Ankara Avrupa Çalışmaları Dergisi Cilt:19, No:2 (Yıl: 2020), s. 327-364

WHAT CAUSES INCOME INEQUALITY: ECONOMIC GROWTH OR FINANCIAL DEVELOPMENT?

Merter AKINCI[*]
Gönül YÜCE AKINCI[**]
Ömer YILMAZ[***]
Araştırma Makalesi

Abstract

The paper investigates the linkage between growth, finance and inequality in the light of inverted-U hypothesis in the European Union member countries in the period 1995-2018. The findings of the multiple equations analysis indicate that economic growth and financial development act together, implying that growth boosts finance and vice versa. In addition, while the paper does not support the Kuznets hypothesis, the findings confirm the Greenwood-Jovanovic hypothesis, suggesting that the linkage between financial development and inequality is quadratic. That is to say, in the first phase of development, development of the financial markets is related to income inequality positively, however beyond the threshold level of finance, the linkage between finance and inequality becomes negative.

Keywords: *Economic Growth, Financial Development, Income Inequality, Inverted-U Hypothesis, Simultaneous Equation System*

Gelir Eşitsizliğine Sebep Olan Nedir: Ekonomik Büyüme mi Yoksa Finansal Kalkınma mı?

Öz

Bu çalışma, ters-U hipotezi bağlamında büyüme, finans ve eşitsizlik arasındaki ilişkileri Avrupa Birliği'ne üye ülkeler bağlamında 1995-2018 periyodu itibariyle

[*] Doç. Dr., Ordu Üniversitesi Ünye İktisadi ve İdari Bilimler Fakültesi, İktisat Bölümü, Ünye/Ordu, makinci86@gmail.com, orcid.org/0000-0002-5449-0207.
[**] Doç. Dr., Ordu Üniversitesi Ünye İktisadi ve İdari Bilimler Fakültesi, İşletme Bölümü, Ünye/Ordu, gyuce81@gmail.com, orcid.org/0000-0002-5900-7114.
[***] Prof. Dr., Atatürk Üniversitesi İktisadi ve İdari Bilimler Fakültesi, Ekonometri Bölümü, Merkez/Erzurum, omeryilmaz@atauni.edu.tr, orcid.org/0000-0002-2951-8749.
Makalenin Gönderilme Tarihi: 20/04/2020 Kabul Edilme Tarihi: 24/06/2020

araştırmaktadır. Çoklu denklem analiz bulguları, ekonomik büyüme ve finansal kalkınma sürecinin birlikte hareket ettiğini, bir diğer deyişle ekonomik büyümenin finansal kalkınmayı ve finansal kalkınmanın da büyümeyi hızlandırdığını ortaya koymuştur. İlaveten çalışma, Kuznets hipotezini desteklememekle birlikte, bulgular finansal kalkınma ve eşitsizlik arasındaki ilişkilerin kuadratik olduğunu öne süren Greenwood-Jovanovic hipotezinin geçerli olduğunu teyit etmiştir. Bir başka şekilde ifade etmek gerekirse, kalkınma sürecinin ilk safhasında finansal piyasaların gelişim sürecinin gelir eşitsizliği ile pozitif yönlü bir ilişki içinde olduğu, ancak finansal sistemin belirli bir eşik değerini aşmasını takiben finans ve eşitsizlik arasındaki ilişkilerin negatif olduğu bulunmuştur.

Anahtar Kelimeler: *Ekonomik Büyüme, Finansal Kalkınma, Gelir Eşitsizliği, Ters-U Hipotezi, Eşanlı Denklem Sistemi*

Introduction

Ever since Schumpeter, the linkages between finance and growth have been substantially investigated.[1] It is understood that the development of financial markets is vital for economic growth. Moreover, the causality nexus between finance and growth is crucial since it has a significant matter for development paths.[2] Schumpeter claims that improvement of financial markets boosts technology-driven innovations and economic growth by funding entrepreneurs and by transferring capital to entrepreneurs for higher profits.[3]

In this context, the nexus between finance and growth is gathered around the two main concepts. The first concept is *demand following*. This hypothesis asserts that the development of financial markets is an ongoing result of the comprehensive growth. The demand for financial activities depends on the real product growth. The faster the economic growth rate, the greater the demand for financial capitals and financial services will be.[4] The second concept, *supply leading*, implies that developed financial institutions might improve long-term growth. Financial markets spirit up division of labor alongside the adoption and expansion of knowledge and might decrease the transfer cost of savings, therefore easing investments. Besides,

---

1 Joseph A. Schumpeter, *The Theory of Economic Development*, (Cambridge: Harvard University Press, 1911).

2 Cesar Calderon and Lin Liu, L, "The Direction of Causality between Financial Development and Economic Growth", *Journal of Development Economics* 72, (2003): 321-334.

3 Schumpeter, *The Theory of Economic Development*.

4 Hugh T. Patrick, "Financial Development and Economic Growth in Underdeveloped Countries", *Economic Development and Cultural Change* 14, (1966): 174-189.

developed financial institutions make the trading financial properties covered since they permit account owner buying and selling of financial assets whenever they want and however they want to modify their portfolio investments. Convenient access to financial markets promotes the distribution of capital, a vital indicator of growth. Therefore, it can be claimed that savings and investments might guarantee long-term growth, also.[5] Accordingly, it can be said that there are two objectives of supply leading phenomenon: transferring funds from conventional sectors to modern ones and improving and stimulating an enterprising impulse in modern sectors. Financial markets transferring funds from traditional sectors to modern ones are similar to the Schumpeterian view of innovative funding.[6]

In most countries the failure of the allocation of growth benefits between rich and poor have attracted the attention of economists and the scholars of economics have begun to examine the linkage between growth and inequality more seriously. In this context, the main questions have come to light: Does economic growth give rise to unequal income distribution and does per capita income have to reach a threshold value before income inequality starts to reduce? The answer of the questions which embody a linkage between growth and inequality was introduced first by Kuznets[7] and called as the *Kuznets Hypothesis*. This hypothesis asserts that inequality expands in the early stage of growth, it rests stable for awhile and gets tight in the later stage of growth. The hypothesis explaining growth-inequality nexus in the light of transition process of a society from pre-industrial to industrial era indicates a quadratic linkage and therefore known as the *Kuznets Curve* or *Inverted U-Shaped Curve*.

Although notional and methodological literature on development of financial markets is predominantly interested in how finance impacts economic growth, it gives less attention to the impacts of finance on inequality. To eliminate this shortage in the literature, Greenwood and Jovanovic[8] introduce a hypothesis, suggesting a nonlinear linkage between

---

[5] Philip Arestis, Panicos O. Demetriades and Kul B. Luintel, "Financial Development and Economic Growth: The Role of Stock Markets", *Journal of Money, Credit and Banking* 33, (2001): 16-41.

[6] Patrick, "Financial Development and Economic Growth in Underdeveloped Countries", 174-189.

[7] Simon Kuznets, (1955) "Economic Growth and Income Inequality", *The American Economic Review* 45, (1955): 1-28 and Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations: Viii. Distribution of Income by Size", *Economic Development and Cultural Change* 11, (1963): 1-80.

[8] Jeremy Greenwood and Boyan Jovanovic, "Financial Development, Growth and Distribution of Income", *Journal of Political Economy* 98, (1990): 1076-1107.

finance, inequality and growth. At all phases of growth, development of financial markets improves allocation of capital, raises economic growth, and assists poor by means of the mechanism mentioned. Nevertheless, depending on the stage of economic development, the distributive impact of financial returns and therefore the net effect on the poor arises. At early phases of development, rich may just able to enter financial markets and make financial returns. At higher stages of development, most of people can join financial markets because development of financial institutions rightly gives a larger part of population the benefit of financial returns.[9] In this context, the model introduced by Greenwood and Jovanovic[10] point out how development of the financial institutions may bring about inverted U-shaped linkages between finance and inequality and therefore it is known as the *Greenwood-Jovanovic Inverted U-Shaped Hypothesis*.

Studies on growth, finance and inequality are more inadequate compared to researches on the growth-finance nexus. Therefore, in order to eliminate the deficiency in the literature considering the linkage between growth, finance and inequality, the paper tries to determine the validity of the Kuznets and the Greenwood-Jovanovic Hypothesis by using panel simultaneous equation systems in the EU member countries for the period of 1995-2018. Specifically, first of all, the paper investigates the relationship between growth and financial market development in the light of *demand following* and *supply leading*. Secondly the paper analyzes whether growth and finance affects income inequality in accordance with inverted U-shaped hypothesis. In other words, this study extends econometrical methods to income inequality and examines the theories regarding the effects of finance and growth on inequality. For this purpose, the validity of the Greenwood-Jovanovic and the Kuznets Inverted U-shaped Hypotheses are investigated for the EU member countries and panel methods are applied to account for the linkages between finance, growth and inequality. This analysis finds evidence the validity of the Greenwood-Jovanovic Hypothesis, suggesting the linkage between finance and inequality is quadratic. That is to say, at a lower stage of the development, finance is positively linked to inequality, but when a threshold level of the development is achieved, the nexus between related variables turns negative. In addition, the paper examines the effects of integration movements on income distribution and investigates the effects of the enlargement of the European Union, which is one of the most important economic integration in the world, on income inequality. Since

[9] Stijn Claessens and Enrico Perotti, "Finance and Inequality: Channels and Evidence", *Journal of Comparative Economics* 35, (2007): 748-773.

[10] Greenwood and Jovanovic, "Financial Development, Growth and Distribution of Income", 174-189.

this study is based on an analysis of the group of countries with the largest integration movement in the world, the paper investigates the effects of the enlargement of the European Union on income inequality. Because there is no study in the literature examining the relations between finance, growth, integration and inequality as a whole, this study aims to eliminate this deficiency in the existing literature. The main question asked in the context of the European integration movement is that whether there is a quadratic relationship between integration and income inequality, in other words, whether European integration has a threshold level in terms of influencing income inequality. Therefore, European integration is taken into account for robustness check and the findings indicate that at the lower level of integration inequality deteriorates, however at the higher level of integration inequality decreases. Undoubtedly, although income inequality has many socio-economic determinants, the main purpose of this study is not to investigate what these determinants are. Therefore, this study mainly analyzes the relationships between finance and growth in the first phase, and in the second phase it examines the effects of finance and growth on income inequality in the context of the inverted-U shaped hypothesis. Besides, the quadratic effect of European integration on inequality is questioned in the paper, as well. Therefore, using 2SLS analysis in estimating the simultaneous equation models and applying dynamic panel analysis in determining the threshold levels are an additional contribution to the literature.

The organization of the paper is as follows: In the first section, we briefly explain the linkage between growth, finance and inequality in the EU. The literature review between mentioned variables is introduced in Section 2. We then explain the data set and the econometric model that we test in Section 3. We show the findings of the econometric analysis in Section 4 and the paper comes to an end in conclusion section.

I. Growth, Finance and Inequality in the EU

In economics, the fundamental hypothesis suggesting the idea that growth creates inequality or *vice versa* is widely examined. However, satisfying replies have not been given to the phenomenon so far. Besides, a new variable, financial development is added into the nexus between growth and inequality nowadays. Accordingly, the phenomenon of income inequality has become the center of interest in the light of growth and finance. In addition, the effects of economic integration on income inequalities have begun to be examined and especially the negative effects of

economic crisis on inequalities have been the basis of the research topics in literature. With the help of economic integration, on the one hand trade-creation effects can reduce income inequality, but on the other hand trade-diversion effects can deteriorate the income distribution. The bi-directional effects of economic integration on income distribution can be more dominant in times of economic crisis. Therefore, the examination of these relations on the basis of the European Union, which is the largest integration example in the world, increases the importance of the issue. In this context, it is important to examine the effects of the European Union integration and economic crises on income inequalities.

Since its establishment, the expansion of the EU has led to increase in income inequality. Adding Spain and Portugal that joined the Union in 1986 as well as Austria, Finland and Sweden that joined in 1995, increases the Gini index from 0.29 to 0.30. The expansion in 2004 brings about a more significant increase in inequality: adding the Czech Republic, Hungary, Poland, Slovakia and Slovenia increases the Gini to 0.33 in 2008.[11] However, when the *catching-up* economies such as Ireland, Portugal, Spain and the Eastern European countries are excluded from the sample, declining the inequality can be seen. In the context of the Gini index, the regional integration in Europe has been the cause of income inequality. The main point expected from the economic integration is the reduction of income inequality since it enhances the cooperation of the politics of the integrated countries in the context of political, economic and social institutions, human capital and market competitions. In addition, regional integration makes the members to obey the economic rules. For example, the EU asks member countries for providing budgetary discipline and other requirements in the context of Maastricht criteria before joining the currency union. In this context, in order to reduce income inequalities, the member states that will be included in the integration are expected to revise their economic and social characteristics.[12]

However, with the help of the studies done by Western[13], Alderson[14] and Beckfield[15], it can be claimed that the mechanism of economic

[11] Kaja Bonesmo-Fredriksen, "Income Inequality in the European Union", *OECD Economics Department Working Papers*, no 952 (2012): 1-26.

[12] Jason Beckfield, "European Integration and Income Inequality", *American Sociological Review* 71, (2006): 964-985.

[13] Bruce Western, *Between Class and Market: Postwar Unionization in Capitalist Democracies*, (Princeton: Princeton University Press, 1997).

[14] Arthur S. Alderson, "Explaining the Upswing in Direct Investment: A Test of Mainstream and Heterodox Theories of Globalization", *Social Forces* 83, (2004): 81-122.

[15] Beckfield, "European Integration and Income Inequality", 964-985.

integration increases income inequality through enlargement of liberalization and competition of market. Since the movement of economic integration expands market scale which leads to compel labors to competition, the tendency of unity among the labor force, in other words, unionization increases. Such a process coordinates the regulatory attempt and redistributes regulatory costs from tremendously unionized industries to unorganized industries and this cost transfer system creates inequality.[16] In addition, owing to the fact that economic integration increases trade levels, larger worker market and wage competition between workers emerges. As a consequence, the economic integration and trade liberalization are anticipated to raise inequality.[17] Besides, as Beckfield[18] noted, although an economic integration movement in the regional level may increase inequality, the impact may be inverted at higher phases of economic integration. In other words, up to a certain levels of economic integration a positive linkage between integration and inequality can be occurred, but when the threshold levels of integration is passed the nexus turns negative. Moreover, as Obstfeld[19] noted, the financial deepening and integration increases the level of competition, raises stability, enlarges markets and boosts financial intermediaries. Therefore, this eases income inequality with the help of efficient allocation of capital stock. Besides, financial development and integration improve the depth and flexibility of financial services. Such a process provides more resistance to the system of European financial markets. In addition, as Masten *et al*.[20] pointed out, financial integration triggers economic growth by improving the institutional framework and by transferring capital to the areas in which it is scarce and in which profit opportunities are greater and therefore such a mechanism eases inequality by sharing income risk.[21]All these economic mechanisms suggest that the advanced integration levels can reduce income inequality.

---

16 Bruce Western, *Between Class and Market: Postwar Unionization in Capitalist Democracies*, 1997.

17 Arthur S. Alderson and François Nielsen, "Globalization and the Great U-Turn: Income Inequality Trends In 16 OECD Countries", *American Journal of Sociology* 107, (2002): 1244-1299.

18 Beckfield, "European Integration and Income Inequality", 964-985.

19 Maurice Obstfeld, "Risk-Taking, Global Diversification and Growth", *American Economic Review* 84, (1994): 1310-1329.

20 Brezigar A. Masten, Fabrizio Coricelli and Igor Masten, "Non-Linear Effect of Financial Development: Does Financial Integration Matter?" *Journal of International Money and Finance* 27, (2008): 295-313.

21 Annina Kaltenbrunner, Gary A. Dymski and Hanna Szymborska, "Financialization and Inequality: A European Challenge", *Queries* 7, (2015): 34-36.

While advanced integration levels between countries reduce income inequality, countries become more interdependent to each other in financial and economic terms due to integration and it makes them more vulnerable to the effects of crises. Hence, it is possible to claim that the more economic interconnection of countries increases, the more contagion probability of crises raises. Therefore, in addition to the positive effects of financial integration on reducing income inequality, it should be noted that economic crises stemming from the instability of financial markets may increase income inequality. Although the EU-wide GDP has reached to 2007 levels by 2011, the income inequalities have remained its high levels during the recovery period. Inequality level measured as income quintile share ratio (S80/S20) has increased in the post-crisis period. For instance, average inequality level for the EU member countries has risen from 5.0 to 5.2 in period of 2007-2014. Similarly, it has increased from 4.0 to 4.4 in Luxembourg, from 4.9 to 5.1 in Germany, from 3.9 to 4.3 in France, from 4.8 to 4.9 in Ireland, from 6.0 to 6.5 in Greece, from 5.5 to 6.8 in Spain, from 3.7 to 4.3 in Hungary, from 3.9 to 4.0 in Malta, from 5.9 to 6.1 in Lithuania, from 6.4 to 6.5 in Latvia and from 4.4 to 5.4 in Cyprus.[22]

As it can be understood, the more financialization and the more interdependence relations in the context of financial operations among the EU member countries, the more income inequalities appear in the turmoil period of business cycles. In the shadow of the crisis, as noted by Kaltenbrunner *et al*.[23], both the world economy and the EU experienced massive financial costs in the context of bailout payments. The impact of the payments on the economic system was the increase of the tax payments which give rise to income inequality. Besides, the increasing state debts created a downward restraint on the state spending which led to transfer incomes from the bottom to the top of the income distribution level, supporting the idea of trickle-up mechanism. In addition, during the global financial crisis, financial institutions and banks had to reduce or stop lending services, causing sudden stop of the growth levels of economic activities and widening income inequalities in the Europe. All of these processes make the EU more unequal in the context of income distribution and standards of living. Therefore, it is possible to say that the integration of the European Union has been in a structure that affects economic growth and income inequalities since its establishment.

---

[22] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di11&lang=en

[23] Kaltenbrunner, Dymski and Szymborska, "Financialization and Inequality: A European Challenge", 34-36.

Since the European Coal and Steel Community (ECSC) and the European Economic Community (EEC), the origins of the EU, were established, nearly all of the European countries have grown faster and in most cases growth has been faster than any previous period. In the light of a step towards economic integration, the average growth rate of European countries was 4.2 per cent in the period from 1950 to 1960, which was 2.7 per cent in the period of 1870-1913 and 1.9 per cent in the period of 1913-1950. The growth rates in the late fifties and early sixties were still very high in Europe. The average growth rate from 1956 to 1961 was 3.9 per cent.[24] Whereas in the period of 1963-1972 the average growth rate of the ECC was 4.5 per cent, the ECC growth rate slumped to 2.1 per cent in the first enlargement period, 1973-1982. The reason of declining growth rate was to fall of the Bretton Woods system in 1971, together with quadrupling in the price of oil during 1973-1974 and 1978.[25] Therefore, the speed of economic growth of the EU came to an end in the end of 1970s.

In a period when the second, the third and the fourth enlargement have took place, the growth rate of the EU declined and the average growth rate of the EU was about 2.1 percent in the period of 1981-1995. From 1996 to 2003 the average growth rate of the EU increased to 2.5 per cent. Along with the fifth enlargement, the average growth rate of the EU decreased to 2.3 per cent in 2004. In period of 2004-2006 the average growth rate of the EU raised to 2.6 per cent thanks to positive dynamic and scale effects of the enlargement. When Romania and Bulgaria participated in the Union in the context of the sixth enlargement in 2007 the growth rate of the EU raised again to 3.1 per cent. It means that after the enlargement wave the economic performance of the EU has been remarkable. Nearly all countries of the region performed high growth rates; even some of them had double-digit growth rates. In other words, the poorer countries such as Romania and Bulgaria performed high growth rates than the countries that took part in the Union in 2004. However, the Global Financial Crisis of 2008 caused to fall in output level in the Union, especially in the new member states. The growth rates dropped to 0.5 per cent and -4.4 per cent in 2008 and 2009, respectively. The crisis has demonstrated that the EU member countries are not a homogenous group.[26] The average low level of growth remains

[24] Angus Maddison, *Economic Growth in the West: Comparative Experience in Europe and North America*, (Great Britain: Routledge, 2014).

[25] David Gowland and Arthur Turner, *Reluctant Europeans: Britain and European Integration, 1945-1998*, (New York: Routledge, 2014).

[26] Dariusz K. Rosati, "Growth Prospects in the EU-10 Member States after the Crisis". In *Post-Crisis Growth and Integration in Europe*, eds. Ewald Nowotny *et al*. (USA: Edward Elgar, 2011), 45-62.

unchanged as 1.1 per cent in the period 2010-2012. When Croatia joined the Union in 2013, the seventh enlargement wave, the economic growth rate of the EU decreased to 0.2 per cent. Post financial crisis period, European debt crisis penetrated the Union again and the growth rates have been recorded as 1.4 percent and 2 percent in 2014 and 2015, respectively.

There are two important factors why the paper focuses on the case of the EU member countries: Firstly, the availability of the data ensured by World Bank and Eurostat allow this paper to examine the income inequality in the light of growth, finance, integration and crises. Secondly, since the EU member countries are integrated in economic and political aspects, the determination of the reasons of the EU-wide income inequality is crucial. In addition, the world's most efficient supranational entity should be taken into consideration to analyze the effects of the integration on inequality.

II. Literature Review on Growth, Finance and Inequality

Although the case of finance-growth nexus has been widely examined, a few studies have investigated the linkage between finance, growth and inequality. The relationship among the mentioned variables is crucial since both finance and growth can have positive or negative effects upon income inequality. Therefore, it is important to investigate the linkages among them.

The papers examining the linkages between finance, growth and inequality generally point out the importance of development of financial institutions because of its contributing effects on sustainable growth. These kinds of works investigate the effects of finance on the poor by calculating the linkage between finance, growth, income distribution and poverty level. In addition, the mechanisms affecting the poor via financial development are described in the papers, as well. In these works, it is pointed out that aggregate growth levels and changes in the distribution of income can affect the incomes of the poor and the inequality. In general, these papers claim that finance and growth are linked to each other in the bi-directional causality manner and finance and growth affect the distribution of income. The studies done by Honohan[27], Beck *et al*.[28], Caporale *et al*.[29], Odhiambo[30],

[27] Patrick Honohan, "Financial Development, Growth and Poverty: How Close Are the Links?", *World Bank Policy Research Working Paper*, no 3203 (2004): 1-31.

[28] Thorsten Beck, Aslı Demirgüç-Kunt and Ross Levine, "Finance, Inequality and the Poor", *Journal of Economic Growth 12*, (2007): 27-49.

[29] Guglielmo M. Caporale, Christophe Rault, Robert Sova and Anamaria Sova, "Financial Development and Economic Growth: Evidence from Ten New EU Members", *DIW Berlin German Institute for Economic Research Discussion Papers*, no 940 (2009), 1-42.

[30] Nicholas M. Odhiambo, "Finance-Growth-Poverty Nexus in South Africa: A Dynamic Causality Linkage", *The Journal of Socio-Economics* 38, (2009): 320-325.

Pradhan[31], Ang[32], Rewilak[33] and Yüce-Akıncı and Akıncı[34] show that finance improves growth and *vice versa*. Besides, some of the works indicate the inverted-U shaped linkage between finance, growth and inequality and the relationship among mentioned variables are described in the light of the stages of the economic development. The works done by Greenwood and Jovanovic[35], Galor and Moav[36], Jalilian and Kirkpatrick[37], Rehman *et al.*[38], Zhang and Chen[39] and Yüce-Akıncı and Akıncı[40] also indicate that at the first phase of development, finance-growth is linked to inequality positively, however beyond the threshold level of development at the second phase of development, the nexus between finance and growth turns negative. That is to say, the linkage between finance/growth and inequality is quadratic. In contrast, Lundberg and Squire[41] asserting the idea that finance cannot accelerate growth point out that growth and inequality tend to move together positively if they are affected by financial development. In addition, Rehman *et al.*[42] who assert that finance decreases the income inequalities regardless of development phases shed light on the evidence of the existence of inverted-U shaped hypothesis for income growth. The results point out the vitality of the financial development for the poor, also. The studies

---

31 Rudra Pradhan, "The Nexus between Finance, Growth and Poverty in India: The Cointegration and Causality Approach". *Asian Social Science* 6, (2010): 114-122.

32 James B. Ang, "Finance and Inequality: The Case of India", *Southern Economic Journal* 76, (2010): 738-761.

33 Johan Rewilak, "Finance Is Good for the Poor But It Depends Where You Live". *Journal of Banking & Finance* 37, (2013): 1451-1459.

34 Gönül Yüce Akıncı ve Merter Akıncı, "Ters-U Hipotezi Bağlamında Ekonomik Büyüme, Finansal Kalkınma ve Gelir Eşitsizliği Mekanizmaları Üzerine", *Finans Politik ve Ekonomik Yorumlar* 53, no 622, (2016): 61-78.

35 Greenwood and Jovanovic, "Financial Development, Growth and Distribution of Income", 174-189.

36 Oded Galor and Omer Moav, "From Physical to Human Capital Accumulation: Inequality and the Process of Development", *Review of Economic Studies* 71, (2004): 1001–1026.

37 Hossein Jalilian and Colin Kirkpatrick, (2005). "Does Financial Development Contribute to Poverty Reduction?", *The Journal of Development Studies* 41, (2005): 636-656.

38 Hafeez U. Rehman, Sajawal Khan and Imtiaz Ahmed, "Income Distribution, Growth and Financial Development: A Cross Countries Analysis", *Pakistan Economic and Social Review* 46, (2008): 1-16.

39 Quanda Zhang and Rongda Chen, "Financial Development and Income Inequality in China: An Application of SVAR Approach", *Procedia Computer Science* 55, (2015): 774-781.

40 Yüce Akıncı ve Akıncı, "Ters-U Hipotezi Bağlamında Ekonomik Büyüme, Finansal Kalkınma ve Gelir Eşitsizliği Mekanizmaları Üzerine", 61-78.

41 Mattias Lundberg and Lyn Squire, "The Simultaneous Evolution of Growth and Inequality", *The Economic Journal* 113, (2003): 326-344.

42 Rehman, Khan and Ahmed, "Income Distribution, Growth and Financial Development: A Cross Countries Analysis", 1-16.

mentioned above suggest that growth can be considered as the economic policy tool to boost development of financial institutions and growth-finance can be taken into account to reduce poverty level.

The linkages between finance, growth and income inequality have been shaped around two hypotheses: inequality-widening effect of finance and growth and inequality-narrowing effect of finance and growth. In general, inequality-widening hypothesis asserts that only the rich and well-connected may benefit more from growth and financial development when the social quality is weak. On the other hand, inequality-narrowing hypothesis claims that as economic growth boosts and financial sector improves, the poor may gain access to financial services and may benefit from the blessings of growth. However, as well as the studies proving the existence of positive or negative relationships between finance, growth and income inequality, there are also some studies in the economic literature which explain that finance and growth do not have any effect on inequality or poverty. The studies done by Law and Tan[43], Kunieda *et al.*[44], Furceri and Loungani[45], Dhrifi[46] and Akıncı *et al.*[47] assert that development of financial institutions and economic growth have statistically weak and insignificant impact in decreasing inequality. These studies point out the importance of the improvement of financial sector, the quality of growth and institutions in decreasing income inequality.

Although there are a lot of works explaining the determinants of the distribution of income and income inequality in the light of advanced countries, there are only a few studies which take into account the specific factors such as political regional development and economic integration. Considering that regional integration movements are an important factor shaping the world economic system, the possible effects of integration movements on macroeconomic variables will be understood more clearly. Especially, integration movements can affect many economic variables due

---

[43] Siong H. Law and Hui B. Tan, "The Role of Financial Development on Income Inequality in Malaysia", *Journal of Economic Development* 34, (2009): 153-168.

[44] Takuma Kunieda, Keisuke Okada and Akihisa Shibata, "Finance and Inequality: How Does Globalization Change Their Relationship?", *MPRA Paper*, no 35358 (2011): 1-46.

[45] Davide Furceri and Prakash Loungani, "Capital Account Liberalization and Inequality", *IMF Working Paper*, no WP/15/243 (2015): 1-26.

[46] Abdelhafidh Dhrifi, "Financial Development and the 'Growth-Inequality-Poverty' Triangle", *Journal of Knowledge Economy* 6, no 4 (2015): 1163-1176.

[47] Merter Akıncı, Gönül Yüce Akıncı ve Ömer Yılmaz, "Gelir Eşitsizliğini Azaltmada Finansal Sistem Ne Kadar Etkin? Türkiye Ekonomisi Için Bölgesel Panel Veri Analizi [How Effective is Financial System to Reduce Income Inequality: A Regional Panel Data Analysis for Turkish Economy]", *TİSK Akademi* 10, no 20 (2015): 286-316.

to the trade-creation and trade-diversion mechanisms they have created. In this manner, distribution of income is one of the most important factors that are affected by economic integration. The studies investigating the relationship between integration and income inequality have proved the existence of positive and negative connections, as well as U-shaped and inverted-U shaped linkages. In addition, some of the papers develop theories respecting the effects of political progress, regional development and economic integration on inequality. Atkinson *et al.*[48], Milanovic[49], Smeeding[50], Beblo and Knaus[51], Beckfield[52], Brandolini[53], Hoffmeister[54], Cornia[55], Afonso *et al.*[56], Jaumotte *et al.*[57], Busemeyer and Tober[58], and Kuo and Lee[59] find proof that economic integration is connected to inequality positively, negatively or U- and inverted-U shapely.

---

[48] Anthony B. Atkinson, Lee Rainwater and Timothy M. Smeeding, "Income Distribution in OECD Countries: Evidence from the Luxembourg Income Study", *Social Policy Studies* 18, (1995): 1-162.

[49] Branko Milanovic, "Explaining the Increase in Inequality during Transition", *Economics of Transition* 7, (1999): 299-341.

[50] Timothy M. Smeeding, "Changing Income Inequality in OECD Countries: Updated Results from the Luxembourg Income Study (LIS)", In *The Personal Distribution of Income in an International Perspective*, eds. R. Hauser and I. Becker (Berlin: Springer, 2000), 205-224.

[51] Miriam Beblo and Thomas Knaus, "Measuring Income Inequality in Euroland", *Review of Income and Wealth* 47, (2001): 301–320.

[52] Beckfield, "European Integration and Income Inequality", 964-985 and Jason Beckfield. "Remapping Inequality in Europe: The Net Effect of Regional Integration on Total Income Inequality in the European Union", *International Journal of Comparative Sociology* 50, (2009): 486-509.

[53] Aandrea Brandolini, "Measurement of Income Distribution in Supranational Entities: The Case of the European Union", In *Inequality and Poverty Re-examined*, eds. S. P. Jenkins and J. Micklewright (Oxford: Oxford University Press, 2007).

[54] Onno Hoffmeister, "The Spatial Structure of Income Inequality in the Enlarged EU", *Review of Income and Wealth* 55, (2009): 101–127.

[55] Giovanni A. Cornia, "Economic Integration, Inequality and Growth: Latin America versus the European Economies in Transition", *Review of Economics and Institutions* 2, no 2 (2011): 1-31.

[56] Oscar Afonso, Ana L. Albuquerque and Alexandre Almeida, "Wage Inequality Determinants in the European Union", *Applied Economics Letters* 20, (2013): 1170-1173.

[57] Florence Jaumotte, Subir Lall and Chris Papageorgiou, "Rising Income Inequality: Technology, or Trade and Financial Globalization?", *IMF Economic Review* 61, (2013): 271–309.

[58] Marius R. Busemeyer and Tobias Tober, "European Integration and the Political Economy of Inequality", *European Union Politics* 16, no 4 (2015): 536-557.

[59] Kuo H. Kuo and Cheng T. Lee, "Economic Integration, Growth and Income Distribution", *Australian Economic Papers* 56, no 1 (2017): 59-71.

Studies on economic growth, financial development and inequality are more inadequate compared to researches on the growth-finance nexus. Therefore, in order to eliminate the deficiency in the literature about the linkage between growth, finance and inequality, the paper tries to determine the validity of the Kuznets and the Greenwood-Jovanovic Hypothesis using panel simultaneous equation systems. For this purpose, this paper examines the nexus between economic growth and financial development in the context of *demand following* and *supply leading* in the first phase. In the second phase, the study analyzes the validity of whether growth or finance affects inequality in accordance with inverted U-shaped theories. The findings of the paper are similar with the other works done by Jalilian and Kirkpatrick[60], Beckfield[61], Beck *et al.*[62], Rewilak[63] and Yüce-Akıncı and Akıncı[64], suggesting that finance improves growth. The results points out the causality linkages from finance to growth and the linkage between finance and inequality is second-degree, in other words quadratic: at the first phase of development, finance-growth is linked to inequality positively, however beyond the threshold level of development at the second phase of development, the nexus between finance and growth turns negative. In addition, the paper extends the studies done by the Jalilian and Kirkpatrick[65], Beckfield[66], Beck *et al.*[67], Rewilak[68] and Yüce-Akıncı and Akıncı[69] adding some control variables to determine the effects of economic integration on inequality. Then, the paper expects to find the relationship from growth to finance or *vice versa* and to make a statement that finance or growth is good for alleviating inequality, relevant of the phases of development. Additionally, the study tries to introduce a linkage between economic integration level, crises and inequality. Specifically, the studies by Yüce Akıncı *et al*.[70] and Yüce-Akıncı and Akıncı[71] investigate the relationship

---

60 Jalilian and Kirkpatrick, "Does Financial Development Contribute to Poverty Reduction?", 636-656.

61 Beckfield, "European Integration and Income Inequality", 964-985.

62 Beck *et al*. "Finance, Inequality and the Poor", 27-49.

63 Rewilak, "Finance Is Good for the Poor But It Depends Where You Live", 1451-1459.

64 Yüce Akıncı ve Akıncı, "Ters-U Hipotezi Bağlamında Ekonomik Büyüme, Finansal Kalkınma ve Gelir Eşitsizliği Mekanizmaları Üzerine", 61-78.

65 Jalilian and Kirkpatrick, "Does Financial Development Contribute to Poverty Reduction?", 636-656.

66 Beckfield, "European Integration and Income Inequality", 964-985.

67 Beck *et al*. "Finance, Inequality and the Poor", 27-49.

68 Rewilak, "Finance Is Good for the Poor But It Depends Where You Live", 1451-1459.

69 Yüce Akıncı ve Akıncı, "Ters-U Hipotezi Bağlamında Ekonomik Büyüme, Finansal Kalkınma ve Gelir Eşitsizliği Mekanizmaları Üzerine", 61-78.

70 Gönül Yüce Akıncı, Merter Akıncı and Ömer Yılmaz, "Financial Development-Economic Growth Nexus: A Panel Data Analysis upon OECD Countries", *Hitotsubashi Journal of Economics* 55, (2014): 33-50.

between growth, finance and inequality in OECD member countries and Turkey using panel data and TAR/M-TAR analyses. These papers point out the existence of *demand-following hypothesis* in OECD countries and *supply-leading hypothesis* in Turkey. Moreover, the study by Yüce-Akıncı and Akıncı[72] asserts that income inequality declines in parallel with rising economic growth and the Kuznets Inverted-U Hypothesis is valid in Turkish economy. Unlike these studies, first of all we examine the relationships between growth and finance in the EU member countries, and then investigate the links between growth, finance and income inequalities using multiple regression equations. In addition, we extend the study by examining the relationships between mentioned variables not only in the context of the Kuznets Inverted-U Hypothesis but also in the context of the Greenwood-Jovanovic Inverted-U Hypothesis. Furthermore, based on the literature researches, we also analyze the quadratic effect of the world's largest integration movement and the role of financial crises on income.

[71] Yüce Akıncı ve Akıncı, "Ters-U Hipotezi Bağlamında Ekonomik Büyüme, Finansal Kalkınma ve Gelir Eşitsizliği Mekanizmaları Üzerine", 61-78.

[72] Yüce Akıncı ve Akıncı, "Ters-U Hipotezi Bağlamında Ekonomik Büyüme, Finansal Kalkınma ve Gelir Eşitsizliği Mekanizmaları Üzerine", 61-78.

Table 1. Brief Summary of Literature Review

The Author(s)	Country	Period	Method	Variables		Result
Honohan (2004)	76 Countries	1961-2002	Panel Data Analysis	GDP Per-Capita Income Share of Top 10% Income Share of Second 10% Income Share of Lowest 10%	Private Credit Gini Coefficient Inflation Rate Institutions	In these works, it is pointed out that aggregate growth levels and changes in the distribution of income can affect the incomes of the poor and the inequality. In general, these papers claim that finance and growth are linked to each other in the bi-directional causality manner and finance and growth affect the distribution of income. In general, the results of the analysis show that finance improves growth and *vice versa*
Beck *et al.* (2007)	72 Countries	1960-2005	Dynamic Panel Instrumental Variables Regressions and Panel GMM	Private Credit Gini Coefficient Growth of Lowest Income Share Growth of Headcount GDP Per-Capita Growth	Inflation Rate Trade Openness Population Growth Age Dependency Ratio	
Caporale *et al.* (2009)	10 EU Member Countries	1994-2007	Dynamic Panel Model	GDP Per-Capita Growth Initial Per-Capita GDP Investment/GDP Trade/GDP Inflation Rate Government Expenditure/GDP	Secondary School Enrollment Domestic Credit to Private Sector Stock Market Capitalization Liquid Liabilities/GDP Reform Index of Finance Interest Rate Margin	
Odhiambo (2009)	South Africa	1960-2006	Error Correction Model and Cointegration and Granger Causality Analysis	Real Per-Capita Income Financial Development (M2/GDP)	Poverty Reduction Economic Growth	
Pradhan (2010)	India	1951-2008	Johansen Cointegration and Granger Causality Analysis	GDP Per-Capita Growth Broad Money Supply to GDP	The People Below the Poverty Line	
Ang (2010)	India	1951-2004	Error Correction Model and ARDL	GDP Per-Capita Growth Gini Coefficient Inflation Rate Private Credit/GDP Stock Market Capitalization	Trade Openness Financial Liberalization Index (M3-M1)/GDP Banking Density Interest Rate	
Rewilak (2013)	EAP, ECA, LAC, MENA, SA and SSA Countries	1956-2008	System GMM	Income Growth of the Lowest Quintile Private Credit/GDP Liquid Liabilities/GDP Rule of Law Income Share of the Lowest Quintile Commercial Bank Assets	Stock Market Capitalization GDP Per-Capita Growth Trade Openness Inflation Rate Government Consumption	
Yüce-Akıncı and Akıncı (2016)	Turkey	1960-2014	Enders-Siklos Cointegration, TAR/MTAR	GDP Per-Capita Growth M2/GDP	Gini Coefficient	

Table 1. Brief Summary of Literature Review (Continue)

The Author(s)	Country	Period	Method	Variables		Result
Jalilian and Kirkpatrick (2005)	42 Countries	1960-1995	Panel Data Analysis	GDP Per-Capita Growth Gini Coefficient Private Credit/GDP Inflation Rate Income Growth of the Lowest Quintile	GDP Growth Government Expenditures Trade Openness Secondary Schooling	The Results of the analysis indicate that at the first phase of development process, finance-growth is linked to inequality positively, however beyond the threshold level of development at the second phase of development process, the nexus between finance and growth turns negative. That is to say, the linkage between finance/growth and inequality is quadratic.
Rehman *et al.* (2008)	51 Countries	1975-2002	Panel Data Analysis	GDP Per-Capita Growth Gini Coefficient M2/GDP Inflation Rate Population Growth	Trade Openness Unemployment Rate Government Consumption Literacy Rate of Adults	
Zhang and Chen (2015)	China	1978-2013	SVAR	Income Ratio of Rural-Urban Residents Financial Improvement Ratio Financial Efficiency Ratio	Urbanization Rate Financial Expenditures/GDP	
Yüce-Akıncı and Akıncı (2016)	Turkey	1960-2014	Enders-Siklos Cointegration and TAR/MTAR	GDP Per-Capita Growth M2/GDP	Gini Coefficient	
Law and Tan (2009)	Malaysia	1980-2000	ARDL	Gini Coefficient Private Credit/GDP Stock Market Capitalization Total Share Value Traded Institutions	Domestic Credit/GDP Stock Market Capitalization GDP Per-Capita Inflation Rate	The results of the analysis indicate that finance and growth do not have any effect on inequality or poverty. In other words, these papers assert that development of financial institutions and economic growth has statistically weak and insignificant impact in decreasing inequality. These studies point out the importance of the improvement of financial sector, the quality of growth and institutions in decreasing income inequality
Kunieda *et al.* (2011)	119 Countries	1985-2009	Dynamic Panel Data Analysis	Gini Coefficient Private Credit/GDP GDP Per-Capita Growth Inflation Rate Capital Controls	Schooling Rate Democracy Political Risk Total Net Liabilities Financial Openness	
Furceri and Loungani (2015)	149 Countries	1970-2010	Dynamic Panel Data Analysis	Gini Coefficient Capital Account Liberalization Private Credit/GDP	Regulation Reform Current Account Reform Income Share Groups	
Dhrifi (2015)	89 Countries	1990-2011	Simultaneous Equation System	GDP Per-Capita Growth Theil Index Infrastructure Government Spending Institutions	Population Growth Trade Openness Inflation Rate Human Capital Domestic Credit/GDP	
Akıncı *et al.* (2015)	Turkey	2006-2012	Panel Data Analysis	Private Credit/GDP Gini Coefficient Income Share of Top 20% Income Share of Lowest 20% Employment Financial Liberalization	Human Development Index GDP Per-Capita Savings Per-Capita Population Inflation Rate Tax Revenue	

Table 1. Brief Summary of Literature Review (Continue)

The Author(s)	Country	Period	Method	Variables		Result
Atkinson *et al.* (1995)	17 OECD Countries	1981-1988	Time Series Analysis	Disposable Income Per-Adult Income Distribution Share	International Trade Level Gini Coefficient	The studies investigating the relationship between economic integration, political progress, regional development and income inequality have proved the existence of positive and negative connections, as well as U-shaped and inverted-U shaped linkages. The results of the analysis indicate that economic integration is connected to inequality positively, negatively or U- and inverted-U shapely.
Smeeding (2000)	21 OECD Countries	1980-1997	Time Series Analysis	Income Distribution Share Disposable Income Per-Adult	Gini Coefficient International Trade Level	
Beblo and Knaus (2001)	Euroland Countries	1995-wave of the EC	Cross-Section Analysis	Theil Inequality Index Income Distribution Share Economic Integration	Annual Mean Income Social Transfer Payments	
Beckfield (2006)	12 Western European Countries	1973-1997	REM and FEM Analysis	Regional Integration Gini Coefficient Political Integration Outflow of Foreign Direct Investment	Intraregional Trade Share Real GDP Per-Capita Social Security Transfer	
Brandolini (2007)	25 EU Member Countries	2000	Cross-Section Analysis	GNI Gross-Disposable Income Gini Coefficient	Head-Count Poverty Ratios European Integration Level	
Hoffmeister (2009)	25 EU Member Countries	1995-2000	Three Level of Spatial Decomposition	Mean Logarithmic Deviation Population Share Economic Integration Level	Equivalized Disposable Income Growth of Per-Capita Income	
Beckfield (2009)	17 Western European Countries	1950-1998	Time Series and Panel Data Analysis	Gini Coefficient Exports To EU/Total Export Economic Integration FDI Outflow	Real GDP Per-Capita Political Integration Social Security Transfers	
Cornia (2011)	CE, SEE, EEC, CA, CAC and SA Countries	1980-2008	Time Series Analysis	Gini Coefficient GDP Growth Wages Current Account Deficit Population Rate	Gross-Enrolment Rate Tax Rate FDI/GDP Flows Political Orientation Economic Integration Level	
Afonso *et al.* (2013)	OECD and non-OECD Countries	1981-2007	Panel Data Analysis	Real GDP Growth Government Spending GDP Inflation Rate Election Date	Financial Crisis Government Revenue Budget Balance Ratio Government Debt	
Jaumotte *et al.* (2013)	51 Countries	1981-2003	Panel Data Analysis	Gini Coefficient Trade Openness Financial Globalization Employment Rate Technology	Capital Stock Private Credit/GDP Education FDI Flows Economic Integration Level	

Table 1. Brief Summary of Literature Review (Continue)

The Author(s)	Country	Period	Method	Variables	Result
Busemeyer and Tober (2015)	14 EU Member Countries	1999-2010	FEM Analysis	Gini Coefficient Economic Integration Level Trade Openness GDP Growth Education Tax Rate Political Integration Unemployment Rate Social Transfers	The results of the analysis indicate that economic integration is connected to inequality positively, negatively or U- and inverted-U shapely.
Kuo and Lee (2017)	A Developing Country and A Developed Country	-	Two Sector Growth Model	Income Distribution Economic Integration Level Economic Growth	

III. Data Set, Model and Methodology

In the paper, to analyze the nexus between growth, finance and inequality the panel system Two-Stage Least Squares (2SLS) is applied. To test the nexus among the variables in 28 member countries of the EU, the annual time series for the period 1995-2018 is taken into consideration and Eviews 9.0 software program is used to carry out the estimations.

To determine the financial development the various kinds of proxy including the ratio of broad measure of money to GDP, the ratio of total deposits to GDP, the ratio of financial savings to the GDP and financial development index are used in literature. However, in this study, to measure financial market development the domestic credits to private sector (DC) by banks as a percentage of GDP are used. Clarke *et al.*[73] indicates that this variable is a better proxy for measuring the development of financial markets. Following the works done by Clarke *et al.*[74], Beck *et al.*[75], Ang[76], Yüce Akıncı *et al.*[77] and Park and Shin[78], the variable of DC is taken into account for the proxy of financial development. The annual percentage change of per-capita GDP in constant prices (PCGDP) is used as a proxy for economic growth. Besides, the level of income inequality (INEQ) is considered as the ratio of total income received by the 20% of the population with the highest income to that received by the 20% of the population with the lowest income (P80/P20). In addition, following Beckfield[79], this paper tries to examine the impacts of the economic integration (EI) of the EU and financial/economic crises on income inequality. The export level of a member country going to the other EU member countries as a percentage is taken into account as a proxy for the economic integration. In the context of the measurement, it can be asserted that the integration level rises if countries trade volume within the union raise as a proportion of their total trade. Furthermore, following Afonso *et al.*[80], this paper estimates the effects of economic/financial crisis (EFC) on income inequality using a dummy variable, stating the case of the economy, "crisis" or "normal". To this end,

---

[73] George R. G. Clarke, Lixin C. Xu and Heng-Fu Zou, "Finance and Income Inequality: What Do the Data Tell Us?", *Southern Economic Journal* 72, (2006): 578-596.
[74] Clarke *et al*. "Finance and Income Inequality: What Do the Data Tell Us?", 578-596.
[75] Beck *et al*. "Finance, Inequality and the Poor", 27-49.
[76] Ang, "Finance and Inequality: The Case of India", 738-761.
[77] Yüce Akıncı *et al.*, "Financial Development-Economic Growth Nexus: A Panel Data Analysis upon OECD Countries", 33-50.
[78] Donghyun Park and Kwanho Shin, "Economic Growth, Financial Development and Income Inequality", *ADB Economics Working Paper Series*, no 441 (2015): 1-31.
[79] Beckfield, "European Integration and Income Inequality", 964-985.
[80] Afonso *et al*., "Wage Inequality Determinants in the European Union", 1170-1173.

EFC is measured as a variable which takes "1" if a financial/economic crisis occurs and takes "0" in other situation. The data set are available at the official websites of the World Bank-World Development Indicators and Eurostat.

First of all, the paper tries to detect the linkages between growth and finance on the axis of demand following and supply leading. Secondly, this work analyzes if growth or finance affects income inequality in accordance with inverted U-shaped hypothesis. Therefore, our hypotheses can be tested using two regression equations. If demand following hypothesis is valid $(\beta_1 > 0)$, it will be presumed that finance will have an impact on inequality and the equation systems will be described in the context of the Greenwood-Jovanovic hypothesis as,

$$\begin{aligned} DC_{it} &= \beta_0 + \beta_1 PCGDP_{it} + e_{1it} \\ INEQ_{it} &= \alpha_0 + \alpha_1 DC_{it} + \alpha_2 \left(DC\right)_{it}^2 + e_{2it} \end{aligned} \tag{1}$$

In addition, if supply leading hypothesis is valid $(\psi_1 > 0)$, it will be presumed that growth will have an impact on income inequality and the equation systems will be described in the context of the Kuznets hypothesis as,

$$\begin{aligned} PCGDP_{it} &= \psi_0 + \psi_1 DC_{it} + e_{1it} \\ INEQ_{it} &= \xi_0 + \xi_1 PCGDP_{it} + \xi_2 \left(PCGDP\right)_{it}^2 + e_{2it} \end{aligned} \tag{2}$$

The validity of the Greenwood-Jovanovic hypothesis is said, if α_1 and α_2 has a statistically significant positive and negative sign, respectively. Similarly, the existence of the Kuznets hypothesis is said, if ξ_1 and ξ_2 has a statistically significant positive and negative sign, respectively.

To test the effects of the enlargement of the EU and financial/economic crises on income inequality, the equations numbered (1) and (2) can be rewritten as follows:

$$\begin{aligned} DC_{it} &= \beta_0 + \beta_1 PCGDP_{it} + e_{1it} \\ INEQ_{it} &= \alpha_0 + \alpha_1 DC_{it} + \alpha_2 \left(DC\right)_{it}^2 + \alpha_3 EI_{it} + \alpha_4 \left(EI\right)_{it}^2 + \alpha_5 EFC_{it} + e_{2it} \end{aligned} \tag{3}$$

$$\begin{aligned} PCGDP_{it} &= \psi_0 + \psi_1 DC_{it} + e_{1it} \\ INEQ_{it} &= \xi_0 + \xi_1 PCGDP_{it} + \xi_2 \left(PCGDP\right)_{it}^2 + \xi_3 EI_{it} + \xi_4 \left(EI\right)_{it}^2 + \xi_5 EFC_{it} + e_{2it} \end{aligned} \tag{4}$$

When demand following hypothesis is emerged $(\beta_1 > 0)$, it will be presumed that finance will have an impact on inequality. Besides, to determine the quadratic impacts of the integration on inequality, the coefficients of α_3 and α_4 are anticipated to have a statistically significant positive and negative signs, respectively. In addition, the impacts of the crises on inequality can be examined in the context of the sign of the coefficient of α_5. Similar expectations can be noted in the case of the validity of supply leading hypothesis $(\psi_1 > 0)$.

A system of simultaneous equation is an equations group including uncertain parameters. Systems are predicted using some multivariable analysis which regards the interdependencies between the equations. A panel system is introduced in a general form as,

$$f\left(y_{it}, x_{it}, \beta\right) = \varepsilon_{it} \tag{5}$$

where y_{it} and x_{it} are the vector of endogenous and exogenous variables, respectively. ε_{it} represents the white noise error term, a vector disturbances that are correlated serially. The objective of forecasting process is to calculate the vector of parameters β.

2SLS, which is an extended version of the general OLS method, is an analysis of single equation estimation which is appropriate in which some variables are endogenous. In addition, 2SLS analysis is an analysis that is appropriate in the estimation of structural equations. 2SLS is generally applied if the error terms of the dependent variable are correlated with the independent variables. Besides, if there are feedback cycles in the econometric model it is suitable to perform 2SLS. Moreover, any distributional assumptions are required for applying 2SLS method and it is isolated from specification errors. In addition, 2SLS ensures coactions impacts among regression equations. As Bollen[81] asserted, 2SLS analysis can provide robust findings in small samples. Furthermore, as Beedles[82] noted, if the variables used in a regression model have multiple objectives and they can be endogenous to each other, 2SLS estimation technique should be superior to any other estimation analysis. Since the main regression equations of the paper (numbered from 1 to 4) are exactly identified, 2SLS

[81] Kenneth A. Bollen, "An Alternative Two Stage Least Squares (2SLS) Estimator for Latent Variable Equations", *Psychometrika* 61, (1996): 109-121.

[82] William L. Beedles, "A Micro-Econometric Investigation of Multi-Objective Firms", *The Journal of Finance* 32, no 4 (1977): 1217-1233.

method is useful to apply. Besides, the main regression equations of the paper are deterministic, in other words they are not probabilistic, 2SLS analysis is much more suitable relative to other analysis techniques such as GMM. In addition, while 2SLS take only the lagged levels into account as instrumental variables, GMM analysis use the whole exogenous, lagged differences and lagged levels as instrumental variables. Therefore, it can be more suitable to perform 2SLS method to estimate the equations numbered from (1) to (4). Write the *j*-th equation of the system as,

$$Y\Gamma_{ij} + XB_{ij} + \varepsilon_{ij} = 0 \tag{6}$$

or, alternatively:

$$y_{ij} = Y_{ij}\gamma_{ij} + X_{ij}\beta_{ij} + \varepsilon_{ij} = Z_{ij}\delta_{ij} + \varepsilon_{ij} \tag{7}$$

where $\Gamma'_{ij} = \left(-1, \gamma'_{ij}, 0\right)$, $B'_{ij} = \left(\beta'_{ij}, 0\right)$, $Z'_{ij} = \left(Y'_{ij}, X'_{ij}\right)$ and $\delta'_{ij} = \left(\gamma'_{ij}, \beta'_{ij}\right)$. Y and X are the matrix of endogenous and exogenous variables, respectively and Y_{ij} is the matrix of endogenous variables not including y_{ij}. Firstly, the right-hand side endogenous variables y_{ij} are regressed on all exogenous variables *X* and it is get the fitted values:

$$\hat{Y}_{ij} = X\left(X'X\right)^{-1} X'Y_{ij} \tag{8}$$

Secondly, y_{ij} is regressed on $\hat{Y}_{ij}$ and X_{ij} to obtain:

$$\hat{\delta}_{2SLS} = \left(\hat{Z}'_{ij}\hat{Z}_{ij}\right)^{-1} \hat{Z}'_{ij}y \tag{9}$$

where $\hat{Z}_{ij} = \left(\hat{Y}_{ij}, X_{ij}\right)$. The residuals from an equation using the coefficients are taken into account for form weights.

As well as the examination of the validity of Kuznets and Greenwood-Jovanovic inverted-U shaped hypotheses, this study tries to prove whether financial development and economic growth have a threshold level on income inequality. The methodology developed by Hansen[83], Caner and Hansen[84] and Kremer *et al.*[85] are used to estimate the threshold level of

[83] Bruce E. Hansen, "Threshold Effects in Non-Dynamic Panels: Estimation, Testing, and Inference", *Journal of Econometrics* 93, no 2 (1999): 345-368.

[84] Mehmet Caner and Bruce E. Hansen, "Instrumental Variable Estimation of a Threshold Model", *Econometric Theory* 20, (2004): 813-843.

finance and growth. In this context, a general form of panel threshold model can be defined as the authors mentioned above as follows:

$$y_{it} = \mu_i + \beta_1' z_{it} I\left(q_{it} \le \gamma\right) + \beta_2' z_{it} I\left(q_{it} > \gamma\right) + \varepsilon_{it} \qquad (10)$$

where i $\left(i = 1,...,N\right)$ shows the country and t $\left(t = 1,...,T\right)$ represent the time. y_{it} indicates the dependent variable, μ_i is based on the country-specific fixed effect and ε_{it} is the error term. The indicator function, $I\left(.\right)$, presents the regime behaviors represented by the threshold variable of q_{it}. γ indicates the threshold level and z_{it} consists of a set of independent variables that is based on *m*-dimensional vector. It is also possible that the explanatory variables can contain lagged values of the dependent regressor.

The first step of the estimation method is to dispose of the country-specific effects, μ_i, by means of a fixed effect transformation procedure. For this purpose, this study uses the forwards orthogonal deviations transformation introduced by Kremer *et al.*[86] and Arellano and Bover[87] to dispose of the country-specific fixed effects. The forward orthogonal deviations transformation can be calculated using the following equation numbered (11):

$$\varepsilon_{it}^{*} = \sqrt{\frac{T-t}{T-t+1}\left[\varepsilon_{it} - \frac{1}{T-t}\left(\varepsilon_{i(t+1)} + ... + \varepsilon_{iT}\right)\right]} \qquad (11)$$

As Kremer *et al.*[88] noted, the striking feature of the transformation process is that serial correlation of the transformed error terms must be avoided.

The second step of the estimation procedure is to perform 2SLS method to determine the finance and growth threshold level. Following Caner and

---

[85] Stephanie Kremer, Alexander Bick and Dieter Nautz, "Inflation and Growth: New Evidence from a Dynamic Panel Threshold Analysis", *Empirical Economics* 44, no 2 (2013): 861-878.

[86] Kremer *et al.*, "Inflation and Growth: New Evidence from a Dynamic Panel Threshold Analysis", 861-878.

[87] Manuel Arellano and Olympia Bover, (1995), "Another Look at the Instrumental Variables Estimation of Error-Components Models", *Journal of Econometrics* 68, no 1 (1995): 29-51.

[88] Kremer *et al.*, "Inflation and Growth: New Evidence from a Dynamic Panel Threshold Analysis", 861-878.

Hansen[89] and Kremer *et al.*[90], a reduced form of the regression for the independent variables of z_{it} as a function of the instrumental variants of x_{it} is estimated in the first phase. Then, the estimated values of independent variables of $\hat{z}_{it}$ are substituted in the structural model for the independent variables of z_{it}. In the second phase, by using predicted values of independent variables of $\hat{z}_{it}$, the regression equation numbered (1) is estimated with the help of Ordinary Least Squares method for a fixed threshold level of γ. Following Caner and Hansen and Kremer *et al.* $S(\gamma)$ can be defined as the sum of the squared residuals of least squares and this procedure is repeated until finding a suitable threshold value of γ that has the smallest sum of squared residuals. In other words, γ is called the threshold estimator that minimizes the sum of squared error terms:

$$\hat{\gamma} = \arg\min S(\gamma) \tag{12}$$

In order to determine the critical values for finance and growth threshold, the 95% confidence interval needs to be computed. Hansen, Caner and Hansen and Kremer *et al.* suggest a constraint process which should be applied to find the optimal confidence values:

$$\Gamma = \{\gamma : LR(\gamma) \leq C(\alpha)\} \tag{13}$$

where, $LR(\gamma)$ is the asymptotic distribution of the likelihood ratio and $C(\alpha)$ is the 95% percentile concerning the distribution.

Following Bick[91] and Kremer *et al.*[92], initial levels of finance, growth and inequality are considered as the endogenous regressors. Besides, in accordance with Arellano and Bover[93], we take into account all lags of the dependent variable as instrumental variables to reach the optimal findings.

---

[89] Caner and Hansen, "Instrumental Variable Estimation of a Threshold Model", 813-843.

[90] Kremer *et al.*, "Inflation and Growth: New Evidence from a Dynamic Panel Threshold Analysis", 861-878.

[91] Alexander Bick, "Thresholds Effects of Inflation on Economic Growth in Developing Countries", *Economics Letters* 108, no 2 (2010): 126-129.

[92] Kremer *et al.*, "Inflation and Growth: New Evidence from a Dynamic Panel Threshold Analysis", 861-878.

[93] Arellano and Bover, (1995), "Another Look at the Instrumental Variables Estimation of Error-Components Models", 29-51.

IV. Results of the Econometric Analysis

Table 2 indicates descriptive statistics and correlation linkages from 1995 to 2018. As it can be seen in Table 2, growth is positively and significantly connected with financial development. Besides, both economic growth and financial development are positively and significantly correlated with inequality. Additionally, the economic integration is positively and significantly correlated with inequality, also. For this reason, it can be observed a positive impact of integration on inequality in the estimation results. However, it should be more important whether income inequality declines with raising level of integration. In other words, we wish to estimate if there is a threshold point for economic integration as well as growth and financial development.

Table 2. Descriptive Statistics and Correlation Coefficients

Panel A: descriptive statistics					
Variable	**Obs**	**Mean**	**Std. Dev**	**Min**	**Max**
GDP per-capita growth	672	2.388	1.745	-16.589	13.267
Domestic credits	672	88.294	54.453	7.115	304.951
Income inequality	672	4.626	1.100	2.900	7.800
Economic integration	672	62.115	29.880	38.217	83.421

Panel B: correlation coefficients					
		GDP per-capita growth	Domestic credits	Income inequality	Economic integration
GDP per-capita growth	*Correlation*	1.000			
	t-Stat	-			
	Probability	-			
Domestic credits	*Correlation*	0.783***	1.000		
	t-Stat	5.088	-		
	Probability	0.000	-		
Income inequality	*Correlation*	0.753***	0.606**	1.000	
	t-Stat	3.002	2.465	-	
	Probability	0.000	0.014	-	
Economic integration	*Correlation*	0.691***	0.115	0.824***	1.000
	t-Stat	3.550	1.051	3.217	-
	Probability	0.000	0.759	0.000	-

Note: *** and ** indicate significance at 1% and 5%, respectively.

In this part of the paper, the redundant fixed (F) and the correlated random (LM) tests are applied to determine the structure of the panel. The findings of the analyses are shown in Table 3. The results of the tests indicate the existence of different optimum models for various regression models.

Table 3. The Results of F and LM Tests

Model	*F* Test		*LM* Test		Hausman Test (Prob)	Optimum Model
	Test	Statistic	Test	Statistic		
1	*FCross-Section*	1.036	*LMCross-Section*	0.072	1.867** (0.044)	*FP*
	FPeriod	2.152**	*LMPeriod*	0.424		
	FCS/P	1.339	*LMCS/P*	2.627**		
2	*FCross-Section*	1.442	*LMCross-Section*	3.766***	3.742*** (0.000)	*FCS/P*
	FPeriod	2.883***	*LMPeriod*	1.787*		
	FCS/P	1.730*	*LMCS/P*	2.519**		
3	*FCross-Section*	1.662	*LMCross-Section*	0.152	1.530 (0.244)	*LMCS/P*
	FPeriod	2.338**	*LMPeriod*	2.773***		
	FCS/P	1.454	*LMCS/P*	2.462**		
4	*FCross-Section*	0.226	*LMCross-Section*	0.376	2.014* (0.071)	*FCS/P*
	FPeriod	2.544**	*LMPeriod*	1.116		
	FCS/P	3.981***	*LMCS/P*	3.553***		

Note: *, ** and *** indicate the significance at 10%, 5% and 1% significance level, respectively.

Table 4 presents the findings of the regression estimations of the equations numbered (1) and (2). First of all, the main point is to investigate the nexus between economic growth and financial development in the context of demand following and supply leading. Secondly, the impacts of growth and finance on inequality in accordance with the Kuznets and the Greenwood-Jovanovic inverted U-shaped hypothesis are estimated. The findings are presented in Table 4.

Table 4. The Results of the Panel System Two-Stage Least Squares

Panel A: The Greenwood-Jovanovic Hypothesis [Regression Model Numbered (1)]			
Variable	**Coefficient**	***t*-Statistics**	**Probability**
β_0(Constant)	3.148***	4.072	0.000
β_1(GDP Per-Capita Growth)	4.634***	3.853	0.000
α_0(Constant)	3.299	1.578	0.114
α_1(Domestic Credits)	0.321**	2.639	0.037
α_2(Domestic Credits)^2	-0.141**	-2.641	0.035
Instrumental variables			
Constant (C)	PCGDP(-1)	DC(-1)	INEQ(-1)
Statistics of the model			
R^2: 0.631	**F:** 3.011***	**Prob(F):** 0.001	**DW:** 1.916
VIF: 3.553	$\chi^2_{BG}(2)$: 0.553 (0.471)	χ^2_{BPG}: 3.775 (0.141)	**Optimum Model:** F_P
JB: 9.628 (0.223)	**Country Effect:** No	**Time Effect:** Yes	
Estimated Threshold Level Year: 2007		**Estimated Threshold Level Domestic Credit Level (% of GDP):** 108.45%	
Panel B: The Kuznets Hypothesis [Regression Model Numbered (2)]			
Variable	**Coefficient**	***t*-Statistics**	**Probability**
ψ_0(Constant)	5.041***	3.998	0.000
ψ_1(Domestic Credits)	0.030**	2.455	0.027
ζ_0(Constant)	3.553*	1.963	0.075
ζ_1(GDP Per-Capita Growth)	0.737***	3.091	0.002
ζ_2(GDP Per-Capita Growth)^2	0.143**	2.398	0.018
Instrumental Variables			
Constant (C)	PCGDP(-1)	DC(-1)	INEQ(-1)
Statistics of the Model			
R^2: 0.584	**F:** 3.547***	**Prob(F):** 0.000	**DW:** 2.047
VIF: 3.772	$\chi^2_{BG}(1)$: 0.668 (0.296)	χ^2_{BPG}: 2.884 (0.158)	**Optimum Model:** $F_{CS/P}$
JB: 7.881 (0.336)	**Country Effect:** Yes	**Time Effect:** Yes	
Estimated Threshold Level Year: 2005		**Estimated Threshold Level Per-Capita GDP Growth Rate:** 3.613%	

Note: ***, ** and * indicate the significance at 1%, 5% and 10%, respectively. Values in parenthesis show the optimum lag lengths which are determined by taking AIC and SIC into consideration.

Table 4 points out that the linkage between growth and finance are in congruity, implying that growth enhances financial development and *vice versa*. Since the coefficients of GDP per-capita growth (4.634) and domestic

credits (0.030) are positive and statistically significant, the existence of both demand following and supply leading hypotheses can be noted. Nonetheless, it is possible to argue that demand following is more dominant than supply leading, because of the significance level of the coefficients. Additionally, this paper expands the analysis in the nexus of growth, finance and inequality. The findings confirm the Greenwood-Jovanovic inverted U-shaped hypothesis. In other words, as Jalilian and Kirkpatrick noted earlier, the linkage between finance and inequality is quadratic, because of significantly positive and negative coefficients of domestic credit (0.321) and square domestic credits (-0.141), respectively. In the early phase of development, the financial development is to be positively related to income inequality, however beyond the threshold level (108.45% of GDP) of financial development the relationship between finance and inequality turns negative. On the other hand, the results presented in Table 4 point out that the linkage between growth and inequality does not display a quadratic form, which is contrary to the Kuznets hypothesis. Therefore, according to the econometric results it is possible to say the invalidity of Kuznets hypothesis. In other words, as the EU member countries develop in the early stage of growth, inequality worsens. But when the threshold level (3.613%) of economic growth is achieved, income inequality continues to deteriorate, suggesting that the linkage between growth and inequality remains positive. Correspondingly, it is possible to say that the results do not confirm the Kuznets inverted U-shaped hypothesis, because of the unexpected sign of the variable squared GDP per-capita growth (0.143).

Table 5. The Results of the Panel System Two-Stage Least Squares

Panel A: The Greenwood-Jovanovic Hypothesis [Regression Model Numbered (3)]			
Variable	**Coefficient**	***t*-Statistics**	**Probability**
β_0(Constant)	3.259***	4.183	0.000
β_1(GDP Per-Capita Growth)	4.745***	3.962	0.000
α_0(Constant)	2.485	1.305	0.426
α_1(Domestic Credits)	0.394**	2.587	0.043
α_2(Domestic Credits)^2	-0.106**	-2.572	0.047
α_3(Economic Integration)	0.328**	2.612	0.038
α_4(Economic Integration)^2	-0.098*	-1.990	0.071
α_5(Economic/Financial Crises)	0.453***	3.772	0.005
Instrumental Variable			
Constant (C)	PCGDP(-1)	DC(-1)	INEQ(-1)
Statistics of the Model			
R^2: 0.674	**F:** 3.226***	**Prob(F):** 0.000	**DW:** 2.027
VIF: 3.912	$\chi^2_{BG}(2)$: 0.776 (0.243)	χ^2_{BPG}: 4.017 (0.119)	**Optimum Model:** $LM_{CS/P}$
JB: 8.703 (0.193)	**Country Effect:** Yes	**Time Effect:** Yes	
Estimated Threshold Level Year: 2010		**Estimated Threshold Level Domestic Credit Level (% of GDP):** 111.76%	
Panel B: The Kuznets Hypothesis [Regression Model Numbered (4)]			
Variable	**Coefficient**	***t*-Statistics**	**Probability**
ψ_0(Constant)	4.922***	3.746	0.000
ψ_1(Domestic Credits)	0.134**	2.660	0.027
ζ_0(Constant)	2.946**	1.876	0.084
ζ_1(GDP Per-Capita Growth)	0.817***	3.127	0.000
ζ_2(GDP Per-Capita Growth)^2	0.158**	2.453	0.011
ζ_3(Economic Integration)	0.424**	2.360	0.042
ζ_4(Economic Integration)^2	-0.077*	-1.883	0.091
ζ_5(Economic/Financial Crises)	0.552**	2.290	0.047
Instrumental Variable			
Constant (C)	PCGDP(-1)	DC(-1)	INEQ(-1)
Statistics of the Model			
R^2: 0.605	**F:** 3.626***	**Prob(F):** 0.000	**DW:** 2.007
VIF: 3.887	$\chi^2_{BG}(2)$: 0.668 (0.301)	χ^2_{BPG}: 3.747 (0.211)	**Optimum Model:** $F_{CS/P}$
JB: 6.115 (0.395)	**Country Effect:** Yes	**Time Effect:** Yes	
Estimated Threshold Level Year: 2006		**Estimated Threshold Level Per-Capita GDP Growth Rate:** 3.672%	

Note: ***, ** and * indicate the significance at 1%, 5% and 10%, respectively. Values in parenthesis show the optimum lag lengths which are determined by taking AIC and SIC into consideration.

In addition, this paper improves the analysis by adding some control variables into model in order to examine the impacts of economic integration and crises on inequality. Table 5 pointing out the similar findings with the Table 4 indicates that robust results have been observed. That is to say, since positive and statistically significant coefficients of GDP per-capita growth (4.745) and domestic credits (0.134) are found, it can clearly be said the existence of both demand following and supply leading hypothesis. Moreover, the domination of demand following phenomenon over supply leading can be noted. Besides, the findings confirm the Greenwood-Jovanovic inverted U-shaped hypothesis once more. In other words, the nexus between finance and inequality is quadratic, because of significantly positive and negative coefficients of domestic credit (0.394) and square domestic credits (-0.106), respectively. In the early phase of development, financial improvement is to be positively related to income inequality, however beyond the threshold level (111.76% of GDP) of finance is obtained, the nexus between finance and inequality becomes negative. Besides, the results do not report any evidences confirming the Kuznets Hypothesis. Therefore, the results presented in Table 5 show that the nexus between growth and inequality does not display a quadratic form (because of positive and significant coefficients of GDP per-capita growth and square GDP per-capita growth, 0.817 and 0.158, respectively) which is contrary to the Kuznets hypothesis. In other words, as the EU member countries develop in the early stage of growth, inequality worsens. But when a threshold level (3.672%) of economic growth is achieved, income inequality continues to deteriorate (because of positive and significant coefficient of square GDP per-capita level, 0.158) suggesting that the linkage between growth and inequality remains positive. Correspondingly, it is possible to say that the results do not confirm the Kuznets inverted U-shaped hypothesis, because of the unexpected sign of the variable squared GDP per-capita growth (0.158).

Furthermore, it is observed a quadratic linkage between economic integration and inequality in both panel A and panel B. In panel A, it can clearly be noted that the economic integration raises income inequality (due to positive and statistically significant coefficient of economic integration, 0.328) up to the threshold level, but inequality begins to decrease at high levels of integration (due to negative and statistically significant coefficient of economic integration, -0.098). Therefore, it can be noted that at the lower level of integration inequality deteriorates, however at the higher level of integration inequality decreases. Besides, the existence of an economic/financial crisis also increases inequality, owing to positive and

significantly coefficient of economic/financial crises, 0.453. Similar results can be observed in panel B.

Conclusion

The motivation of the paper is to examine the linkages between growth, finance and inequality using annual data from the EU member countries in the period of 1995-2018. Specifically, the paper introduces an econometric-based support to respond the policy questions of whether the hypotheses of *demand following* and *supply leading* are valid and of whether both finance and growth can contribute to the aim of inequality reduction in the EU member countries. Besides, the paper investigates the impacts of economic integration and the economic/financial crises on inequality. On the other hand, the question of whether the Kuznets and Greenwood-Jovanovic inverted-U shaped hypotheses are valid in the context of income inequality is also examined. In this context, it is investigated whether financial development and economic growth have a threshold level on income inequality using dynamic panel threshold estimation analysis.

The results of the relationship between growth and finance point out that economic growth and financial development are in harmony, implying that growth supports finance and *vice versa*. Therefore, the validity of both demand following and supply leading phenomenon may be noted. Nevertheless, the dominance of demand following compared to supply leading is observed. Besides, the analysis reflects more findings by attempting to examine the linkage between growth, finance and inequality. The results confirm the Greenwood-Jovanovic inverted U-shaped hypothesis, suggesting that finance is to be positively related to inequality in the early phase of development, but after achieving a threshold level of finance, the linkage between the two turns negative. The results, however, cannot support the Kuznets hypothesis. As the EU member countries develop, income inequality worsens, but when the threshold level of economic growth is achieved, income inequality continues to deteriorate, suggesting that the linkage between growth and inequality remains positive.

Higher level of financial sector improvement and financial development level in member states of the European Union can be considered as an important factor that accelerates economic growth and reduces income inequality. Financial services, which are the fundamental sector in the distribution of resources and funds to rich and poor classes, can accelerate the economic development of the union members. Applying the common financial policies of the Union members can increase growth dynamics on the one hand and decrease income inequalities on the other hand. In this

context, the existence of regulated financial markets rather than deregulated financial markets, which may lead to financial instability, may be effective in increasing the welfare and ensuring social justice of the union. When the results of the analysis are evaluated as a whole, it can be said that the member states of the European Union should focus on the quality of growth rather than just economic growth. An economic policy that can share the benefits of economic growth equally and therefore aim to eliminate the ruthless growth process will gain importance in the context of reducing income inequality. In this context, the growth process that increases the gains of the capitalist class against the gains of the working class will always cause inequality. Economic policies, which consider the labor class as the driving force that manages the economy, eliminate the flexing labor markets, and evaluate labor as a manager of technology rather than as part of technology, can also provide social and economic justice. On the other hand, as the European Union countries have developed financial markets, the effective distribution of capital is relatively successful. While the effective distribution of capital accelerates the economic growth process on the one hand, it also provides the necessary financing opportunities to the poor class. Particularly in the advanced stages of the development process, the participation of many classes of the society in the financial markets ensures that the profits that can be obtained from the financial markets are directed to a large part of the population. In this context, parallel to the acceleration of the financial development process, income inequalities are likely to have decreased in the European Union countries. Therefore, the EU member countries should take precaution for increasing regulated finance-intensive growth that brings about effective allocation of funds and creates income transfer system from rich to poor.

In addition, the main suggestion of the paper is that the economic integration is an important part for decreasing inequality. Due to heterogeneity bias in the context of inequality in the EU, it may be claimed that the higher the heterogeneity, the more fragile is the enlargement of the integration. As it is observed from the results, there is a quadratic nexus between integration and inequality, suggesting that at the higher level of integration inequality decreases. Therefore, widening the scope of economic integration, establishing wider trade cooperation with the countries of the region and realizing high trade volumes without isolation from world countries may reduce income inequalities. Besides, since economic/financial crises adversely affect all macro-economic indicators, especially income inequality, the implementation of common monetary and financial policies and the approximation of the economic policies of the member countries can be considered as an important factor in overcoming the economic/financial crises and inequalities.

References

Afonso, Antonio, Hans P. Grüner and Christina Kolerus. "Fiscal Policy and Growth: Do Financial Crises Make a Difference?". *European Central Bank Working Paper Series*, no 1217 (2010): 1-42.

Afonso, Oscar, Ana L. Albuquerque and Alexandre Almeida. "Wage Inequality Determinants in the European Union". *Applied Economics Letters* 20, (2013): 1170-1173.

Akıncı, Merter, Gönül Yüce Akıncı ve Ömer Yılmaz. "Gelir Eşitsizliğini Azaltmada Finansal Sistem Ne Kadar Etkin? Türkiye Ekonomisi Için Bölgesel Panel Veri Analizi [How Effective is Financial System to Reduce Income Inequality: A Regional Panel Data Analysis for Turkish Economy]". *TİSK Akademi* 10, no 20 (2015): 286-316.

Alderson, Arthur S. "Explaining the Upswing in Direct Investment: A Test of Mainstream and Heterodox Theories of Globalization". *Social Forces* 83, (2004): 81-122.

Alderson, Arthur S. and François Nielsen. "Globalization and the Great U-Turn: Income Inequality Trends In 16 OECD Countries". *American Journal of Sociology* 107, (2002): 1244-1299.

Ang, James B. "Finance and Inequality: The Case of India". *Southern Economic Journal* 76, (2010): 738-761.

Arellano, Manuel and Olympia Bover. "Another Look at the Instrumental Variables Estimation of Error-Components Models". *Journal of Econometrics* 68, no 1 (1995): 29-51.

Arestis, Philip, Panicos O. Demetriades and Kul B. Luintel. "Financial Development and Economic Growth: The Role of Stock Markets". *Journal of Money, Credit and Banking* 33, (2001): 16-41.

Atkinson, Anthony B., Lee Rainwater and Timothy M. Smeeding. "Income Distribution in OECD Countries: Evidence from the Luxembourg Income Study". *Social Policy Studies* 18, (1995): 1-159.

Beblo, Miriam and Thomas Knaus. "Measuring Income Inequality in Euroland". *Review of Income and Wealth* 47, (2001): 301–320.

Beck, Thorsten, Aslı Demirgüç-Kunt and Ross Levine. "Finance, Inequality and the Poor". *Journal of Economic Growth* 12, (2007): 27-49.

Beckfield, Jason. "European Integration and Income Inequality". *American Sociological Review* 71, (2006): 964-985.

Beckfield, Jason. "Remapping Inequality in Europe: The Net Effect of Regional Integration on Total Income Inequality in the European Union". *International Journal of Comparative Sociology* 50, (2009): 486-509.

Beedles, William L. "A Micro-Econometric Investigation of Multi-Objective Firms". *The Journal of Finance* 32, no 4 (1977): 1217-1233.

Bick, Alexander. "Thresholds Effects of Inflation on Economic Growth in Developing Countries". *Economics Letters* 108, no 2 (2010): 126-129.

Bollen, Kenneth A. "An Alternative Two Stage Least Squares (2SLS) Estimator for Latent Variable Equations". *Psychometrika* 61, (1996): 109-121.

Bonesmo-Fredriksen, Kaja. "Income Inequality in the European Union". *OECD Economics Department Working Papers*, no 952 (2012): 1-26.

Brandolini, Andrea. "Measurement of Income Distribution in Supranational Entities: The Case of the European Union". In *Inequality and Poverty Re-examined*, editors S. P. Jenkins and J. Micklewright, Oxford: Oxford University Press, 2007.

Busemeyer, Marius R. and Tobias Tober. "European Integration and the Political Economy of Inequality". *European Union Politics* 16, no 4 (2015): 536-557.

Calderon, Cesar and Lin Liu. "The Direction of Causality between Financial Development and Economic Growth". *Journal of Development Economics* 72, (2003): 321-334.

Caner, Mehmet and Bruce E. Hansen. "Instrumental Variable Estimation of a Threshold Model". *Econometric Theory* 20, (2004): 813-843.

Caporale, Guglielmo M., Christophe Rault, Robert Sova and Anamaria Sova. "Financial Development and Economic Growth: Evidence from Ten New EU Members". *DIW Berlin German Institute for Economic Research Discussion Papers*, no 940 (2009): 1-42.

Claessens, Stijn and Enrico Perotti. "Finance and Inequality: Channels and Evidence". *Journal of Comparative Economics* 35, (2007): 748-773.

Clarke, George R. G., Lixin Xu and Heng-Fu Zou. "Finance and Income Inequality: What Do the Data Tell Us?". *Southern Economic Journal* 72, (2006): 578-596.

Cornia, Giovanni A. "Economic Integration, Inequality and Growth: Latin America versus the European Economies in Transition". *Review of Economics and Institutions* 2, no 2 (2011): 1-31.

Dhrifi, Abdelhafidh. "Financial Development and the 'Growth-Inequality-Poverty' Triangle". *Journal of Knowledge Economy* 6, no 4 (2015): 1163-1176.

Furceri, Davide and Prakash Loungani. "Capital Account Liberalization and Inequality". *IMF Working Paper*, no WP/15/243 (2015): 1-26.

Galor, Oded and Omer Moav. "From Physical to Human Capital Accumulation: Inequality and the Process of Development". *Review of Economic Studies* 71, (2004): 1001–1026.

Gowland, David and Arthur Turner. *Reluctant Europeans: Britain and European Integration, 1945-1998*. New York: Routledge, 2014.

Greenwood, Jeremy and Boyan Jovanovic. "Financial Development, Growth and Distribution of Income". *Journal of Political Economy* 98, (1990): 1076-1107.

Hansen, Bruce E. "Threshold Effects in Non-Dynamic Panels: Estimation, Testing, and Inference". *Journal of Econometrics* 93, no 2 (1999): 345-368.

Hoffmeister, Onno. "The Spatial Structure of Income Inequality in the Enlarged EU". *Review of Income and Wealth* 55, (2009): 101–127.

Honohan, Patrick. "Financial Development, Growth and Poverty: How Close Are the Links?". *World Bank Policy Research Working Paper*, no 3203 (2004): 1-31.

Jalilian, Hossein and Colin Kirkpatrick. "Does Financial Development Contribute to Poverty Reduction?". *The Journal of Development Studies* 41, (2005): 636-656.

Jaumotte, Florence, Subir Lall and Chris Papageorgiou. "Rising Income Inequality: Technology, or Trade and Financial Globalization?". *IMF Economic Review* 61, (2013): 271-309.

Kaltenbrunner, Annina, Gary Dymski and Hanna Szymborska. "Financialization and Inequality: A European Challenge". *Queries* 7, (2015): 34-36.

Kremer, Stephanie, Alexander Bick and Dieter Nautz. "Inflation and Growth: New Evidence from a Dynamic Panel Threshold Analysis". *Empirical Economics* 44, no 2 (2013): 861-878.

Kunieda. Takuma, Keisuke Okada and Akihisa Shibata. "Finance and Inequality: How Does Globalization Change Their Relationship?". *MPRA Paper*, no 35358 (2011): 1-46.

Kuo, Kuo H. and Cheng T. Lee. "Economic Integration, Growth and Income Distribution". *Australian Economic Papers* 56, no 1 (2017): 59-71.

Kuznets, Simon. "Economic Growth and Income Inequality". *The American Economic Review* 45, (1955): 1-28.

Kuznets, Simon. "Quantitative Aspects of the Economic Growth of Nations: Viii. Distribution of Income by Size". *Economic Development and Cultural Change* 11, (1963): 1-80.

Law, Siong H. and Hui B. Tan. "The Role of Financial Development on Income Inequality in Malaysia". *Journal of Economic Development* 34, (2009): 153-168.

Lundberg, Mattias and Lyn Squire. "The Simultaneous Evolution of Growth and Inequality". *The Economic Journal* 113, (2003): 326-344.

Maddison, Angus. *Economic Growth in the West: Comparative Experience in Europe and North America*. Great Britain: Routledge, 2014.

Masten, B. Arjana, Fabrizio Coricelli and Igor Masten. "Non-Linear Effect of Financial Development: Does Financial Integration Matter?". *Journal of International Money and Finance* 27, (2008): 295-313.

Milanovic, Branko. "Explaining the Increase in Inequality during Transition". *Economics of Transition* 7, (1999): 299-341.

Obstfeld, Maurice. "Risk-Taking, Global Diversification and Growth". *American Economic Review* 84, (1994): 1310-1329.

Odhiambo, Nicholas M. "Finance-Growth-Poverty Nexus in South Africa: A Dynamic Causality Linkage". *The Journal of Socio-Economics* 38, (2009): 320-325.

Park, Donghyun and Kwanho Shin. "Economic Growth, Financial Development and Income Inequality". *ADB Economics Working Paper Series*, no 441 (2015): 1-31.

Patrick, Hugh T. "Financial Development and Economic Growth in Underdeveloped Countries". *Economic Development and Cultural Change* 14, (1966): 174-189.

Pradhan, Rudra. "The Nexus between Finance, Growth and Poverty in India: The Cointegration and Causality Approach". *Asian Social Science* 6, (2010): 114-122.

Rehman, Hafeez U., Sajawal Khan and Imtiaz Ahmed. "Income Distribution, Growth and Financial Development: A Cross Countries Analysis". *Pakistan Economic and Social Review* 46, (2008): 1-16.

Rewilak, Johan. "Finance Is Good for the Poor But It Depends Where You Live". *Journal of Banking & Finance* 37, (2013): 1451-1459.

Rosati, Dariusz K. "Growth Prospects in the EU-10 Member States after the Crisis". In *Post-Crisis Growth and Integration in Europe*, editors E. Nowotny, P. Mooslechner and D. Ritzberger-Grünwald, 45-62. USA: Edward Elgar, 2011.

Schumpeter, Joseph A. *The Theory of Economic Development*. Cambridge: Harvard University Press 1911.

Smeeding, Timothy M. "Changing Income Inequality in OECD Countries: Updated Results from the Luxembourg Income Study (LIS)". In *The Personal Distribution of Income in an International Perspective*, editors R. Hauser and I. Becker, 205-224. Berlin: Springer, 2000.

Western, Bruce. *Between Class and Market: Postwar Unionization in Capitalist Democracies*. Princeton: Princeton University Press, 1997.

Yüce Akıncı, Gönül ve Merter Akıncı. "Ters-U Hipotezi Bağlamında Ekonomik Büyüme, Finansal Kalkınma ve Gelir Eşitsizliği Mekanizmaları Üzerine". *Finans Politik ve Ekonomik Yorumlar* 53, no 622 (2016): 61-78.

Yüce Akıncı, Gönül, Merter Akıncı ve Ömer Yılmaz. "Financial Development-Economic Growth Nexus: A Panel Data Analysis upon OECD Countries". *Hitotsubashi Journal of Economics* 55, (2014): 33-50.

Zhang, Quanda and Rongda Chen. "Financial Development and Income Inequality in China: An Application of SVAR Approach". *Procedia Computer Science* 55, (2015): 774-781.