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RESEARCH ARTICLE / ARAŞTIRMA MAKALESİ

The Relationship Among Trade Openness, Financial Development and Economic Growth Indicators and Income Distribution Inequality: Testing the Kuznets, Financial Kuznets, and Stolper-Samuelson Hypotheses

Ticari Açıklık, Finansal Gelişme ve Ekonomik Büyüme ile Gelir Dağılımı Adaletsizliği İlişkisi: Kuznets ve Finansal Kuznets Hipotezi ile Stolper-Samuelson Hipotezinin Testi

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ABSTRACT

This study investigates the complexities of the Kuznets, Financial Kuznets, and Stolper-Samuelson hypotheses, all of which hold fundamental positions in the literature. The primary objective is to scrutinize the intricate interplay among economic growth, financial development, trade openness, and income distribution inequality across nations and characterized by varying developmental stages. This analytical framework seeks to empirically evaluate the aforementioned hypotheses, specifically within the context of diverse clusters of countries. In this vein, a comprehensive investigation of the nexus connecting economic growth, financial development, trade openness, and income distribution inequality unfolds across a dataset encompassing 19 developing economies and 22 developed counterparts over the 2002-2019 period. The empirical assessment has been accomplished through a panel data analysis. The empirical findings shed light on distinctive patterns in the relationship between the specified economic factors and income inequality for the two distinct groups of countries. These empirical insights strengthen the validity of both the Kuznets and financial Kuznets hypotheses. However, the outcomes also exhibit a nuanced complexion in relation to the Stolper-Samuelson hypothesis. While the empirical underpinning within developed countries aligns with the Stolper-Samuelson premise, the observed outcomes in developing nations diverge from the tenets of the Stolper-Samuelson hypothesis, thereby introducing a layer of complexity to the overall findings.

Keywords: Kuznets hypothesis, financial Kuznets hypothesis, income distribution inequality, Stolper-Samuelson hypothesis, panel data analysis

Jel Code: C12, C23, E10

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ÖZ

Bu çalışmada, iktisat literatüründe önemli bir yere sahip olan Kuznets ve Finansal Kuznets ve Stolper-Samuelson hipotezleri kapsamında, ekonomik büyüme, finansal gelişme ve ticari açıklık ile gelir dağılımı eşitsizliği arasındaki ilişkinin farklı gelişmişlik seviyelerine sahip ülke ekonomileri için araştırılması ve ifade edilen hipotezlerin test edilmesi amaçlanmıştır. Buna göre 2002-2019 dönemi için gelişmekte olan 19 ülke ekonomisi ve gelişmiş 22 ülke ekonomisi için ticari açıklık, finansal gelişme ve ekonomik büyüme ile gelir dağılımı adaletsizliği arasındaki ilişki panel veri analiziyle araştırılmıştır. Analiz sonuçlarına göre 19 gelişmekte olan ülkede ticari açıklık %1 arttığında gelir dağılımı adaletsizliğini temsilen modelde kullanılan gini endeksi %0.13; finansal gelişmişlik %1 arttığında gini endeksi %0.27; ekonomik büyüme %1 arttığında ise gini endeksi %0.08 oranında artmaktadır. 22 gelişmiş ülkede ise ticari açıklık %1 arttığında gini endeksi %0.02; finansal gelişme %1 arttığında gini endeksi %0.05 azalmakta ve ekonomik büyüme %1 arttığında gini endeksi %0.001 oranında artmaktadır. Bu sonuçlar belirli bir gelişmişlik seviyesine kadar ekonomik büyüme ve finansal gelişmedeki artışların gelir dağılımı adaletsizliğini arttırdığını fakat belirli bir gelişmişlik seviyesinden sonra bu artışların gelir dağılımı adaletsizliğini azalttığını ifade eden Kuznets ve Finansal Kuznets hipotezlerini doğrular niteliktedir. Fakat çalışmada varılan sonuçlar, gelişmiş ülkeler için Stolper-Samuelson hipotezini doğrulamasına rağmen gelişmekte olan ülkeler için Stolper-Samuelson hipotezi için uyuşmayan bulgular içermektedir.

Anahtar Kelimeler: Kuznets Hipotezi, Finansal Kuznets Hipotezi, Gelir Dağılımı Adaletsizliği, Stolper-Samuelson Hipotezi, Panel Veri Analizi

Jel Sınıflaması: C12, C23, E10

Introduction

The elimination of income distribution inequality is an important issue among the goals of national economies. Although many factors affect income distribution inequality, the tendency toward commercial liberalization since the 1980s and financial liberalization since the 1990s have increased countries' interactions and caused any economic problem that broke out in once country to affect all countries of the world. This result emerges as a factor affecting countries' income distribution inequality.

Kuznets (1955) proposed a hypothesis stating that the economic growth achieved before reaching a certain level of development in a country's economy increases the inequality of income distribution and that after that level, the inequality of income distribution decreases with economic growth. According to this hypothesis, savers are high-income in the first stage of a country's economic development. In this case, the high-income segment will benefit from the high income of capital, which is already relatively scarce in underdeveloped and developing countries' economies, and will increase their income even more. In other words, income inequality increases. However, after the development level reaches a certain point, the relative abundance of capital will allow the low-income group to benefit from capital income; therefore, an increase will be observed in the income of this segment. In this case, income inequality is reduced. According to this hypothesis, an inverted U-shaped relationship exists between economic growth and income distribution inequality (Kuznets, 1955, p. 7).

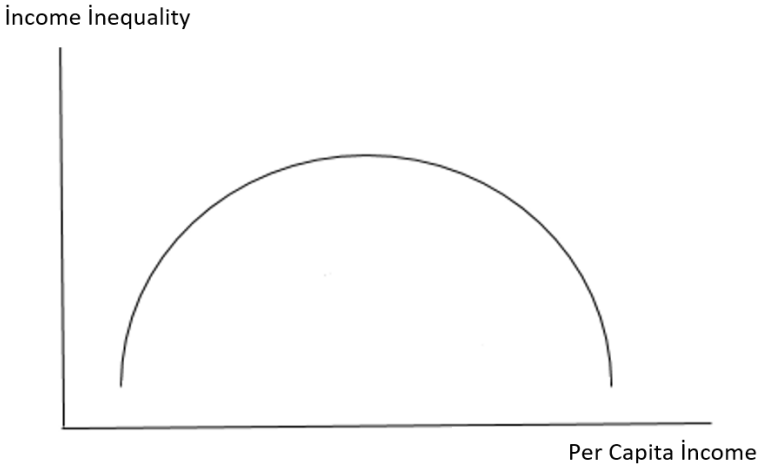

Figure 1. Kuznets curve (Source: Weil, 2016, p. 318).

This relationship is illustrated in Figure 1, which shows that as income inequality increases, per capita income increases up to a certain point, after which per capita income decreases as income inequality increases.

When looking at studies that reveal the relationship among financial liberalization, financial development, and income distribution inequality in this context, three pioneering studies are encountered. These studies were conducted by Galor and Zeira (1993), Greenwood and Jovanovic (1990), and Rajan and Zinglasdes (2003). While Galor and Zeira (1993) argued a negative relationship to exist between financial development and income inequality, Rajan and Zinglasdes (2003) argued the relationship to be positive. Meanwhile, Greenwood and Jovanovic (1990) stated that an inverted-U-shaped relationship exists between financial development and income inequality (as cited in Jauch & Watzka, 2012, p. 7).

Galor and Zeira (1993) developed a dynamic model for income distribution in an economy, in which generations are linked by inheritance and investment indivisibility. In this model, an economy exists in which a single good (for consumption and investment) is produced using skilled and unskilled labor-intensive technology. In addition, individuals' lives are divided into two periods, according to which individuals can work unskilled in both periods or individuals can work qualified in the second period as a result of having invested in capital and received education in the first period. In addition, the model considers individuals to be identical in terms of skills and preferences and to differ only in their inherited wealth. Individuals determine whether they will invest in capital or not, the level of inheritance they have, and the loans they receive under the imperfection of capital markets. Thus, wealthy people can work with the highest quality and leave a greater legacy to future generations by investing in human capital, whereas poorer people cannot. This leads to an increase in income inequality in the long run (Galor & Zeira, 1993, pp. 35–36). Having a low level of financial development makes the poor's ability to use credit, and therefore borrow money, very difficult. Providing financing for investments in this sector will result in serious changes regarding income levels. With an increase in the level of financial development (i.e., as financial markets develop) to the extent that capital market defects can be prevented, individuals with lower incomes will be able to borrow for high-yield investments, obtain capital, and expand their existing projects. Thus, income inequalities decrease as a result of the narrowing of income differences between high- and low-income individuals (Argun, 2006, p. 65).

Galor and Zeira (1993) attributed the relationship between financial development and income inequality to the fact that low-income people earn income through borrowing as a result of financial development; in this context, they can participate in the production process by investing. According to Galor and Zeira, low-income people in this case reduce their income gap with high-income people and reduce income inequality.

Rajan and Zingales (2003) argued financial development to be related to institutional quality and to benefit only wealthy individuals when the institutional quality is weak. Financial markets have such things as asymmetric information, adverse selection, and moral hazards, and therefore debtors need collateral to borrow money. While the rich have wealth that can provide collateral, low-income individuals who do not have this wealth cannot borrow money even if the country's economy is financially developed. In this case, as the financial sector develops, rich households can borrow more, whereas low-income households cannot benefit from this opportunity. Therefore, low-income individuals cannot possibly invest their capital or start a new business. As a result, only the rich benefit from financial development, thus increasing the income gap between rich and poor. As a result, financial development plays a role in widening income inequality. This hypothesis explaining income inequality in financial development is called the inequality widening hypothesis" (Clarke et al., 2006, pp. 578–580; Shahbaz et al., 2017, pp. 5–6).

Meanwhile, Greenwood and Jovanovic (1990) stated that when countries have an underdeveloped or developing structure, financial development comes into question; only high-income people can benefit from this development due to the high costs, and in this context, income inequality will increase. The increase in countries' development causes a decrease in costs, and access to financial instruments will become easier for the low-income segment. In this case, income inequality decreases. This view is in line with the Kuznets hypothesis. In this context, this hypothesis is called the financial Kuznets hypothesis (Hepsağ, 2017, p. 137).

A pioneering study examining the relationship between trade openness and income inequality was proposed by Stolper and Samuelson (1941). According to their study, trade openness favors the abundance factor and opposes the scarcity factor. In other words, the price of what is abundant will increase, as will cheap factors in this context, while the cost of what is scarce will decrease, as will expensive factors in this context. As a result, the differences in the percentages the factors have of income decrease, as does income distribution inequality. In line with these statements, the Stolper–Samuelson hypothesis argues that a negative relationship exists between trade openness and income distribution inequality. This hypothesis has been tested several times in various studies. For example, Barro (2000) found results supporting this hypothesis, while Spilimbergo et al. (1999) reached conclusions that did not support the hypothesis.

Within the scope of this information in the economics literature, the current study aims to investigate the relationship among trade openness, financial development, economic growth, and income distribution inequality for countries with

different levels of development and to test the stated hypotheses. The aim of this study is different from that of other studies. Few studies have investigated the effects of trade openness, financial development, and economic growth on income distribution. Therefore, this study is important for continuing the discussion on this subject in the literature.

In economics, the measure of income distribution inequality, which is the main variable of the study, is the Lorenz curve, as well as the Gini index in this context. The Gini index takes a value between 0 and 1, where 0 means that the income of the country is evenly distributed and 1 means that all of the country's income is collected in one person. Accordingly, as the Gini index approaches zero, income inequality decreases, and as it approaches one, income inequality increases. However, the Gini index as estimated by the World Bank takes a value between zero and 100. Here, as the value approaches 0, income inequality decreases, and as it approaches 100, income inequality increases (World Bank, 2022).

This study carries out panel data analyses to determine the relationship among trade openness, financial development, economic growth, and income distribution inequality in 19 developing and 22 developed economies for the 2002-2019 period. The models created for panel data analysis use the percentage of trade in Gross Domestic Product (GDP) to represent the variable of trade openness, the percentage of loans extended to the private sector in GDP to represent financial development, the real per capita income (in 2015 USD) to represent economic growth, and the Gini index to represent income distribution inequality. The models with these variables are first subjected to multiple linear correlation. Cross-sectional dependence (CSD) is then examined based on the models and variables. In this review, CSD is found to be present in each variable; therefore, a cross-sectionally augmented Dickey Fuller (CADF) second-generation unit root test is performed, which has the advantage of controlling for CSD. In the context of these test results for the models in the study, Westerlund's (2007) cointegration analysis and autoregressive distributed lag (ARDL) cointegration analyses have been applied. This study performs the augmented mean group (AMG) estimation and vector error correction model (VECM) panel causality analyses.

The following section provides the results of the literature review on the subject, with the next sections containing the models of the study and data information, the findings related to the analyses carried out using the method, and the interpretations of these findings. The conclusion section then evaluates the results of these analyses.

Literature Review

The literature on the relationship among trade openness, financial development, economic growth, and income distribution inequality, being the subject of this study, is presented in the form of studies investigating the effects of each of the mentioned variables on income distribution inequality. The reason for this is the literature has limited studies that have examined the effects of these variables on income inequality (i.e., Shahbaz & Islam, 2011; Satti et al., 2015; Ahmed & Masih, 2017; Cengiz & Demir, 2023). This also reveals the originality of this study. However, many studies have explained the effects of income distribution on trade openness, financial development, and economic growth.

The literature investigating the relationship between trade openness and income inequality involves some studies that have shown a negative relationship to exist between trade openness and income distribution inequality (e.g., Calderon & Chong, 2001; Değer, 2006; Gökalp et al., 2011; Dorn et al. 2021). However, the literature also has studies that have found a positive relationship to exist between trade openness and income inequality (Calderon & Chong, 2001; Mahesh, 2016; Zakaria & Fida, 2016; Khan & Nawaz, 2019; Wang et al., 2020; Dorn et al., 2021; Xu et al., 2021).

The relationship between financial development and income inequality is an intensively researched subject in the literature. Many studies have investigated this issue, with some showing a negative relationship to occur between financial development and income distribution inequality (e.g., Clarke et al. (2003), Batuo et al. (2010), Akbıyık (2012). However, the literature also has studies that have found a positive relationship between financial development and income inequality (Jauch & Watzka, 2012; Sehrawat & Giri, 2016; Younsi & Bechtini, 2018; Kar & Kar, 2019). Meanwhile, other studies in the literature have stated an inverted U-shaped relationship to exist between these variables (Akbıyık, 2012; Nikoloski, 2013; Topuz, 2013; Zhang & Chen, 2015; Park & Shin, 2015; Altunöz, 2015; Pata, 2020).

Most studies investigating the relationship between economic growth and income distribution inequality were developed to test the Kuznets hypothesis with some studies confirming the hypothesis and stating an inverted U-shaped relationship to exist between economic growth and income inequality (Paukert, 1973; Ahluwalia, 1976; Papanek & Kyn, 1986; Ogwang, 1995; Jha, 1996; Barro, 2000; Thornton, 2001; Topuz & Dağdemir, 2016; Şengür, 2020). Other studies also contain findings that have falsified the Kuznets hypothesis (Matyas et al., 1998; List & Gallet, 1999; Dişbudak & Süslü, 2009; Huang et al., 2012; Kiatrungwilaikun & Suriya, 2015; Çakmak & Tosun, 2017; Abdioglu et al., 2019).

Table 1. *Literature Review*

Author	Sample	Period	Variables	Method	Findings
Shahbaz and Islam (2011)	Pakistan	1971-2005	Trade openness, Financial Development, Economic Growth and Income Distribution Inequality	ARDL Analysis	There is a negative relationship between financial development and income inequality, and a positive relationship between trade openness and economic growth and income inequality.
Satti et al. (2015)	Kazakhistan	1991-2011	Trade openness, Financial Development, Economic Growth and Income Distribution Inequality	ARDL analysis	Negative direction between financial development and trade openness and income inequality; On the other hand, there is a positive relationship between economic growth and income inequality.
Ahmed and Masih (2017)	Malaysia	1970-2007	Trade openness, Financial Development, Economic Growth and Income Distribution Inequality	ARDL Analysis	There is a long-term and statistically significant relationship.
Cengiz and Demir (2023)	MIST	1987-2019	Trade Openness, Financial Openness, Economic Growth and Income Distribution Inequality	Panel Data Analysis	Economic growth has no effect on income inequality. Financial development affects income inequality more than trade openness.
The Literature Review on the Relationship between Trade Openness and Income Distribution Inequality					
Calderon and Chong (2001)	102 Developed Countries	1960-1995	Trade openness and Income Distribution Inequality	GMM Method	There is a positive relationship between trade openness and income distribution inequality in developed country economies and negative in developing country economies.

Table 1. Continued

Değer (2006)	68 Countries	1975-2002	Trade openness and Income Distribution Inequality	Panel Data Analysis	Negative Relationship
Gökalp et al. (2011)	Türkiye	1980-2001	Trade openness and Income Distribution Inequality	ARDL Anlaysis	Negative Relationship
Mahesh (2016)	BRIC	1991-2013	Trade openness and Income Distribution Inequality	GMM Method	positive Relationship
Zakaria and Fida (2016)	SAARC	1973-2012	Trade openness and Income Distribution Inequality	Panel Data Analysis	Positive Relationship
Khan and Nawaz (2019)	CIS	1990-2016	Trade openness and Income Distribution Inequality	Panel Data Analysis	Positive Relationship
Khan, Nawaz and Saeed (2020)	5 South Asian Countries	1990-2016	Trade openness and Income Distribution Inequality	GMM Method	Inverted-U Relationship
Wang et al. (2020)	58 Countries	2005-2014	Trade openness and Income Distribution Inequality	VECM Analysis	Positive Relationship
Dorn et al. (2021)	139 Countries	1970-2014	Trade openness and Income Distribution Inequality	OLS Method	Negative in Transition Economies, Positive in Developed Countries
Xu, Han, Dossou, and Bekun (2021)	Sub-Saharan Africa	2000-2015	Trade openness and Income Distribution Inequality	GMM Method	Positive Relationship
The Literature Review on the Relationship between Financial Development and Income Distribution Inequality					
Clarke et al. (2003)	Developing and Developed Country Groups	1960-1995	Financial Development and Income Distribution Inequality	Panel Data Analysis	Negative Relationship
Batuo et al. (2010)	22 African Countries	1990-2004	Financial Development and Income Distribution Inequality	GMM Method	Negative Relationship
Akbıyık (2012)	Developing and Developed Country Groups	2000-2010	Financial Development and Income Distribution Inequality	Panel Data Analysis	Negative Relationship
Jauch and Watzka (2012)	138 Countries	1960-2008	Financial Development and Income Distribution Inequality	Panel Data Analysis	Positive Relationship

Table 1. Continued

Nikoloski (2013)	161 Countries	1962-2006	Financial Development and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Topuz (2013)	High-income, upper-middle-income, and low- and low-middle-income country groups	1995-2011	Financial Development and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Zhang and Chen (2015)	China	1978-2013	Financial Development and Income Distribution Inequality	SVAR Analysis	Inverted-U Relationship
Park and Shin (2015)	162 Asian Contries	1960-2011	Financial Development and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Altunöz (2015)	Türkiye	1991-2014	Financial Development and Income Distribution Inequality	ARDL Anlysis	Inverted-U Relationship
Sehrawat and Giri (2016)	South Asian Countries	1990-2013	Financial Development and Income Distribution Inequality	Panel Data Analysis	Positive Relationship
Younsi and Bechtini (2018)	BRICS	1995-2015	Financial Development and Income Distribution Inequality	Panel Data Analysis	Positive Relationship
Kar and Kar (2019)	BRICS	1990-2014	Financial Development and Income Distribution Inequality	Panel Data Analysis	Positive Relationship
Pata (2020)	Türkiye	1987-2016	Financial Development and Income Distribution Inequality	CCR ve FMOLS Method	Inverted-U Relationship
The Literature Review on the Relationship between Economic Growth and Income Distribution Inequality					
Jha (1996)	132 Countries	1960-1992	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Matyas et al. (1998)	109 Countries	1970-1993	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Kuznets hypothesis is falsified.
List and Gallet (1999)	71 Countries	1961-1992	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Barro (2000)	100 Countries	1960-1995	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship

Table 1. Continued

Thornton (2001)	96 Countries	1990-1992	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Dişbudak and Süslü (2009)	Türkiye	1963-1998	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Huang et al. (2012)	USA	1917-2007	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Kiatrung wilaikun and Suriya (2015)	91 ülke	2000-2012	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Inverted-U Relationship
Topuz and Dağdemir (2016)	Group of low-income, middle-income and high-income countries	1995-2011	Economic Growth and Income Distribution Inequality	Panel Data Analysis	Positive in Low- and Middle-Income Countries, Negative in High-Income Countries
Çakmak and Tosun (2017)	Upper-middle and high-income country groups	2002-2013	Economic Growth and Income Distribution Inequality	Panel Data Analysis	U Relationship
Abdioğlu, Yamak and Yamak (2019)	Türkiye	1978-2016	Economic Growth and Income Distribution Inequality	ARDL Anlysis	U Relationship
Şengür (2020)	Transition Economies	1995-2013	Economic Growth and Income Distribution Inequality	Robust regression, clustered standard errors and Driscoll-Kraay estimator	Inverted-U relationship

Data and Model

This study uses two samples with different levels of development to investigate the relationship among trade openness, financial development, economic growth, and income distribution inequality. These samples include two groups, one with 19 developing countries and another with 22 developed countries in accordance with the World Bank 2021 classification. The 19 developing countries are Ukraine, Türkiye, Russia, Peru, Panama, Moldova, Kyrgyzstan, Kazakhstan, Indonesia, Honduras, Georgia, El Salvador, Ecuador, Dominican Republic, Costa Rica, Brazil, Bolivia, Belarus, and Armenia. The 22 developed countries are Austria, Belgium, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Czech Republic, Finland, Hungary, Israel, Estonia, the United States of America, Saudi Arabia, and Sweden (World Bank, 2021). Panel data analysis was carried out using the Eviews-12 and Stata-17.0 package programs with the annual data of the stated samples covering the 2002-2019 period. Information regarding the data used for the analyses performed in this study is presented in Table 2.

Table 2. *Information on Data*

Information on Data		
Lngini	Gini İndex	WDI*
Lntic	Trade (%GDP)	WDI*
Lnfin	Loans Extended to the Private Sector (%GDP)	WDI*
Lngdp	Real Per Capita Income (2015 $)	WDI*

Source:*World Development Indicators [WDI], 2022; https://databank.worldbank.org/source/world-development-indicators

The functional expressions of the two different models created for the two samples used in the study in line with its purpose are as follows:

$$lngini_{it} = a_{it} + lntic_{it} + lnfin_{it} + lngdp_{it} + u_{it} \quad (1)$$

$$lngini_{jt} = a_{jt} + lntic_{jt} + lnfin_{jt} + lngdp_{jt} + \mu_{jt} \quad (2)$$

In Models (1) and (2), $i = 1, 2, \ldots, 19$, $j = 1, 2, \ldots, 22$, and $t = 1, 2, \ldots, 18$, with *lngini* representing the income distribution inequality, *lntic* representing the trade's percentage of GDP, *lnfin* denoting loans extended to the private sector to represent financial development, and *lngdp* denoting the real per capita income to represent economic growth. The variables were included in the analysis by taking their natural logarithms.

Econometric Method

Various methods can be used to investigate the relationships among trade openness, financial development, economic growth, and income inequality. This study performs a panel data analysis because of its advantages (e.g., better interpretation of parameters, more degrees of freedom, fewer multicollinearity problems).

In addition to its advantages, multiple linear connections and CSD are common problems in panel-data analysis. In this context, these should be tested first in panel data analyses.

This study has tested multicollinearity using the Spearman correlation analysis and variance inflation factor (VIF) analysis. Meanwhile, CSD was tested with the Peseran cross-sectional dependence (CD; 2004), Breusch-Pagan CD Lagrange multiplier (CDLM; 1980), and Peseran CDLM (2004) analyses. The hypotheses regarding these tests are given in Equations 3 and 4.

$$H_0 : p_{ij} = p_{ji} = corr(u_{it}, u_{jt}) = 0, i \neq j, There\ is\ no\ dependency\ between\ horizontal\ sections. \quad (3)$$

$$H_a : p_{ij} = p_{ji} \neq 0, i \neq j, There\ is\ dependency\ between\ horizontal\ sections. \quad (4)$$

The next step is to apply the panel unit root test to find the integration order of the variables. Second-generation unit root tests have the advantage of checking CSD while verifying the stationarity of variables, and first-generation unit root tests that do not have this advantage are unreliable in the presence of CSD. For this reason, the study uses the covariate augmented Dickey Fuller (CADF) second-generation unit root test proposed by Peseran (2007) as based on the estimation from Equation 5:

$$\Delta Y_{it} = a_i + b_i y_{i,t-1} + \Sigma_{j=1}^{pi} c_{ij} \Delta Y_{i,t-j} + d_i t + h_i Y_{t-1}^{-} + \Sigma_{j=0}^{pi} \eta_u \Delta Y_{i,t-j}^{-} + \varepsilon_{i,t} \quad (5)$$

The hypotheses regarding the CADF test are given in Equations 6 and 7.

$$H_0 : b_i = 0, the\ series\ is\ stationary. \quad (6)$$

$$H_a : b_i < 0, the\ series\ is\ no\ stationary. \quad (7)$$

Cointegration analysis has been used to investigate the long-term relationships among the variables. First-generation panel cointegration analyses are ineffective at considering CSD. In this context, Westerlund's (2007) second-generation panel cointegration analysis has been performed for this sample, due to CSD being identified in the panel data of the study and the variables of trade openness, financial development, economic growth, and income distribution inequality having no unit roots in the first difference forms for the sample of 19 developing countries. This analysis provides more effective information compared to the first-generation cointegration analyses.

In Westerlund's (2007) analysis, Equations 8 and 9 are first calculated using the dynamic least squares method:

$$\Delta Y_{it} = \delta_i d_t + \lambda_i x_{i,t-1} \Sigma_{j=1}^{pi} a_{ij} \Delta Y_{i,t-1} + \Sigma_{j=0}^{pi} \lambda_i \Delta x_{i,t-j} + u_t \tag{8}$$

$$Y_{i,t-1} = \delta_i d_t + \lambda_i x_{i,t-1} \Sigma_{j=1}^{pi} a_{ij} \Delta Y_{i,t-1} + \Sigma_{j=0}^{pi} \lambda_i \Delta x_{i,t-j} + u_t \tag{9}$$

Then, the error correction coefficient and the standard deviation are estimated for the panel. Finally, panel cointegration statistics are calculated in line with Equations 10 and 11:

$$Y_{it} = \frac{a}{S.E(a)} \tilde{} N(0,1) \tag{10}$$

$$P_a = T_a \tilde{} N(0,1) \tag{11}$$

The selection of the hypotheses is decided in accordance with the obtained test statistics. The null hypothesis of this analysis states that no long-term relationships exist among the variables, while the alternative hypothesis states a long-term relationship does exist among the variables. Westerlund (2007) suggested that the test statistics obtained to consider CSD in the rejection or acceptance of these hypotheses should be compared with the critical bootstrap distribution values expressed in Chang (2004; as cited in Westerlund, 2007, p. 718).

Following the Westerlund (2007) cointegration analysis, elasticities were calculated for the 19 developing country samples using the AMG long-term estimator developed by Eberhardt and Bond (2009). This estimator takes CSD into account in the panel data set and makes an estimation using Equations (12) and (13), where $i = 1, 2, \ldots, N$ and $t = 1, 2, \ldots, T$:

$$y_{it} = \beta' x_{it} + u_{it}, u_{it} = a_i + \lambda_i' f_t + \mu_{it} \tag{12}$$

$$x_{mit} = \pi_{mi} + \delta_{mi}' g_{mt} + p_{1mi} f_{1mt} + \cdots + p_{nmi} f_{nmt} + v_{mit}, m = 1, \cdots, k \; ve \; f_{.mt} \subset f_t, f_t = \phi' f_{t-1} + \mu_t \; ve \; g_t = K' g_{t-1} + \mu_t \tag{13}$$

In the equations, x_{it} is the vector of the observable variables; f_t is the factors affecting the sections in common, while λ_i expresses the other factors affecting the sections. Meanwhile, m represents k observable variables, and $\lambda_i$represents the factor loadings specific to the sections. Based on these equations, an estimation is made in two stages in line with Equations 14 and 15. In the first step, the standard first difference OLS model is estimated by adding t–1 time dummy variables, and the coefficients of the time dummy variables are calculated. In the second step, the coefficients of the calculated time dummy variables are included in the model as independent variables, and the elasticities are obtained by averaging the equations calculated for each section:

$$y_{it} = a_i + b_i', x_{it} + c_{it} + d_i \hat{u}_t + \mu_{it} \tag{14}$$

$$\hat{} b_{AMG} = N^{-1} \Sigma_i \hat{} b_i \tag{15}$$

In the CADF unit root tests performed for the sample of 22 developed country samples as the second group, the integration orders of the variables were determined to differ. Therefore, the long-term relationships among the variables for this sample group were investigated using ARDL cointegration analysis. This analysis is performed by calculating Equations 16 and 17:

$$\Delta lngini_{it} = \alpha_0 + \alpha_1 lngini_{i,t-1} + \alpha_2 lntic_{i,t-1} + \alpha_3 lnfin_{i,t-1} + \alpha_4 lngdp_{i,t-1} + \Sigma_{j=1}^{p}\alpha_{5j}\Delta lngini_{i,t-j} + \Sigma_{j=0}^{p}\alpha_{6j} \Delta lntic_{i,t-j} + \Sigma_{j=0}^{p}\alpha_{7j}\Delta lnfin_{i,t-j} + \Sigma_{j=0}^{p}\alpha_{8j}\Delta lngdp_{i,t-j} + u_{it} \quad (16)$$

$$\Delta lngini_{it} = c_0 + \Sigma_{j=1}^{p} c_{1j}\Delta lngini_{i,t-j} + \Sigma_{j=0}^{p} c_{2j}\Delta lntic_{i,t-j} + \Sigma_{j=0}^{p} c_{3j}\Delta lnfin_{i,t-j} + \Sigma_{j=0}^{p} c_{3j}\Delta lnogdp_{i,t-j} + \lambda ECT_{i,t-1} + \mu_{it} \quad (17)$$

In Equation 16, a_0 is the constant term, u_t is the error term, a_1 - a_4 are the long-term parameters, and a_5 - a_8 refer to the short-term parameters. In Equation 17, λ is the correction rate parameter, which shows how much of the effect of a shock that occurs in the short term will disappear in the long term. $ECT_{i,t-1}$ is a lagged value of the residuals of the cointegration model from which the long-term relationship is obtained.

The hypotheses for this analysis are as follows:

$$H_0: a_1=a_2=a_3=a_4=0$$
$$H_a: a_1=a_2=a_3=a_4\neq 0$$

In the last stage of the panel data analysis, the study carries out a panel causality analysis within the scope of VECM to determine the existence and direction of the causality relationships among the variables. Panel causality analysis within the scope of VECM was carried out according to Equations 18-21:

$$\Delta lngini_{it} = a_0 + \Sigma_{j=1}^{n} a_{1i}\Delta lngini_{i,t-j} + \Sigma_{j=0}^{n} a_{2i}\Delta lntic_{i,t-j} + \Sigma_{j=0}^{n} a_{3i}\Delta lnfin_{i,t-j} + \Sigma_{j=0}^{n} a_{4i}\Delta lngdp_{i,t-j} + a_5 ECT_{i,t-j} + u_{1t} \quad (18)$$

$$\Delta lntic_{it} = \beta_0 + \Sigma_{j=1}^{n} \beta_{1i}\Delta lntic_{i,t-j} + \Sigma_{j=0}^{n} \beta_{2i}\Delta lngini_{i,t-j} + \Sigma_{j=0}^{n} \beta_{3i}\Delta lnfin_{i,t-j} + \Sigma_{j=0}^{n} \beta_{4i}\Delta lngdp_{i,t-j} + \beta_5 ECT_{i,t-j} + u_{2t} \quad (19)$$

$$\Delta lnfin_{it} = \delta_0 + \Sigma_{j=1}^{n} \delta_{1i}\Delta lnfin_{i,t-j} + \Sigma_{j=0}^{n} \delta_{2i}\Delta lngini_{i,t-j} + \Sigma_{j=0}^{n} \delta_{3i}\Delta lntic_{i,t-j} + \Sigma_{j=0}^{n} \delta_{4i}\Delta lngdp_{i,t-j} + \delta_5 ECT_{i,t-j} + u_{3t} \quad (20)$$

$$\Delta lngdp_{it} = \gamma_0 + \Sigma_{j=1}^{n} \gamma_{1i}\Delta lngdp_{i,t-j} + \Sigma_{j=0}^{n} \gamma_{2i}\Delta lngini_{i,t-j} + \Sigma_{j=0}^{n} \gamma_{3i}\Delta lntic_{i,t-j} + \Sigma_{j=0}^{n} \gamma_{4i}\Delta lnfin_{i,t-j} + \gamma_5 ECT_{i,t-j} + u_{4t} \quad (21)$$

Research Findings and Comments

The study first investigated the existence of any multicollinearity problem prior to the panel data analysis. This is because in the case of a multicollinearity problem, which expresses a correlation between independent variables in the model, the results obtained in terms of panel data analysis will not be reliable. Accordingly, the study used the Spearman correlation analysis and variance inflation factor (VIF) to examine whether any correlations are present among the independent variables in the model. The analysis results are given in Table 3. Accordingly, the correlation coefficients being determined to have values less than 0.50 in the Spearman correlation analysis and less than 5 for the VIF in the VIF analysis results informs that there is reveals no multicollinearity problem to be present in the model.

Table 3. *Multiple Linear Connection Test*

Spearman Correlation Analysis			
	Lntic	**Lnfin**	**lngdp**
Lntic	1.000	0.0179	-0.2822
Lnfin	0.0179	1.000	0.4713
Lngdp	-0.2822	0.4713	1.000
VIF Analysis			
	Coefficient of Variance		**Central VIF Value**
LnCAP	1.44		0.693
LnLAB	1.33		0.753
LnREN	1.12		0.891

Another issue to be investigated before the panel data analysis is CSD. The presence or absence of CSD is important for determining which tests to run in panel data analysis and for obtaining reliable results in this context. Accordingly, the Breusch-Pagan (1980) LM test, Peseran (2004) CD test, and Peseran (2004) CDLM test were performed to investigate the presence of CSD. The results of these tests for the panels in the study are given in Table 4.

Table 4. *Panel-Based CSD Test*

	First Model		Second Model	
	Statistics	**Probability**	**Statistics**	**Probability**
CDLM (Breusch,Pagan 1980)	1302.590	0.000	702.315	0.000
CDLM (Pesaran 2004)	61.189	0.000	21.927	0.000
CD (Pesaran 2004)	2.373	0.000	2.767	0.005

Each of the probability values of the CSD tests given in Table 3 was determined to be less than 0.05. This means that CSD is present in the panel and that a shock in any one country affects every other country. Due to CSD being detected in the panel, CSD then had to be investigated on the basis of the variables. Again, the Breusch-Pagan (1980) LM test, Peseran (2004) CD test, and Peseran (2004) CDLM test were performed to investigate CSD in terms of the variables, with the results being given in Table 5.

Table 5. *Variable-Based CSD Test*

	First Model		Second Model	
	CDLM (Breusch,Pagan 1980)			
	Statistics	**Probability**	**Statistics**	**Probability**
Lngini	1040.153	0.000	802.638	0.000
Lntic	668.532	0.000	1904.449	0.000
Lnfin	1034.969	0.000	1312.746	0.000
Lngdp	538.921	0.000	2350.793	0.000
	CDLM (Pesaran 2004)			
	Statistics	**Probability**	**Statistics**	**Probability**
Lngini	46.998	0.000	26.595	0.000
Lntic	26.903	0.000	77.855	0.000
Lnfin	46.718	0.000	50.327	0.000
Lngdp	19.894	0.000	98.621	0.000
	CD (Pesaran 2004)			
	Statistics	**Probability**	**Statistics**	**Probability**
Lngini	15.322	0.000	39.907	0.000
Lntic	2.625	0.008	34.986	0.000
Lnfin	15.816	0.000	8.874	0.000
Lngdp	14.831	0.000	38.656	0.000

Each of the probability values of the CSD tests given in Table 4 was determined to be less than 0.05. This determination means that each of the variables includes CSD. Accordingly, in order to test the degree to which the variables are integrated, the CADF second-generation unit root test was conducted, which has the advantage of controlling for CSD. The results from this test are given in Table 6.

Table 6. *Unit Root Test*

CADF Unit Root Test								
	First Model				Second Model			
	Level		First Difference		Level		First Difference	
	Constant	Constant and Trend	Constant	Constant and Trend	Constant	Constant and Trend	Constant	Constant and Trend
	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]
Lngini	-0.050	0.770	-4.452*	-3.012*	2.062	2.009	-4.455*	-3.928*
Lntic	-0.009	1.488	-4.266*	-3.259*	-1.152	0.291	-6.089*	-3.181*
Lnfin	0.166	-2.003	-2.075*	-1.585**	-2.704*	-2.183*	-4.865*	-4.247*
Lngdp	1.388	-3.992	-3.613*	-2.664*	1.689	1.496	-1.783*	-1.518**

Note: The constant term and trend are included in the model. * indicates the absence of a unit root at the 1% significance level. ** indicates the absence of a unit root at the 5% significance level.

According to the test results expressed in Table 5, all of the variables used in the first model of the study contain no unit roots in the first difference forms. The results from the second model of the study reveal that not all variables are integrated to the same degree, and some variables contain no unit root in their first difference forms, with *lnfin* giving the finding that the variable does not contain a unit root at the level.

Due to all the variables in the first model created for the sample of 19 developing countries containing no unit roots in the first difference forms, the long-term relationships among the variables in this model were investigated using the Wersterlund (2007) analysis, with the results being given in Table 7.

Table 7. *Westerlund (2007) Cointegration Analysis*

	Statistics	Asymptotic Probability Value	Bootstrap Probability Value
g_tau	-0.816	0.000	0.000
g_alpha	-1.050	0.000	0.000
p_tau	-3.072	0.000	0.000
p_alpha	-0.824	0.000	0.000

Note: The constant term and trend are included in the model. Asymptotic values, standard normal distribution; The bootstrap probability values were obtained from a 10,000 replicate distribution.

The analysis in Table 6 mainly took bootstrap probability values into account, due to the model containing CSD. However, both asymptotic and bootstrap probability values of all four tests performed in terms of the analysis indicate the presence of a cointegration relationship among the variables. In other words, a long-term relationship is present among the variables mentioned for at least one of the 19 countries that make up the panel.

Due to the determination of the cointegration relationship, long-term elasticities were calculated using the AMG analysis. According to these calculations given in Table 8, when trade openness increases by 1%, the Gini index used in the model to represent income distribution inequality increases by 0.13%. Also, when financial development increases

by 1%, the Gini index increases by 0.27%, and when economic growth increases by 1%, the Gini index increases by 0.08%.

Table 8. *AMG Analysis*

Variables	Coefficient	t-statistics	Probability
Lntic	0.130	0.37	0.058
Lnfin	0.272	0.98	0.027
Lngdp	0.084	1.07	0.028
SABİT	-3.593	20.51	0.000

In order to investigate the long-term relationships among the variables in the second model of the study, ARDL cointegration analysis was used as a result of knowing the variables contain no unit roots in different forms. For the ARDL analysis, the Hausman test was first performed to find whether the mean group (MG) estimator or pooled mean group (PMG) estimator is better. As a result of this test, a chi-square value of 1.31 was calculated, as well as a probability value of 0.245. This result shows the variables to be homogeneous in the long run. Accordingly, the PMG estimator is more efficient and consistent for the ARDL model. The results from the panel ARDL/PMG analysis performed in line with this information are given in Table 9.

Table 9. *Panel ARDL Long Term and Error Correction Model*

Long Term Model			
Variables	**Coefficient**	**Standard Deviation**	**t-statistics**
Lntic	-0.023*	0.000	5.49
Lnfin	-0.056*	0.007	-3.01
Lngpdp	0.001*	0.003	6.23
Short-run Error Correction Model			
Lntic	-0.002*	0.016	0.17
Lnfin	-0.335*	0.028	0.653
Lngpdp	0.002*	0.000	1.24
ECT	-0.581*	0.082	-7.03
Constant Term	16.773*	0.004	3.409

Note: * indicates the presence of cointegration at the 1% significance level.

According to the results in Table 9, when trade openness increases by 1%, the Gini index used in the model to represent income distribution inequality decreases by 0.02%. When financial development increases by 1%, the Gini index decreases by 0.05%, and when economic growth increases by 1%, the Gini index increases by 0.001%. The error correction coefficient obtained in the short-term error correction model is -0.581. Accordingly, when the Gini index (income distribution inequality) is exposed to a shock, the effect of this shock will disappear within an average of two years.

Finally, the panel VECM causality analysis was carried out to determine the direction of the relationship between the mentioned variables. The results of this analysis are given in Table 10. Accordingly, the test results for the first

model of the study are unidirectional, going from economic growth to income distribution inequality. This points to bidirectional causality relationships between economic growth and trade openness and between economic growth and financial development. Meanwhile, the test results for the second model of the study provide information about the existence of unidirectional causality relations going from economic growth to income distribution inequality and from financial development to income distribution inequality, as well as bidirectional causality between economic growth and financial development and between economic growth and trade openness.

Table 10. *Panel VECM Causality Analysis*

	First Model		Second Model	
Null Hypothesis	**F-Statistics**	**Probability**	**F-Statistics**	**Probability**
≠>gini				
Lnfin	0.297	0.585	34.675	0.000
Lntic	1.309	0.252	6.711	0.243
Lngdp	3.619	0.057	27.548	0.000
≠>lnfin				
lngini	1.598	0.206	4.131	0.530
Lntic	1.245	0.264	9.213	0.100
Lngdp	57.685	0.000	38.009	0.000
≠>lntic				
Lngini	0.017	0.864	5.220	0.389
Lnfin	0.140	0.707	9.062	0.106
Lngdp	3.421	0.064	41.892	0.000
≠>lngdp				
Lngini	1.000	0.317	7.392	0.193
Lnfin	15.831	0.000	84.854	0.000
Lntic	4.379	0.036	14.649	0.000

Conclusion

In line with the Kuznets hypothesis, economic growth and the increasing level of development in the period before developing countries reach a certain level of development are expected to increase income distribution inequality. This hypothesis also states that the economic growth gained after reaching a certain level of development will then reduce the income distribution inequality. Accordingly, an inverted-U-shaped relationship exists between economic growth and income distribution inequality. In addition, an inverted-U-shaped relationship also exists between financial development, which is one of the conditions of economic growth, and income distribution inequality within the framework of the financial Kuznets hypothesis. In the context of the Stolper-Samuelson hypothesis, a negative relationship is said to exist between trade openness and income distribution inequality. Within the scope of this information in the economics literature, this study has aimed to investigate the relationships among trade openness, financial development, economic growth, and income distribution inequality for countries with different levels of development and to test the stated hypotheses. The aim of this study has differed from that of other studies. Few studies have investigated the effects of trade openness, financial development, and economic growth on income distribution inequality. Therefore, this study is important for continuing the debate on this subject in the literature.

In line with the study's unique purpose, the paper has used panel data analysis to investigate the relationships among

trade openness, financial development, economic growth, and income distribution inequality for 19 developing and 22 developed economies for the 2002-2019 period. Within the scope of the panel data analysis, the study has used the Westerlund (2007) cointegration analysis, AMG analysis, and panel ARDL cointegration analysis. According to the results of the analyses for the group of 19 developing countries, when trade openness increases by 1% the Gini index used in the model to represent income distribution inequality increases by 0.13%, when financial development increases by 1%, the Gini index increases by 0.27%, and when economic growth increases by 1%, the Gini index increases by 0.08%. In the group of 22 developed countries, when trade openness increases by 1%, the Gini index decreases by 0.02%, when financial development increases by 1%, the Gini index decreases by 0.05%, and when economic growth increases by 1%, the Gini index increases by 0.001%.

In line with the Panel VECM causality analysis carried out to determine the direction of the relations in the study, a one-way causality relationship was also found going from economic growth to income inequality in the group of 19 developing countries, as well as bi-directional causality relationships between economic growth and trade openness and between economic growth and financial development. In the group of 22 developed countries, unidirectional causality relationships were determined going from economic growth to income inequality and from financial development to income inequality, as well as bidirectional causality between economic growth and financial development and between economic growth and trade openness.

These results confirm the Kuznets and financial Kuznets hypotheses, which state that increases in economic growth and financial development up to a certain level of development increase the income distribution inequality, after which these increases then reduce the income distribution inequality. However, although the results obtained in the study confirm the Stolper-Samuelson hypothesis for developed countries, these results contain inconsistent findings for the Stolper-Samuelson hypothesis with regard to developing countries.

These results contain compatible findings with the studies by Gökalp et al. (2011), Akbıyık (2012), Nikoloski (2013), Topuz (2013), Zhang and Chen (2015), Park and Shin (2015), Altunöz (2015), Pata (2020), Paukert (1973), Ahluwalia (1976), Papanek and Kyn (1986), Ogwang (1995), Jha (1996), Barro (2000), Thornton (2001), Topuz and Dağdemir (2016), and Şengür (2020).

Accordingly, the effects of trade openness, financial development, and economic growth on income distribution injustice depend on countries' development levels. In this context, the results that trade openness, financial development, and economic growth will yield should be taken into consideration according to the development levels of the country when policy makers plan policy implementations to reduce income distribution injustice.

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REFERENCES / KAYNAKLAR

Abdioğlu, Z., Yamak, N. & Yamak, R. (2019). Türkiye'de gelir eşitsizligi ve ekonomik gelişme arasındaki uzun dönem ilişkisi. *Mehmet Akif Ersoy Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 6*(3), 721–735.

Ahluwalia, M.S. (1976). Inequality, poverty and development. *Journal of Development Economics, 3*, 307–342.

Ahmed, A. & Masih M. (2017). What is the Link Between Financial Development and Income Inequality? Evidence from Malaysia. MPRA, No: 79416, 1–27

Akbıyık, C. (2012). Cross-Country Evidence On Financial Development-Income Inequality Link. Yayınlanmamıs Yuksek Lisans Tezi, ODTU.

Altunöz, U. (2015). Kuznet Eğrisi Bağlamında Türkiye'de Finansal Gelişme ve Gelir Eşitsizliği İliskisinin Analizi. International Conference On Eurasian Economies Bildiriler Kitabı, 871–875.

Argun, A. I. (2006). Gelişmekte Olan Ülkelerde Finansal Gelişme ve Gelir Eşitsizliği, *İstanbul Üniversitesi Sosyal Bilimler Dergisi, (2016/1)*, 61–74.

Barro, R. J. (2000). Inequality and Growth in a Panel of Countries. *Journal of economic growth, 5*(1): 5–32.

Batuo, M., Guidi, F. & Mlambo, K. (2010). Financial Development and Income Inequality: Evidence from African Countries. MPRA, 1–27.

Breush, T. S. & Pagan, A. R. (1980). The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *The Review of Economic Studies, 47*(1), 239–253.

Calderon, C. & Chong, A. (2001). External sector and income inequality in interdependent economies using a dynamic panel data approach. *Economics Letters, 71*(2), 225–231. https://doi.org/10.1016/S0165- 1765(01)00374-3 (Er. Tar: 25.09.2022).

Cengiz, V. & D. Sedanur (2023). Trade Openness, Financial Openness and Income Inequalty: Empirical Evidence for MIST Countries. *International Journal of Economics, Business and Politics, 7*(1), 16–27.

Clarke, G., Xu, L. C. & Zou H. (2003). Finance and Income Inequality Test of Alternative Theories. The World Bank Development Research Group Investment Climate, 1, 1–24. Finance and Income Inequality: Test of Alternative Theories (findevgateway.org) (Er. Tar: 02.09.2022).

Cakmak, A. I. & Tosun, B. (2017). Ekonomik buyume-gelir dagılımı iliskisi: Kuznets hipotezinin secilmis ulkeler uzerine arastırılması. *Kosbed, 33*, 33–44.

Deger, M. K. (2006). Ticari Liberalizasyon ve Gelir Dağılımı: Gelişmekte Olan Ülkeler Uzerine Bir Analiz. *Ankara Üniversitesi SBF Dergisi, 61*(2), 63–87.

Disbudak, C. Suslu B. (2009). Kalkinma Ve Bireysel Gelir Dagilimi: Kuznets Hipotezi Turkiye Icin Gecerli Mi?. Akdeniz University Faculty of Economics & Administrative Sciences Faculty Journal/Akdeniz Universitesi

Dorn, F., Fuest, C. & Potrafke, N. (2022). Trade openness and income inequality: New empirical evidence. *Economic Inquiry, 60*(1), 202–223. https://doi.org/10.1111/ecin.13018 (Er. Tar: 04.08.2022).

Dunya Bankası, 2021, https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and- region.html (Er. Tar: 26.08.2023).

Eberhart, M. & Bond, S. R. (2009). Cross-sectional Dependence in Non-stationary Panel Models: A Novel Estimator. MPRA Paper, University Library of Munich, Germany.

Galor, O., & Zeira, J. (1993). Income Distribution and Macroeconomics. *The Review of Economic Studies, 60*(1), 35–52.

Gökalp, M. F., Baldemir, E. & Akgun, G. (2011). Tükiye Ekonomisinde Dışa Açılma ve Gelir Eşitsizlikleri İlişkisi. *Yönetim ve Ekonomi, 18*(1), 87–104.

Hepsag, A. (2017). Finansal Kuznets Egrisi Hipotezi: G-7 Ulkeleri Ornegi. *Sosyal Guvenlik Dergisi, 7*(2), 135–156.

Huang, H. C., Yi-Chen L. & Chih-Chuan Y. (2012). An appropriate test of the Kuznets hypothesis. *Applied Economics Letters, 19*(1), 47–51.

Jauch, S. & Watzka S. (2012). Finance and Income Inequality: A Panel Data Approach. 3687, Cesifo Working Papers, 1–47. Microsoft Word - JauchWatzka_Financial Development and Income Inequality_Aug2012_v10 (free.fr) (Er. Tar: 02.08.2022).

Jha, S. K. (1996). The Kuznets curve: A reassessment. *World Development, 24*(4), 773–780.

Kar, B. B. & Kar, M. (2019). Finansal Gelisme ve Gelir Esitsizligi: BRICS Ekonomileri Icin Dinamik Heterojen Bir Yaklasım. *Anadolu Universitesi Sosyal Bilimler Dergisi, 19*(1), 27–46.

Khan, I. & Nawaz, Z. (2019). Trade, FDI and Income Inequality: Empirical Evidence from CIS. *International Journal of Development Issues, 18*(1), 88–108.

Khan, I., Nawaz, Z. & Saeed, B. B. (2020). Does trade openness and FDI reduce inequality? Evidence from South Asia. *International Journal of Finance & Economics*, 1–12.

Kiatrungwilaikun, N. & Suriya, K. (2015). Rethinking inequality and growth: The Kuznets curve after the Millennium. *International Journal of Intelligent Technologies and Applied Statistics, 8*(2), 159–169.

Kuznets, S. (1955). Economic Growth and Income Inequality. *The American Economic Review, 45*, 1–28.

List, J. A. & Gallet, C. A. (1999). The Kuznets Curve: What Happens After the Inverted-U?. *Review of development economics, 3*(2), 200–206.

Mahesh, M. (2016). The effects of trade openness on income inequality–evidence from BRIC countries. *Economics Bulletin, 36*(3), 1751–1761. http://www.accessecon.com (Er. Tar: 04.08.2022).

Matyas, L., Konya L. & Macquarie L. (1998). The Kuznets U-curve hypothesis: some panel data evidence. *Applied Economics Letters, 5*(11), 693–697.

Nikoloski, Z. (2013). Financial Sector Development and Inequality: Is There A Financial Kuznets Curve?. *Journal of International Development, 25*, 897– 911

Ogwang, T. (1995). The Economic Development-Income Inequality Nexus. *American Journal of Economics and Sociology, 54*(2), 217–229.

Papanek, G. F. & Kyn O. (1986). The effect on income distribution of development, the growth rate and economic strategy. *Journal of Development Economics, 23*(1), 55–65.

Park, D. & Shin, K. (2015). Economic Growth, Financial Development, and Income Inequality. Asian Development Bank Economics Working

Paper Series, (441). Economic Growth, Financial Development, and Income Inequality (adb.org) (Er. Tar: 02.08.2022).

Pata, U. K. (2020). Finansal Gelismenin Gelir Esitsizligi Uzerindeki Etkileri: Finansal Kuznets Egrisi Hipotezi Turkiye Icin Gecerli mi?. *Ataturk Universitesi Iktisadi ve Idari Bilimler Dergisi, 34*(3), 809–828.

Paukert, F. (1973). Income Distribution at Different Levels of Development: A Survey of Evidence. *International Labour Review 108*, 97–125.

Pesaran, M. H. (2004). General Diagnostic Tests for Cross Section Dependence in Panels. CESifo Working Paper, No. 1229.

Pesaran, M. H. (2007). A Simple Panel Unit Root Test in the Presence of Cross-Section Dependence. *Journal of Applied Econometrics, 22*(2), 265–312.

Thornton, J. (2001). The Kuznets inverted-U hypothesis: panel data evidence from 96 countries. *Applied Economics Letters, 8*(1), 15–16.

Satti, S., Mahalik, M., Bhattacharya, M. & Shahbaz, M. (2015). Dynamics of Income Inequality, Finance and Trade in Kazakhstan: Empirical Evidence from a New Transition Economy with Policy Prescriptions. *Monash Business School, 36*(15), 1–40.

Sehrawat, M., & Giri, A. K. (2016). Financial development, povertyandrural–urban incomeinequality: evidencefrom South Asian countries. *Quality&Quantity*, 50(2), 577–590.

Shahbaz, M. & Islam, F. (2011). Financial Development and Income Inequality in Pakistan: An Application of ARDL Approach. MPRA, No: 28222, 1–20.

Spilimbergo, A., Londono, J. L. & Szekely, M. (1999). Income Distribution, Factor Endowments, and Trade Openness. *Journal of Development Economics, 59*, 77–101.

Stolper, W. & P. Samuelson (1941). Protection and Real Wages. *The Review of Economic Studies, 9*(1), 58–73 | 10.2307/2967638 (Er. Tar: 11.10.2022).

Sengur, M. (2020). Gelir esitsizligi ve ekonomik buyume iliskisi: Gecis ekonomileri uzerine panel veri analizi. *Eskisehir Osmangazi Universitesi IIBF Dergisi, 15*(1), 331–346.

Topuz, S. G. (2013). Finansal gelisme surecinde gelir esitsizligi: Bir panel veri analizi (Yayımlanmamıs Yuksek Lisans Tezi). Eskisehir Osmangazi Univeristesi, Sosyal Bilimler Enstitusu.

Topuz, S. G. & Dagdemir, O. (2016). Ekonomik buyume ve gelir esitsizligi iliskisi: Kuznets ters-u hipotezi'nin gecerliligi. *Eskisehir Osmangazi Universitesi IIBF Dergisi, 11*(13), 115–130.

Wang, M., Park, N. & Choi, C. H. (2020). The nexus between international trade, FDI and income inequality. *Journal of Korea Trade, 24*(4), 18–33. https://doi.org/10.35611/jkt.2020.24.4.18 (Er. Tar: 01.08.2022).

WB, (2022). World Bank Indicator, https://data.worldbank.org/, (Er. Tar: 12.08.2022).

Weil, D. (2016). Economic Growth. International Edition: Routledge

Westerlund, J. ve Edgerton D. L. (2007). A Panel Bootstrap Cointegration Test. *Economics Letters, 97*(3), 185–190.

Xu, C., Han, M., Dossou, T.A.M. & Bekun, F.V. (2021). Trade openness, FDI, and income inequality: Evidence from Sub-Saharan Africa. *African Development, 33*(1), 193–203. https://doi.org/10.1111/1467-8268.12511 (Er. Tar: 02.08.2022).

The World Bank, (2022). World Development Indicators. https://databank.worldbank.org/source/world-development-indicators#. Erisim Tarihi: 12.10.2022)

Younsi, M. & Bechtini, M. (2018). Economic Growth, Financial Development and Income Inequality in BRICS Countries: Evidence from Panel Granger Causality Tests. MPRA, 1–15.

Zakaria, M. & Fida, B.A. (2016). Trade openness and income inequality in China and the SAARC Region. *Asian- Pacific Economic Literature, 30*(2), 33–44. https://doi.org/10.1111/apel.12152 (Er. Tar: 04.08.2022).

Zhang, Q. & Chen, R. (2015). Financial Development and Income Inequality in China: An Application of SVAR Approach. Procedia Computer Science.

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