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Revisiting the Financial Development and Income Inequality Nexus: Evidence from Hungary

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Abstract. The finance–inequality nexus has been a major topic of discussion since the 1990s and became even more so after the financial crisis of 2007–08. This paper aims to empirically investigate whether financial development and/or financial openness increased or decreased income inequality in Hungary over the period of 1971–2019. An empirical analysis of an autoregressive distributed lag (ARDL) model suggests the existence of long-run co-integration between the analysed variables. Financial openness contributes to reducing Hungarian income inequality in the short run but fuels greater income inequality in the long run. Whereas the effects of financial development on inequality vary according to the indicators, the domestic credit by banks has a significant negative effect on inequality in the short and long run, while the impact of the credit to the private sector from all the sectors on inequality is insignificant.

Keywords: financial development, income inequality, Hungary, ARDL

JEL Classification: G10, G21, O15, D63, C22

1. Introduction

Rising inequality is a major social and economic issue and is the most controversial issue within most countries, as well as a global challenge that worries policymakers and researchers. In fact, the major concern results from the potential negative economic and social impacts of inequalities, rather than from the inequality issue itself (Rajan, 2011; Stiglitz, 2012; Dabla-Norris et al., 2015). Thus, inequality is more than a sign of low income in the lower deciles, or perhaps an indication of

a lack of chance and income mobility or a signal of a lack of income mobility and opportunity, which requires attracting considerable attention and calls for action.

Because of this concern, the inequality topic has received greater attention from international organizations. For example, Goal 10 of the UN's Sustainable Developments (SDGs) (https://sdgs.un.org/goals/goal10) emphasizes reducing inequality as a crucial priority and its role in achieving agenda 2030 SDGs. As a result, increasing equality has become a top priority for policymakers in all countries.

In addition, several questions related to income distribution and wealth inequality have been raised by researchers, especially after the global financial crisis of 2007–08 (e.g. Stiglitz, 2012, 2016; Piketty, 2014; Morelli and Atkinson, 2015) that led to the inequality issue and moved into the limelight of a public debate. Further, COVID-19 and the current economic crisis have deepened existing inequalities and poverty since it hit the poorest and most vulnerable communities the hardest and amplified the impacts of the pandemic, according to international reports (e.g. UNDP, 2023; World Bank, 2023).

A literature review of factors that may contribute to exacerbating income inequality suggests that those factors are: access to economic and financial resources (de Haan and Sturm, 2017), structural change (Kum, 2008), the reduced role of labour unions (Morelli and Atkinson, 2015), technological change and globalization (Jaumotte et al., 2013), scarcity rents (Stiglitz, 2012), international trade (Stiglitz, 2015), tax and transfer system (Piketty, 2014), financial development (hereafter, FD), and financial liberalization (hereafter, FL), as de Haan and Sturm (2017) and Furceri and Loungani (2018) have reported. However, this study will focus primarily on the relationship between FD/and or FL and inequality in Hungary and how finance can affect inequalities directly and indirectly.

The financial literature has long acknowledged the importance of finance in economic growth by channelling financial resources into the most productive uses, but that body of research does not address the question of who benefits more from this growth if the rich or the poor may benefit disproportionately from FD (Levine 2021). Especially access to financing is more constrained for impoverished people since it is based on their income level and capacity to provide collateral (Rajan and Zingales, 2003).

Indeed, up until the 1990s, when the endogenous growth theory emerged, underlining the relevance of finance in reducing inequality, FD and inequality had been separate issues. Later on, scholars held opposing viewpoints. For example, Rajan and Zingales (2003) argue that FD/or FL does not have to assist individuals on low income but may fall disproportionately on the rich. On the contrary, the endogenous growth theory gives grounds to believe that low-income persons gain disproportionately from FD/FL (Banerjee and Newman, 1993; Galor and Zeira, 1993). It also helps to reduce the persistence of relative income disparities

across generations by making financial services more accessible to people who previously did not have access because of limitations and high costs (Greenwood and Jovanovic, 1990). Third, FD/and or FL are frequently associated with increased financial insecurity and financial crises, which have devastating effects on inequality because poor and low-income families are the most vulnerable to shocks and are harmed the most by policy responses to the financial crises (de Haan and Sturm, 2017). As a result, the relationship between inequalities and finance concepts started as a major topic of discussion and increased after the financial crisis of 2007–08. Until now, doubts and concerns about this relationship are still growing every day (Levine, 2021; Biyase, et al. 2023; Biyase and Chisadza, 2023). Thus, there is a strong evidence that countries with a high financial development level have a higher rate of income inequality (de Haan, 2017; de Haan et al., 2022).

Remarkably, in the world, the income inequality within countries has soared throughout the last four decades, and Hungary is no exception to this. The income gap and wealth inequality have widened over the past 40 years. In this context, the household income share held by the wealthiest 10 per cent has shown a sharper increase than the other deciles. Financial assets may appear to be the primary drivers of their income increase and wealth concentration (Mavridis, 2017; Evans et al., 2022; Chancel et al., 2021; Wang et al., 2023) given that they held nearly 70 per cent of financial assets in 2017 (European Central Bank (ECB), 2021). In particular, financial rents have been the key drivers of income for those at the top of the distribution ladder in the last decades (Stiglitz, 2012, 2016; Bolton et al., 2016). Thus, this requires scrutiny and attention to the relationship between FD and inequality in Hungary. After scrutinizing and reviewing the literature on the relationship between FD or FL and inequality in Hungary during the last three decades, we found that more studies are needed in this regard. Especially the conclusions of existing studies are contradictory, inconclusive, and also dominated by cross-country analyses.

Hungary could be an interesting case study of the finance–inequality nexus because of the considerable changes in the financial system and the increasing inequality trend since the collapse of the Soviet communist era. The Hungarian financial system has seen the launching of various financial restructuring programmes during the transition process, leading it to become one of the best-developed systems in the EU at the beginning of the new millennium. However, this system also endured two financial crises in 1991 and 2008, which considerably affected this system. Recently, the financial sector has improved significantly, as its indicators showed.

However, we do not know how these changes affect inequality, and decision makers lack evidence. On the other hand, Hungarian literature on these effects is also insufficient and dominated by cross-country analyses (e.g. de Haan and Sturm, 2017; Bezemer and Samarina, 2016; Zhang and Naceur, 2019; Nguyen et al.,

2019; Kavya and Shijin, 2020; Mbona, 2022). In addition, it seems that their results lead to conflicting predictions about the finance–inequality nexus in Hungary and other countries. For example, the study of de Haan and Sturm (2017) provides evidence for supporting the finance–inequality widening hypothesis. Zhang and Naceur (2019) and Cevik and Correa-Caro (2020) established that extending the availability of financial services to low-income consumers and small projects might contribute to reducing inequality. However, Kavya and his colleague Shijin failed to find clear-cut evidence to support reducing income inequality. In contrast to the findings of Nguyen et al's (2019) study, Mbona (2022) indicated that financing lowers inequality in the first stage but raises it in the second. Accordingly, we aim to empirically assess the role of FD/FL in inequality by examining whether the FD/FL in Hungary had a relationship with income inequality in the short and long run.

The primary objectives of this study are: (i) contributing to the scant information on the specific relationship between FD and/or FL and income disparity in Hungary and filling a gap in the existing literature (e.g. Bezemer and Samarina, 2016; Zhang and Naceur, 2019; Nguyen et al., 2019; Kavya and Shijin, 2020; Mbona 2022); (ii) besides increasing our understanding of these relationships, addressing the questions is critical for policymakers to determine if Hungary's FD and FL policies can accomplish the UN SDG 10 target; (iii) the empirical results of this study may help policymakers create strategies for achieving Hungary's financial stability goals; (iv) contributing to the debate on the effectiveness of FD on income inequality and to the macroeconomic literature on the finance–inequality nexus (Levine, 2021; Biyase et al., 2023; Biyase and Chisadza, 2023).

The remainder of this essay is structured as follows: the literature relating FD to inequality is reviewed in Section 2; Section 3 outlines Hungary's FD and income inequality experiences; Section 4 presents the model and data; Section 5 presents and analyses the findings; Section 6 concludes with statements.

2. Literature Review

2.1. Theoretical Discussion

Indeed, the theoretical relationship between FD and inequalities goes back to the Financial Kuznets (1955a–b) Curve (FKC) hypothesis, in which finance initially leads to worse equality, up to a peak, followed later by reduced inequality. The early studies supported Kuznets's hypothesis; however, it was later refuted (Barro, 2000; Piketty, 2014). In particular, there is increasing evidence that an economy with higher FD levels has high inequality ratios.

With the emerging endogenous growth theory in the 1990s, the model of Greenwood and Jovanovich (1990) explained how FD and income inequality

variables have an inverted U-shaped connection. Three years later, Galor and Zeira (1993) and Banerjee and Newman (1993) rejected the inverse U-shaped hypothesis of the relationship between finance and inequality and claimed that the squared financial system indicator representing this relationship was checked and found to be statistically insignificant; hence, they predict a linear negative relationship between the two variables.

The endogenous growth theory models put forward the inequality-narrowing hypothesis of finance by its influence on the extensive margin of financial services, whereby financial improvements lead to capital allocation and boost economic opportunities for underprivileged groups. Thus, investment in business and education, regardless of inheritance wealth, increases the demand for labour. Besides, it also helps to reduce the persistence of relative income disparity across generations.

Nonetheless, this widely held belief has been called into doubt in the literature since the turn of the millennium, and an opposite hypothesis emerged that finance may have a stronger effect on the intensive margin, which only benefits the ones already using those services. Rajan and Zingales (2003) put forward that in the absence of well-functioning institutions, finance advances towards the inequality-widening and not inequality-narrowing hypothesis due to poor protection (Chong and Gradstein 2007). Later, this view has been empirically confirmed by Law et al. (2014) and de Haan and Sturm (2017).

In the last decade, an even vaster literature has suggested that FD and FL are often associated with high ratios of financial instability and financial crises (Rajan, 2011). Hence, low-income individuals will become more vulnerable (de Haan and Sturm, 2017), especially in times of recession, which often follow a crisis (Morelli and Atkinson, 2015). In this context, several theoretical considerations have forcefully suggested that income inequality is one predictor of financial crises because of over-indebtedness (Schularick and Taylor, 2012). Some researchers, however, suggest that governments' monetary policies, financial liberalization, and reform dynamics may have both direct and indirect effects on the finance–inequality nexus (Atkinson and Morelli, 2011). Recently, some theoretical arguments point out the role of increasing rent extraction in rising income inequality (Stiglitz, 2012, 2016; Bolton et al., 2016), either through financial innovations that are inefficient or damaging (Bolton et al., 2016) or through the wages of employees in the financial sector (Demirgüç-Kunt and Levine, 2009; Philippon and Resheff, 2012; Piketty, 2014).

In the financial theory, FD and FL do not have effects only on the current incomes but also on the income inequality across dynasties through wealth accumulation. According to Greenwood and Jovanovic's (1990) model, FD can influence accumulating assets by reducing the information and transaction costs, allowing individuals to benefit from economies of scale in screening projects. Extra

investment options become available to low-income savers and talents, which helps to increase their wealth. However, the direct effect of increasing stock prices could fall disproportionately on the wealthy, causing a further significant widening of inequality (Domanski et al., 2016). Particularly rising values of households' bond portfolios are significantly associated with rising equity prices. Additionally, high equity returns are the major drivers of wealth at the top of the distribution, as emphasized by Domansky and others. In the same vein, some seminal papers (Stiglitz, 2015, 2016) stated that wealth inequality has been made higher than income inequality over the recent decades by credit creation, which finances the remuneration of rent-generating activities via allocating funds towards more remunerative things, such as securitization and financial engineering, which promote rents and especially financial system rents.

2.2. Empirical Literature

A considerable amount of literature on the relationship between finance and inequality and the findings of the empirical literature on this nexus are similar to theoretical literature and are far from conclusive. These empirical studies could be divided into five main strands.

In the first strand, the studies showed that countries with less income inequality have higher levels of FD, and alleviating income disparity could be achieved through implementing policies aiming to enhance FD. For example, using the four dimensions of FD (access, efficiency, deepening, and stability) on a sample of 143 countries (including Hungary) covering the period from 1961 to 2011, Zhang and Naceur (2019) applied the exogenous instruments method. The authors suggest that contrary to FL, FD reduces income inequality and poverty, and FD affects income inequality more via bank credit channels than via the capital markets' credit channels. Similarly, Cihak and Sahay (2020) examined the empirical relationship between income inequality and FD using panel data for 128 economies (including Hungary) during the period of 1980–2015. They looked into three aspects: financial depth, inclusion, and stability. The authors reasoned that FD may help to reduce inequality by making financial services more accessible to low-income customers and small businesses. The same finding has been reached by Cevik and Correa-Caro (2020), who investigated the main determinants of income inequality in 29 transition countries (including Hungary) between 1990 and 2018.

Contrarily, the second researchers' strand demonstrated that a deeper FD might worsen inequality rather than reduce it. Accordingly, they support the hypothesis of a widening impact of FD on income inequality (e.g. Kim and Lin, 2011; Jauch and Watzka, 2011; Sehrawat and Giri, 2016; Adams and Klobodu, 2016; de Haan and Sturm, 2017; Maldonado, 2017; Bittencourt et al., 2018; de Haan et al., 2022). De Haan and Sturm, for example, employ a panel fixed and random effects model

for a sample of 121 countries (including Hungary) between 1975 and 2005 to investigate the impacts of FD, FL, and banking crises on income inequality. The results of the study show that all financial variables increase income inequality. In addition, both the level of FD and the quality of institutions' conditions affect the impact of FL on inequality.

The third strand of researchers concluded that the link between the two variables depends on the extent of a country's level of FD (e.g. Rehman et al., 2008; Nikoloski, 2013; Baiardi and Morana, 2016; Basirat et al., 2016; Cong Nguyen et al., 2019; De la Cuesta-González et al., 2019; Hassan and Meyer, 2021). They found the Financial Kuznets Curve (FKC) hypothesis to be valid. For instance, from 1961 to 2017, Cong Nguyen and his colleagues empirically evaluated the relationship between finance and inequality for 21 emerging economies, including Hungary (2002–16). They used various proxies of FD and employed the Dynamic OLS (DOLS) and the Fully Modified OLS (FMOLS) methods to investigate the FKC on FD and income inequalities. The result of their study supported the existence of an inverted U-curve hypothesis.

Contrarily, many studies rejected the FKC hypothesis (e.g. Ang, 2010; Batuo et al., 2010; Elmi and Ariani, 2011; Jauch and Watzka, 2011; Shahbaz and Islam, 2011; Tiwari et al., 2013; Sehrawat and Giri, 2015; Wajid and Awan, 2021), while other studies supported the "too much finance hypothesis", in which increasing FD first improves income equality and then, after reaching a threshold, growth in FD enhances income inequality (e.g. Younsi and Bechtini, 2018; Mbona, 2022). Mbona employed the generalized method of moments (GMM) on the panel data of 120 countries (including Hungary) from 2004 to 2019. Her study established that the "too much finance hypothesis" holds in the selected countries, and the effects of FD's various characteristics on income inequality vary.

According to the fourth study strand, FD has no effect on inequality (e.g. Law and Tan, 2009; Seven and Coskun, 2016; Ahmed and Masih, 2017; Kavya and Shijin, 2020). Using dynamic panel data approaches, Seven and Coskun found no connection between FD and income disparity in 45 rising nations from 1987 to 2011. Using a panel of 85 economies, including Hungary, between 1984 and 2014, Kavya and Shijin recently employed a threshold regression approach and unbalanced dynamic panel GMM estimation model. They came to the conclusion that there is not any conclusive evidence to promote lowering disparity in income and that Hungary, a high-income nation, does not gain from FD.

Finally, the findings of the last strand led to mixed results. For example, Bahmani-Oskooee and Zhang (2015) suggested that only in 10 out of the 78 countries included in their study are there effects of financial market development on income distribution in the short run and in three countries in the long run. A year later, Bezemer and Samarina (2016) found that the impact of FD on inequality varies according to the components of FD, their study being based on

26 EU countries (including Hungary) and conducted between 1990 and 2012. While bank credit to real estate and financial asset markets increases inequality, credit to non-financial businesses and household consumption decreases income inequality. The inequality-narrowing hypothesis was confirmed to be true in the short term by Wajid and Awan (2021) while the inequality-widening hypothesis in the long run.

In brief, economic theories appear to forecast incongruently, and, similarly, empirical investigations' findings revealed a sizable disparity. These contradictory predictions can be put down to a difference in the times of the inquiry, the measures and indicators employed, and the methodologies. They suffer from a lack of data and methodological limitations. On the other hand, cross-country analysis predominates in the Hungarian literature, which is likewise insufficient for Hungarian decision makers.

3. Financial Development and Income Inequality in Hungary

3.1. Financial Sector Reforms in Hungary

Hungary's financial sector is less developed than the industrialized European countries, with the bank-based financial system serving as the primary source of credit for non-financial firms. Similar to other Visegrád countries, Hungary had to develop its financial system during the transition period, which was inefficient during the communist era and passed through a financial crisis in 1991 because Hungarian banks were technically insolvent and due to the economic collapse, along with terrible legacies of the past (Botos, 2019). The establishment of a two-tier banking system in 1987 and the government's bailout plan for the banks' aftermath of the financial crisis in 1991 played a part in the transformation of the banking industry and strengthened the quality of their portfolios.

And as part of the economy's fundamental transition, this sector has seen a substantial, quick privatization process reflected in the rapidly increasing foreign-held shares as part of the total assets of banks (Hasan and Marton, 2003), and it resumed Budapest stock market activities after having been interrupted during the communist era. The essential regulatory framework for this sector's functioning was constructed, including launching new laws and regulations for the securities market and credit institutions. Furthermore, a reform in monetary policy permitted banks to perform services such as investment transactions. These changes have increased the efficiency of the banks, which served as one of the growth drivers around the year 2000.

Besides, other factors reinforced FD and FL in Hungary such as transfers from closed economics to open markets and European integration, recommendations of the World Bank, a flourishing of ideas of the endogenous growth theory that emphasizes the importance of FD and FL in both economic growth and improving the standard of living and the quality of life. As a result, the Hungarian financial system became one of the best-developed systems in the EU at the beginning of the new millennium. For example, improving regulation and monitoring was spurred as part of the European integration process and the necessity to implement EU standards by 2004. As a result, Hungary eliminated capital mobility limitations, and the central bank passed a new regulation in 2001 that corresponded to EU norms (MNB, 2002).

The Hungarian financial system, integrated with the international system, embraced new operational methods and became one of the region's most advanced systems. Its banking system began to enjoy the benefits of being sufficiently funded, a high profitability, modernized services supported by external sources, and a well-developed banking culture (Bod, 2017). The increased access to credit with an expansion of sales channels and of regional branch networks improved depth and efficiency and grew consumer trust in Hungary and on the global financial markets (Kovács, 2019).

However, this resulted in an unhealthy banking sector and increased the country's external vulnerability due to its heavy reliance on foreign finance, short-term debt, and derivative instruments and a high level of government debt. As a result, when the 2008 crisis set in, Hungary faced a liquidity issue, forcing it to get an IMF-EU loan, followed by an economic recession up until 2012.

The crisis and its effects put the Hungarian banking industry through many hardships. Credit institutions witnessed a significant decline in their investment portfolios, reflecting declining demand and supply for credit, and they lost their competitiveness because of the increase in expenses. Households were unwilling to apply for loans because of the high monthly repayment obligation, and, at the same time, the overall economic environment's uncertainty and recessionary pressures reduced banks' desire to lend. These and other factors, such as high credit risk and low internal capital generation capacity, led to a decline in lending (MNB, 2014). In addition to government initiatives, such as the early payment system and the new banking tax, which impacted bank performance through poor profitability and restrictive lending conditions, these factors also contributed to fast deleveraging.

The government implemented several measures to mitigate the effects on banks, including capital injections and unconventional monetary policy measures aiming to address weak bank lending activity, such as the Funding for Growth Scheme and the Growth Supporting Programme. These played a significant role in both economic growth and in avoiding a credit crunch, and the turnaround in corporate lending. Initially, the monetary policy focused on assistance lending to SMEs that

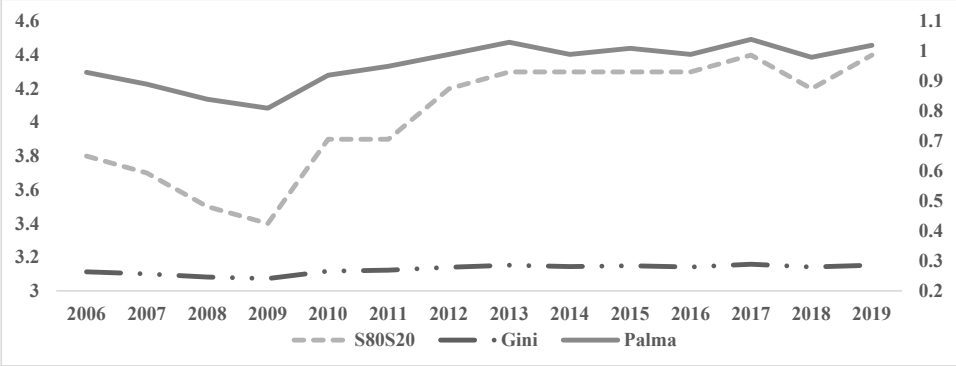
commenced in 2013 and later to big enterprises and the family sector in 2016, but credit requirements have generally remained conservative (MNB 2021).

3.2. Inequality in Hungary and Its Relatedness with Finance

Hungary witnessed an increase in income inequality over four decades owing to different factors across time, which are somehow similar to those in all the transition countries. For example, income inequality increased in the late 1980s and early 1990s due to various reforms and policies such as privatization, deregulation, and austerity measures. While the impact of FD and/or FL related to Foreign Direct Investment (FDI) in the late 1990s contributed to a slight increase in employment, it also contributed to inequality by creating a dual labour market.

Although income distribution showed stagnation in the second half of the 1990s, it then increased again to peak in 2006. According to the Eurostat database (2021), the Gini coefficient of equivalized disposable income increased by 9.3 points between 2003 and 2006 (where the Gini index reached 33.3 per cent). Several factors shaped inequality during this period such as the welfare state in 2003, benefit cuts, tax policies after joining the European Union in 2004, and austerity in 2006.

Inequality increased during the financial and economic crises because of the high unemployment rate, decreasing real income, the burden of loan repayment, and response policies to the financial crisis. Relatively ungenerous income redistribution policies, taxation systems, globalization, skill-biased technology, and wealth accumulation have been the main determiners of increasing inequality in the last decade.



Source: author's calculations based on data from OECD (2023)

Note: Gini and Palma indicators (right-hand scale).

Figure 1. *Income inequality in Hungary*

In 2019, the Gini coefficient (where "0" marks equality and "1" total inequality) of equivalized disposable income reached a record of 28 per cent, while it was 24.1% in 2009, according to data from the Hungarian Central Statistical Office (HCSO, 2021 – https://www.ksh.hu/stadat_files/ele/en/ele0009. html), even under crisis circumstances. On the other hand, the GINI indicator exceeds the average of the V3 countries in 2019, but it falls short of the EU average. Similarly, the Palma ratio (the disposable income share of the top 10% to that of the bottom 40%) in Hungary increased by 21 points during the past ten years, reaching 102 in 2019 (Organization for Economic Co-operation and Development (OECD), 2023), as *Fig.* 1 shows. The human development measure (the top rich 20% to the poorest 20%) of the United Nations Development Programme (UNDP) was 3.6 in 2008 and increased to 4.2 by 2018, being the highest value among the Visegrád countries in 2020 (Eurostat 2022). Thus, we can argue that Hungary still needs to make further efforts to achieve goal No. 10 of the SDGs, even in a regional comparison.

The severe material deprivation rate in 2018 is also among the highest ratios in the EU countries and above the EU average by 3.2 points, as well as the highest among the Visegrád countries (HCSO 2021).

Similarly, the top 1 and the top 10 per cent shares have seen rapid increase patterns at the expense of the other groups, and capital income forms a large percentage of their earnings. In particular, wealth inequality in Hungary is like in other countries, i.e. significantly higher than income inequality. Financial assets appear to be a significant driver of the increase in wealth concentration in the top decile in Hungary, who possessed roughly 70% of the financial assets and more than half of total household wealth in 2017, while the lower 50% of households held only 8.9 per cent (ECB 2016; 2021). Moreover, owing to the effects of the coronavirus pandemic, equity prices and house prices experienced an increase, raising wealth and income inequalities in 2020.

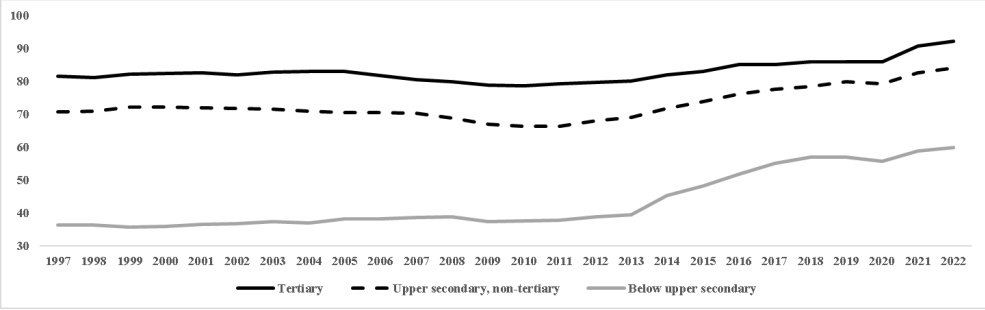
Income disparities in Hungary, like in other countries, are the result of a number of factors. According to the economic theory, finance is one of the factors that may affect inequality directly (funding conditions, returns on financial assets, wealth accumulation, and investment in human capital) or indirectly, through several channels such as economic growth, financial crises, political capture, etc. (Banerjee and Newman, 1993).

Human capital mechanisms are typically highly correlated with economic opportunities and labour earnings, which forms more than two-thirds of income inequality, as suggested by Demirguc-Kunt and Levine (2009). Thus, FD will improve equality by enhancing human capital over generations regardless of the parents' education and wealth (Galor and Zeira, 1993; Demirgüç-Kunt and Levine, 2009).

In Hungary, despite the considerable growth in education that happened since the financial openness in the middle of the 1990s, the importance of parental background still plays an increased role in student trajectories (Eurofund,

2017; Róbert, 2019; Medgyesi, 2019; WEF, 2020; UNDP, 2021; Bukowski et al., 2022), particularly in admissions to universities or obtaining certain university degrees (Hordósy and Szanyi, 2020). On the other hand, FD has not reduced the employment gap between highly educated and medium- and low-educated labourers, as per the financial theory – see *Fig. 2*.

Interestingly, the increasing employment in the past decade was owing to the public works scheme, which has been considerably implemented since 2010, and to job creation in the primary labour markets. In this context, contrary to other CEE countries, self-employment rate (% of employment) gradually declined from 20.5 per cent in 1991 to 10.8 per cent in 2019 (according to data from the World Bank) even though the Hungarian financial system saw a considerable improvement during this period.



Source: author's calculations based on data from OECD database (2022)

Figure 2. *Employment by the education level of 25–64-year-olds (as %)*

Thirdly, it has been revealed that the rate of students' drop-out of school increased in Hungary during the shocks; thus, FD did not reduce this impact (*OECD data* on *Education)*, and the percentage of persons experiencing financial difficulties increased. For example, the lowest-income household quantile suffered the most from the burden of loan repayment obligations because they had to pay a higher share of their income towards their debts (Tóth, 2016). Furthermore, according to the OECD/European Observatory, 12 per cent of families in Hungary experienced catastrophic healthcare costs in 2015 (OECD/European Observatory, 2019).

Besides, easy access to finance and financial services in the pre-crisis years of 2008 was also one channel for increasing inequality since it led to over-indebtedness and instability, which contributed to the crisis (Ranciere and Kumhof, 2010). Because the crisis was followed by an economic downturn and high unemployment, the lower-income deciles suffered the most (Tóth, 2016). Furthermore, as a response to the crisis, social and fiscal policies have been adjusted (Aristei and Perugini, 2014), which is reflected in increasing their financial difficulties to pay obligations.

Deregulation reforms with privatization and financial globalization also amplified inequality in Hungary through an accumulation of wealth and portfolio equity (Mavridis and Mosberger, 2017), which is highly correlated with rent seeking (Demirgüç-Kunt and Levine, 2009; Piketty, 2014). Mavridis and Mosberger suggested that the income share from the capital profits of those at the upper tail of the income distribution rapidly increased in Hungary and reached the level in the USA over the two decades after the transition period, which played a significant role in inequalities. They said that people in the top 1% and the top 0.1% of the income distribution have received above 25% and 50% of their income from capital income respectively. Conversely, those in the lower deciles received smaller shares of their income from capital.

On the other hand, deregulation led to inequality by allowing the wealthy to control financial and economic policies, benefiting themselves and increasing their wealth. For example, this capturing weakened the prevision and prudential regulation mechanisms, leading to increasing irresponsible risk-taking and immoral hazards by the financial actors during the pre-crisis years (MNB, 2017). In addition, the wealthy interest groups have also used their financial power to cut public expenditure and keep a downward pressure on top income tax rates, capital gains, and inheritance wealth. Thus, taxation has become less capable of redistributing gains from significant economic growth since 2010, whereby introducing both the flattening of tax and consumption tax played an important role in the income and asset situation. Moreover, work policy capturing was beneficial to the businesses through reducing labour unions' ability to negotiate, and diminishing labour protections adversely affects economic and social equality. All of these factors contributed to shifts in the composition of incomes, wherein the share of equity income raised at the account of the income labour share.

According to financial theory, finance can indirectly affect inequality through economic growth mechanisms (Galor and Zeira, 1993; Kuznets, 1955a–b). However, in Hungary, high economic growth coincides with increased inequality: for example, FDI initially fuelled economic growth in the second half of the 1990s and contributed to a slight increase in employment, but it also had several consequences for income distribution. Thereby, it contributed to raising inequality between those who worked and those who were out of the labour market, even among workers, and increased labour inequality by wage premiums for educated workers and non- or low-educated workers (Kopasz et al., 2013). Similarly, inequalities have increased in recent years in tandem with economic growth.

On the other hand, FDI created a dual labour market, with international companies of higher productivity and higher wages and domestic companies with low productivity and wages, poor working conditions, and less insecure jobs. Moreover, a high degree of dependence on FDI in Hungary played an important role in exacerbating inequality where the FDI was concentrated in the prosperous northern and western parts of

Hungary (e.g. the Budapest, Győr-Moson-Sopron, and Esztergom regions), while the FDI ignored the poor, lesser developed parts in the northeast and southeast of Hungary, which resulted in high regional inequalities, even compared to the Czech Republic (Buti and Székely, 2019; Neszmélyi et al., 2022).

4. Data and Methodology

4.1. Data and Variables

Based on the literature on the link between FD and inequality, we postulate the following model:

$$GINI_t = \beta_0 + FD_t + CV_t + \mu_t.$$

GINI measures income inequality in society. I use the Market-Gini because it is a good proxy for income inequality before taxes, as has been suggested by de Haan and Sturm (2017). Political money capturing affects government spending and taxes, which has an enormous influence on shaping income distribution, so I use post-tax-Gini (GINID) to check the robustness.

FD is a level of financial development in Hungary. This paper uses the credit ratio to the private non-financial sector from banks to GDP (CB) as a proxy for FD. I use this ratio because, firstly, it might be superior to other alternative measures of FD (such as the money supply (M2) ratio to GDP). Further, it evaluates the fundamental role of financial intermediaries by channelling population savings into private sector actions (Beck et al., 2007). In addition, it excludes credits and claims between banks and also credits to the government. The banking industry influences income inequality more than capital market capitalization, as Naceur and Zhang (2019) have noted.

To look at the connection between FL and inequality, the article employs a de facto index of financial openness (KOFF), which allows for an assessment of both the overall consequences of the openness of finances and the key components (FDI, capital equity, debt to other countries, reserve accumulation, and foreign income payments). In addition, de facto measures have a significant effect on the impact of de jure measures on inequality (Furceri et al., 2019). Despite previous studies showing mixed results regarding the influence of FD and FL on inequality, we expect financial proxies to affect inequality negatively.

In addition, other explanatory variables (CV) were added to the empirical model to control for the omitted variable bias. In particular, some studies reported these variables to influence the relationship between FD and income inequality, including EMP: the number of employees to capture changes in employment. SEC is a proxy

for education (school enrolment, % gross secondary) to capture heterogeneity in human capital. I expect that with increased variables, income inequality will decrease despite this impact also being affected by the quality of education and the supply and demand of the job market. However, higher education and skills lead to higher wages and employment opportunities. Finally, INF stands for Inflation and is a proxy for macroeconomic instability, assuming that a higher inflation rate worsens the income distribution.

For robustness check purposes, this paper replaced:

1. The market income Gini index (GINIM) by the disposable income Gini index (GINID) as a proxy for inequality.
2. The ratio of credit to private non-financial sector from banks to GDP(CB) by the credit ratio to the private non-financial sector from all sectors to GDP (CPNF) as a proxy for FD.
3. The age dependency ratio (ADG), instead of the number of employees, is a control variable.

This research is based on annual time series data from 1970 to 2019. I derived the data from the World Bank's indicators for development, the HCSO, the KOF Globalization Index (http://globalization.kof.ethz.ch/), International Financial Statistics (IFS), and Solt's (2022) Standardized World Income Inequality Database (SWIID).

4.2. The ARDL Estimation Technique

In order to examine the results of stationarity and cointegration tests among the models' variables, the empirical literature has used several selections of cointegration approaches. However, this paper used the ARDL bounds testing technique, which was developed by Pesaran et al. (2001), for its advantages over other estimation approaches such as the order of integration I (0) or I (1) should not be taken into account when using this technique and that it is a more reliable technique than the conventional one (Pesaran et al., 2001). Contrary to other techniques, ARDL enables the variables to have varied optimum lags, making it more statistically significant and resilient when we cannot have a large sample size. In addition, we employ the ARDL approach to estimate the link between variables in the long and the short run from the model's equation simultaneously. Finally, using a simple linear transformation (Banerjee et al., 1993), the Error Correction Model (ECM) can be obtained from ARDL. To investigate the relationship between income inequality and FD in Hungary, the following equation will be used:

$$\Delta GINI_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \Delta GINI_{t-1+} \sum_{i=1}^{k1} \beta_2 \Delta CB_{t-1} + \sum_{i=1}^{k2} \beta_3 \Delta KOF_{t-1} + \sum_{i=1}^{k3} \beta_4 \Delta EMP_{t-1} + \sum_{i=1}^{k4} \beta_5 \Delta SEC_{t-1} + \sum_{i=1}^{k5} \beta_6 \Delta INF_{t-1} + \delta 1\mathrm{GINI}t{-}1 + \delta 2\mathrm{CB}t{-}1 + \delta 3\mathrm{KOF}t{-}1 + \delta 4\mathrm{EMP}t{-}1 + \delta 5\mathrm{SEC}t{-}1 + \delta 6\mathrm{INF}t{-}1 + ut,$$

where GINI represents income inequality as a dependent variable, while the other variables are independent variables, as identified above: Δ denotes the first difference operator, μ t is an error term, β1–β6 represent the short-run coefficients, $\delta 1$–$\delta 6$ are the long-run coefficients, μ is the white noise errors, and k1–k5 are the optimal lag lengths for each series.

The next step after determining the optimal lag lengths for the ARDL model is Pesaran et al's (2001) bound test. According to this test, when the value of the F-statistic is higher than the upper bound critical value, the null hypothesis of no cointegration (H0: δ1 = δ2 = δ3 = δ4 = δ5 = δ6 = 0) will be rejected. Thus, the alternative hypothesis of cointegration is valid (H1: δ1 ≠ δ2 ≠ δ3 ≠ δ4 ≠ δ5 ≠ δ6 ≠ 0), a long-run relationship between a dependent variable and independent variables exists, and the conditional autoregressive distributed lag model can estimate the long-run coefficient.

Once the cointegration between the variables is insured, we can estimate an error correction model linked with the long-run estimates to derive the short-run dynamic parameters.

$$\Delta GINI t = \alpha 0 + \sum_{i=1}^{p} \alpha_{1i}\, GINI_{\,t-1} + \sum_{i=1}^{k1} \alpha_{2i} \Delta\, CB_{\,t-1} + \sum_{i=1}^{k2} \alpha_{3i} \Delta\, KOF_{\,t-1} + \sum_{i=1}^{k3} \alpha_{4i} \Delta\, EMP_{t-1} + \sum_{i=1}^{k4} \alpha_{5i} \Delta\, SEC_{\,t-1} + \sum_{i=1}^{k5} \beta_{6i} \Delta\, INF_{\,t-1} \upsilon\, ECM\, t-1 + \mu t$$

The results of the error correction model represent the period required to return to long-term equilibrium after a short-term shock.

5. Empirical Results

5.1. Unit Root Test

Before estimating the base model to test the hypotheses, it is critical to determine whether there is a mutual dependence among the variables to identify their integration order and prevent spurious correlation. I used the Augmented Dickey–Fuller (ADF) test, the Philips–Perron (PP-1988) test, and the Kwiatkowski–Phillips–Schmidt–Shin (KPSS-1992) unit root tests to check the stationarity of each variable**.** In *Table 1*, only the CB variable does not have a unit root in level, according to the ADF unit root test results. Thus, I cannot reject the null hypothesis at the level I (0). While at the first difference, all series are stationary, only the ADG variable is not stationary, as seen in the table.

All series are stationary only at the first difference according to the PP unit root test, and all variables are significant, ranging between 1 and 5 per cent level of significance; therefore, we rejected the null hypothesis. The results of the stationarity KPSS test show that the CB series only contains a unit root at the level I (0), while the CB, CPNF, INF, and SEC variables are not stationary at the first

difference. The results of all three-unit root tests suggest that the variables studied are stable at I (0) or at I (1). Therefore, we recommend adopting the ARDL bounds technique rather than one of the other cointegration tests.

Table 1. *Unit root tests for stationarity*

Variables	**At Levels**			**At 1st Difference**		
	ADF	**PP**	**KPSS**	**ADF**	**PP**	**KPSS**
GINID	-1.08	-0.68	0.77	-3.02	-3.03	0.12
Prob.	[0.72]	[0.84]	[0***]	[0.003***]	[0.003***]	[0.119*]
GINIM	-1.23	-0.64	0.84	-1.99	-2.02	0.13
Prob.	[0.66]	[0.85]	[0***]	[0.045**]	[0.04**]	[0.12*]
CB	-4.63	-1.84	0.08	-2.70	-3.93	0.10
Prob.	[0.00***]	[0.355]	[0.347]	[0.008***]	[0.004***]	[0.35]
CPNF	-2.38	-1.60	0.60	-2.02	-3.67	0.10
Prob.	[0.15]	[0.48]	[0.46**]	[0.043**]	[0.008***]	[0.74]
KOF	-1.05	-1.05	0.84	-7.75	-7.72	0.20
Prob.	[0.73]	[0.73]	[0.739***]	[0***]	[0***]	[0.146**]
EMP	-1.80	-1.01	0.16	-2.81	-5.34	0.18
Prob.	[0.38]	[0.74]	[0.146**]	[0.006***]	[0***]	[0.146**]
AGD	-2.52	-1.43	0.44	-1.08	-2.18	0.16
Prob.	[0.12]	[0.56]	[0.347*]	[0.72]	[0.03**]	[0.146**]
SEC	-1.84	-1.84	0.80	-3.04	-3.04	0.29
Prob.	[0.36]	[0.36]	[074***]	[0.003]***	[0.003***]	[0.347]
INF	-2.36	-1.64	0.18	-6.05	-6.12	0.15
Prob.	[0.159]	[0.453]	[0.146**]	[0***]	[0***]	[0.347]

Source: author's calculations

Notes: ** and *** denote statistical significance at 1% and 5% level respectively.

After ensuring that no variables are integrated into order two I (2), we may begin to analyse the long-term link between inequality and FD using the ARDL method.

5.2. Bounds test and the results of the long-run relationship

Besides unit root estimations, the second step in the ARDL approach is determining the optimal lag length based on the Akaike information criteria over other criteria (top 20 models). The optimal ARDL are (1, 1, 4, 3, 2, 0) and (1, 3, 0, 4, 3, 2) for model 1 and model 2 respectively.

Table 2 provides the bound test results when the GINIM (and GINID) as dependent variables are used, showing that the calculated F-statistic for both models is 14.472 and 13.801 respectively. These values are higher than the upper bound 5.598 (and 5.583) critical values reported in Pesaran et al. (2001) at the 99% significance level. Therefore, the null hypotheses of no cointegration for both models were rejected, and we accepted both alternative hypotheses.

Table 2. *The bounds test*

Model 1					Model 2				
Dependent Variable = GINIM					Dependent Variable = GINID				
Test Statistic	Value	Signif.	I (0)	I (1)	Test Statistic	Value	Signif.	I (0)	I (1)
F-statistic	14.472	10%	2.435	3.6	F-statistic	13.801	10%	2.44	3.6
k	5	5%	2.9	4.22	k	5	5%	2.9	4.22
		1%	3.96	5.58			1%	3.96	5.58

Source: author's calculations

Consequently, there is a long-run relationship between income inequality and the representative of the FD (CB, CRPB) and the representative of the FL (KOFF) variables and between income inequality and the control variables as well (EMP, AGD, SEC, and INF). This implies that the variables have a long-run equilibrium and thus tend to move together over time.

Table 3 shows that the long-run coefficients of the two models suggest a negative association between income inequality and FD variables, as expected. However, only when FD is measured as a domestic credit by banks as a share of the GDP in the long run does it have a significant effect on inequality, while the impact of credit to the private sector from all the sectors on inequality is insignificant. This means that only the changes in the ratio of credit to the private sector (% of GDP) from banks in Hungary are a matter of inequality in the long run. A one percentage point (hereafter, pp) increase in credit to the private sector by the banks will decrease GINIM by 0.086 pp. These findings are consistent with the findings of Back et al. (2007).

In terms of financial openness, the results confirm an inequality-widening hypothesis, and FL is positively associated with inequality in both models and is significant at a high level (1%). A 1 pp increase in FL will increase GINIM by 0.27 pp and GINID by 0.115 pp, according to the coefficients of the models. This result is in line with the finding of both Heimberger (2020) and Li and Su (2020), who reported that financial globalization and capital account liberalization have a considerable inequality-increasing impact.

Similarly, the control variable of the number of employees is positively associated with the market-based Gini index, but it is statistically insignificant. Contrarily, the

age dependency ratio has negative and significant influences on the disposable-based Gini index. A 1 pp increase in the age dependency ratio will decrease GINID by some 0.30 pp in the long run, which can be explained by family-friendly policies in Hungary. This finding contradicts the theory that predicts that the age dependency ratio increases income inequality, as well as the works of Dolls et al. (2019), Sun (2019), and Chen et al. (2018), who found that the age dependency ratio amplifies inequality.

The coefficient of education variable (school enrolment, secondary (% gross)) harms inequality but is insignificant in the long run in both models. Our result does not correspond with Hoi and Hoi (2013) and Batuo et al. (2010), who found that education enhances equality. Contrarily, the inflation index is associated positively with inequality measures, and a 1 pp increase in the inflation ratio will increase GINIM by 0.49 pp and GINID by 0.23 pp in the long run. Lower real wages and lower employment can explain the effect of inflation on inequality. This result is in line with the a priori expectation and economic theory and confirms the findings of Mookerjee and Kalipioni (2010), Zhang and Naceur (2019), Sehrawat and Giri (2015), and Bolarinwa and Akinlo (2021) but differs from the results of Park and Shin (2017).

Table 3. *Long-run estimation (dependent variable = income inequality)*

	Model 1			Model 2		
	Dependent Variable = GINIM			**Dependent Variable = GINID**		
Regressor	**Coefficient**	**T-ratio**	**Prob.**	**Coefficient**	**T-ratio**	**Prob.**
CB	-0.086	-2.403	0.023**			
CPNF				-0.004	-0.36	0.726
KOFF	0.269	3.56	0.001***	0.116	4.854	0***
EMP	0.001	0.53	0.598			
AGD				-0.297	-2.707	0.012**
SEC	-0.019	-0.37	0.718	-0.026	-0.756	0.456
INF	0.491	2.556	0.016**	0.232	4.857	0***

Source: author's calculations

Notes: ** and *** denote statistical significance at 1% and 5% level respectively.

5.3. Error correction model results

The empirical tests of the short-run coefficient estimate in *Table* 4 indicate that the speed of adjustment to restore equilibrium in the dynamic models is negative and significant at 1% level in both models. This provides further proof of the existence of a long-run relationship between the variables of the model (Narayan and Smyth,

2005). The value of the lagged error correction term in GINIM is -11.73 per cent each year in a long span of time, while it is -25.711 per cent in GIND. Hence, 11.73 percent of the change in GINIM (and 25.711 percent in GINID) is corrected every year towards its long-run equilibrium. The coefficients of (R2) are high in both models, which are 0.8913 and 0.8279 in model 1 and model 2 respectively.

The short-run estimations of the link between FD and inequality also support the initial findings obtained by the long-run regression. When FD is proxied by the ratio of credit to the private sector by banks, it improves income distribution, and an increase in the degree of FD by 1 pp leads to a decrease in the level of income inequality by 0.023 pp in the short run, which is statistically significant at 1%. Contrarily, the ratio of credit to the private sector by all the sectors will increase inequality, but this effect is insignificant. With further orders, however, the effects will be negatively and statistically significant.

Table 4. *Short-run and ECM analysis (dependent variable = income inequality)*

Model 1				Model 2			
Dependent Variable: D(GINIM)				Dependent Variable: D(GINID)			
Variable	**Coefficient**	**t-Statistic**	**Prob.**	**Variable**	**Coefficient**	**t-Statistic**	**Prob.**
Δ(CB)	-0.023	-2.878	0.007***	Δ(CPNF)	0.004	0.547	0.589
				Δ (CPNF (-1))	-0.0232	-3.246	0.003***
				Δ (CPNF (-2))	-0.0173	-2.354	0.026**
Δ(KOFF)	-0.035	-4.536	0.0001***	Δ(KOFF)	-0.0196	-2.129	0.04**
Δ (KOFF (-1))	-0.065	-7.195	0***	Δ (KOFF (-1))	-0.0467	-4.552	0.000***
Δ (KOFF (-2))	-0.0336	-3.856	0.0006***	Δ (KOFF (-2))	-0.023	-2.3173	0.028**
Δ(EMP)	-0.0002	-0.738	0.4662	Δ(AGD)	-0.0221	-0.2519	0.803
Δ (EMP (-1))	-0.0007	-2.339	0.0264**	Δ (AGD (-1))	0.0024	0.0188	0.985
Δ (EMP (-2))	-0.0007	-2.253	0.032**	Δ (AGD (-2))	-0.0788	-0.6056	0.55
Δ (EMP (-3))	0.0008	2.912	0.007***	Δ (AGD (-3))	0.2899	3.1006	0.004***
Δ(INF)	0.0146	1.693	0.1012	Δ(INF)	0.0143	1.4173	0.168
Δ (INF (-1))	-0.0198	-2.143	0.041**	Δ (INF (-1))	-0.034	-3.1173	0.004***
CointEq (-1) *	-0.1174	-10.089	0***	CointEq (-1) *	-0.257	-9.9066	0***
R-squared	0.8913	F-statistic	25.350	R-squared	0.828	F-statistic	11.839
Adjusted R-squ	0.856	Prob(F-sta)	0	Adjusted R-squ	0.758	Prob(F-sta)	0
Durbin-Watson	2.061			Durbin-Watson	1.510		

Source: author's calculations

Notes: ** and *** denote statistical significance at 1% and 5% level respectively.

The influence coefficient of KOFF on income inequality in the short run has opposite signs from that in the long-run equilibrium estimations, and their effects are still statistically significant in both models, but at different levels of impact and significance. Both Gini coefficients, GINIM and GINID, will increase by 0.035 pp and 0.020 pp, respectively, when the financial globalization index increases by 1 pp in the short run.

Regarding the control variables, the coefficient of the employment rate and age dependency rate variables are negatively associated with the coefficients of inequity, but results are statistically insignificant for these relationships. Similarly, the impact of inflation on inequality is statistically insignificant, but it has a positive relationship with inequality in both models. It should be noted, however, that the influence of both employment and inflation will be statistically significant with further orders, and raising the inflation or employment level leads to a decrease in inequality.

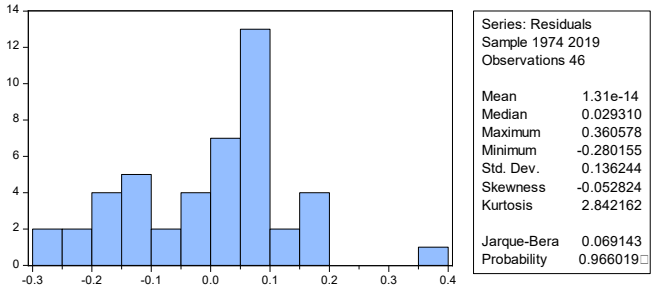
5.4. Results for the stability and diagnostic tests

The results of the various diagnostic tests were performed to check the fitness of the two models. The findings in *Table 5* demonstrate that the residuals of both models are devoid of serial correlation, and heteroscedasticity (all P values are more than the critical value of 0.05). In addition, the models have a normal distribution, as seen in *Fig. 2*.

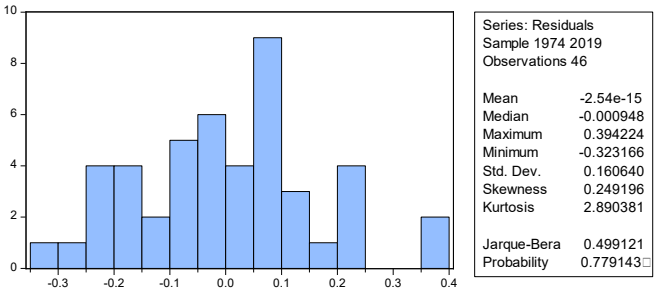
Table 5. *Residual tests*

	Model 1 – Dependent Variable: D(GINIM), ARDL (1, 1, 4, 3, 2, 0)				**Model 2 – Dependent Variable: D(GINID), ARDL (1, 3, 0, 4, 3, 2)**			
Breusch–Godfrey Serial Correlation LM Test:	F-statistic	0.017	Prob. F (2,27)	0.983	F-statistic	1.699	Prob. F (1,26)	0.21
	Obs*R-sq	0.06	Prob. Chi-Square (2)	0.971	Obs*R-squared	2.822	Prob. Chi-Square (1)	0.09
Heteroscedasticity Test: Breusch–Pagan–Godfrey	F-statistic	1.201	Prob. F (16,29)	0.324	F-statistic	2.094	Prob. F (18,27)	0.04
	Obs*R-squared	18.34	Prob. Chi-Square (16)	0.305	Obs*R-squared	26.801	Prob. Chi-Square (18)	0.08
Heteroscedasticity Test: ARCH	F-statistic	0.072	Prob. F (1,43)	0.789	F-statistic	0.974	Prob. F (1,43)	0.33
	Obs*R-squared	0.076	Prob. Chi-Square (1)	0.783	Obs*R-squared	0.997	Prob. Chi-Square (1)	0.31

Source: author's calculations



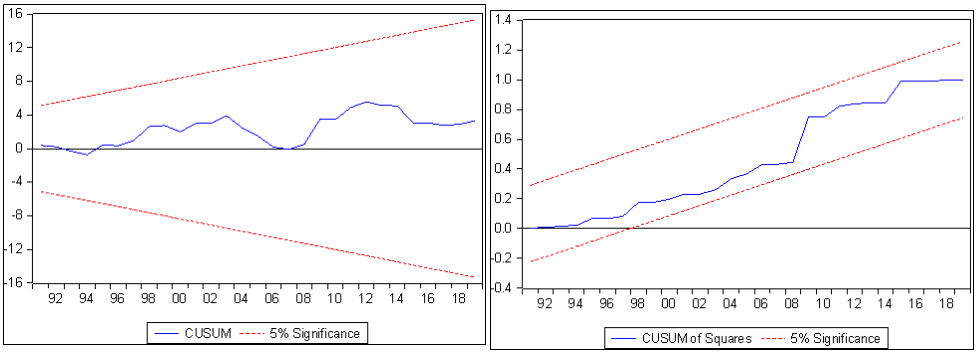
a. *Model 1 normality test*



b. *Model 2 normality test*

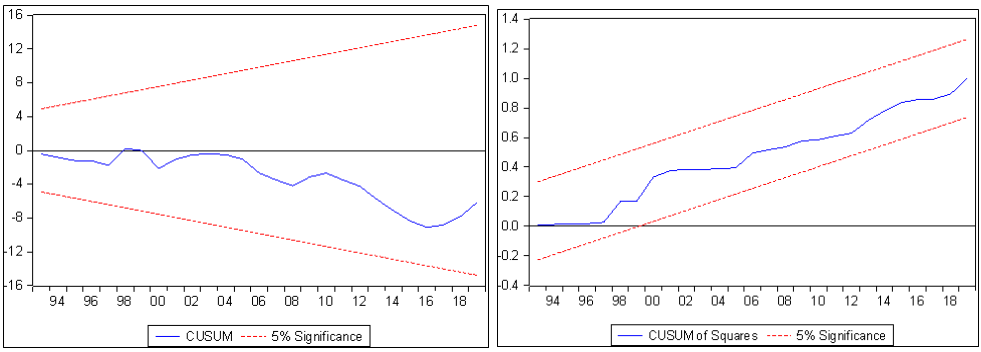
Figure 2. *Normality tests*

The study applied two tests to examine the stability of the ARDL models: the first one is the cumulative sum of recursive residuals (CUSUM) test, which is used to reveal whether there is a structural break in the series, and the second one is the cumulative sum of the squares of recursive residuals (CUSUMSQ) tests, which is used to reveal the date of a structural break, if there is one. *Fig. 3* shows that the two models are stable at 5% degree of liberty, considering that all wavy lines are between the straight lines.



a. *Model 1 ARDL (1, 1, 4, 3, 2, 0)*

Figure 3a. *Plots of the CUSUM and CUSUM sq. tests*



Note: The straight lines represent critical bounds at 5% significance level.

b. *Model 2 ARDL (1, 3, 0, 4, 3, 2)*

Figure 3b. *Plots of the CUSUM and CUSUM sq. tests*

6. Discussion and Conclusions

Economic theories provide conflicting predictions about the finance–inequality nexus, and discussing the findings of the empirical literature also yields mixed and inconclusive results. The endogenous growth theory gives weight to the inequality-narrowing hypothesis by finance, while recent research claims that finance could fall disproportionately on the wealthy (Rajan and Zingales, 2003; de Haan and Sturm, 2017). In particular, it improves intensive margins – and not extensive margins – and rent extraction (Stiglitz, 2016; Bolton et al., 2016; Piketty, 2014). Besides, FL and FD are often associated with more financial instability, which has devastating effects on inequality (de Haan and Sturm, 2017). From a Hungarian literature perspective, there is a strong paradox that emerges among empirical findings and is dominated by cross-country analysis. As a result, the current study seeks to provide new evidence on the relationship between FD and FL on income inequality, thus providing an efficient policy reference for the country's policymaking authorities.

Although Hungary's national development policies frequently state their intention to combat poverty and inequality, earnings and wealth inequalities seem to be increasing over the last thirty years. And finance is among the factors that contribute to shaping those inequalities directly or indirectly through different channels somehow or other. Those channels might be FDI, over-indebtedness, financial and economic crises, political money capturing, taxation, and redistribution. While the impact of FD and FL and related to FDI was noticeable in the second half of the 1990s, income distribution showed stagnation at first and then increased again. However, FDI inflows contribute to regional inequalities and income inequality because they are concentrated in a few areas and have a bias towards skilled and educated labour.

Results of the empirical test show that there is a relationship between FD and FL, with inequalities observable in the short and long run, and that financial openness leads to a decrease in Hungarian income inequality in the short run but increases it in the long run. Whereas the effects of FD on inequality vary according to financial indicators, credit to the private sector by banks improves income distribution in the short and long run, while credit from all credit sectors is insignificant. And the inflation index is associated positively with inequality measures in the long run. However, the change in the number of employees and education variables is not significant for income inequality.

Based on the discussion above and the empirical test results, the tendency towards FL raises inequality and financial instability. However, reducing the potentially unfavourable volatility distributional effects and ensuring that the advantages of more credit are shared more widely could take place through adopting policies that prevent volatility and the application of sound prudential policies and more stringent capital regulation.

Enhancing social safety nets and redistribution policies can redistribute income to the disadvantaged and reduce the potential passive effects of crises for the poor if they occur. However, high social benefits can negatively affect labour supply by reducing the incentives for work and employment. So, using active labour market policies is needed to limit these adverse effects, avoid skill mismatch, increase the minimum wage, expand the opportunities for young people, and enhance educational attainment and investment in skills such as providing apprenticeships and career training for the low-educated.

Another important conclusion about the finance–inequality nexus in Hungary is the issue of political capture because of a lack of quality at the institutional level. Money capturing is having control over the economic, monetary, and work policies that were financially beneficial to the wealthy, hence reducing economic and social equality and increasing wealth concentration at the top of the distribution ladder.

Accordingly, strengthening the building of oversight institutions will enhance the effective and efficient use of public funds and reduce the political capture of financial and economic policies. Besides, improving labour market institutions might allow employees to unite and bargain collectively for better pay and conditions, eliminating wage disparities between employees, boosting their protection, and putting an end to labour abuses. Finally, governance in progressive taxes aimed to enhance the redistributive potential of fiscal policy can play a pivotal role in addressing inequality, and changes in tax and transfer policies are needed.

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