square of financial development and the coefficient Gini; between democracy and the coefficient Gini; between financial development and real GDP; between human capital and real GDP; financial development and human capital; and again, there is a bidirectional causality relationship between human capital and democracy.

The experimental results of the paper suggest some policy implications to intensify income inequality in 23 developing countries. Accordingly; in developing countries, in order to enable the financial sector to contribute to all of the segments of society based on the inclusiveness principle it is necessary to enable loan access for the low-income segments of society, to make the capital spread to the base, to encourage the funds obtained from financial segments to be directed to more productive investment areas such as education and health, and thus to enhance the humanitarian development index, and also to enhance the democratic system providing the specific guarantees for the potential investors who will make the aforementioned investments. It is necessary to encourage inclusive development covering rural development policies, comprising income tax policies and publically financed services. Furthermore, efforts are required to improve institutional quality, control inflation and strengthen financial system in order to intensify income inequality in the region maximally. Accordingly, it is necessary to carry out micro and macro empirical studies related to the usage of the specific financial sector policies and programs as effective instruments for the enhancement of the income distribution in the developing countries. Moreover, the proliferation of the coronavirus (hereafter COVID-19) pandemic process, which started in January 2020 in many countries, caused changes in the fields of political, social, economic and cultural. Countries have made mandatory new regulations in the health economy and other fields (Karabag, 2020). For this reason, since it will be necessary to see the powers in the financial field, COVID-19 period should be evaluated and investigated their impact on the business world in the future studies.

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