

RETHINKING THE INCOME INEQUALITY AND FINANCIAL DEVELOPMENT NEXUS

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ABSTRACT

Financial crises have devastating effects in terms of income inequality. The recent financial crisis has provoked that inequality within advanced countries has returned to the prevailing levels of a century ago. In this article we look at the relationship between financial development and income inequality from a comprehensive perspective. Our hypotheses state that not only financial depth through credit expansion or capital markets activity matter in terms of income inequality, but also the financial system resilience. We look at a group of OCDE developed countries during the period 2000-2015 and the results confirm that in terms of credit provision there is a point of until which income inequality improves, but beyond this threshold further financial deepening will lead to a reverse effect, in line with the "*Too much finance hypothesis*". The role of capital markets exerts a widening income inequality effect while financial system resilience helps in alleviating existing income inequality. We recommend regulators and policymakers to pay more attention to financial depth variables, the behaviour of financial intermediaries and the environment in which they operate.

KEYWORDS: *Financial depth, resilience, income inequality, composite indicator, crisis, banking.*

INTRODUCTION

Since the pioneering studies of Blank and Blinder (1986) and Cutler and Katz (1991), there has been an academic consensus that recession leads to increases in inequality. The scant empirical evidence available seems to show that the negative impact of economic recessions on the situation of low-income households is considerably higher than the positive impact of the expansive phases of the economy (Hines *et al.*, 2001).

Financial crises have devastating effects in terms of income inequality because low-income households are the most vulnerable group to any shock that adversely affects the financial system and provokes a situation of credit rationing or even financial exclusion (Owyang and Shell, 2016). Malinen (2016) emphasizes the relevance of the channel of credit provision at the origin of crises in developed economies. The financial crisis that started in 2008 provoked the return of inequality in advanced countries to levels typical of a century ago. Income inequality has increased in recent years, especially in advanced economies (Haan and Sturm, 2017).

Recent studies present arguments linking income inequality to the financial crash. Some authors support the view that the “financialization process” experienced over the last decades decisively contributed to the global financial crisis, questioning Schumpeter’s statement that financial deepening generally stimulates economic development (Kus, 2012:6). The relative importance of income from private properties and capital investments has substantially increased over the last decades, especially in the case of rich families (OECD 2011, p.35). As Piketty (2014) argues, this wealth disparity is the main reason for the existing income gap and has raised concerns about its economic and social consequences.

On these grounds, the debate about the impact of financial systems has been reopened to analyze whether there is an optimal degree of financial depth beyond

which there are no more positive benefits in terms of growth and investment but still significant costs in terms of inequality, financial fragility and macroeconomic instability.

Cihak *et al.* (2012) highlight the multidimensional nature of financial systems and show that if we focus on only one characteristic – for example, financial depth or financial stability – this approach would be too narrow and miss important characteristics of the dynamics of modern financial systems.

In this article, we try to determine whether there is any relationship between the financial system and income inequality. We try to answer three questions: i) does financial depth (through credit or market capitalization) affect income inequality?; ii) is the resilience of the financial system relevant to inequality? and iii) what is the relationship between these variables and inequality (linear or nonlinear)? To answer these questions, we carry out a panel data analysis for a group of nine OECD advanced economies during the period 2000-2015.

The empirical results confirm that too much finance leads to greater inequality, while financial system resilience reduces inequality. This paper emphasizes the need for policy makers to closely monitor financial intermediaries' behavior to ensure that the overall financial system plays a positive role in terms of income inequality.

Our paper contributes to the scarce literature about the specific relationship between financial development and income inequality in developed countries by simultaneously considering the quantitative importance of the financial system (based on financial depth ratios) and the multidimensional nature of financial system resilience.

The paper is organized as follows. The second section reviews the literature and establishes different hypotheses for analysis. The third section describes the sample, variables and methodological issues. The empirical results are presented in the fourth section. The paper ends with some concluding remarks.

2. THEORETICAL DISCUSSION AND EMPIRICAL EVIDENCE

2.1. FINANCIAL DEPTH (CREDIT PROVISION) AND INCOME INEQUALITY.

Traditionally, Demirgüç-Kunt and Levine (2009) have identified three types of links between inequality and financial systems: an extensive link (through wider financial access), an intensive link (through improved quality of services for those who are already included in the financial system) and an indirect link (through the labor market).

Credit provision affects inequality because it benefits corporate access to finance, so the extent to which the low-income group can benefit from this source of finance will result in lower levels of income inequality. The provision of credit to households will foster consumption levels based on low-income families' higher marginal propensity to consume. The higher consumption is, the higher the aggregated output of a country and the higher the levels of employment. If the new labor demand is for low-skilled profiles, the poor will enjoy better chances to find a job, contributing to lower levels of inequality (ECB, 2018). Overall, higher credit availability allows households to make decisions based on the efficient allocation of spending over time, regardless of their inherited wealth.

Among the advocates of this narrowing effect of financial depth on income inequality Banerjee and Newman (1993) argue that more-developed financial systems lead to reductions in income inequality because in the presence of market imperfections, people can borrow only limited amounts.

Finance-induced growth may be pro-poor by expanding employment opportunities, but it may also favor entrepreneurs and their profit margin. It usually brings relatively larger benefits to those at the lower end of the income distribution (Beck *et al.*, 2007; Beck *et al.*, 2010).

However, in the opposite direction, some studies have found a widening impact of financial depth in terms of income inequality. This effect seems especially clear in advanced economies and in recent years (Kim and Lin, 2011; Jaumotte *et al.* 2008, Haan and Sturm, 2017).

One channel through which the widening of income inequality takes place is the easy access to finance that ultimately leads to a situation of overindebtedness.

Iacoviello (2008), Rajan (2012) and Kumhof and Rancière (2010) confirm this statement and find that excessive levels of indebtedness are responsible for the persistent income inequalities in the U.S.

Roberts and Kwon (2017) show that the relationship between the financial system and income inequality is greater in countries with weak collective bargaining, little labor protection and shareholder corporate governance, commonly referred to as liberal market economies (LMEs).

More recent theoretical models analyze the ways in which the financial system can increase income inequality by allowing larger rent extraction (Brei *et al.*, 2018), i.e., the booming remuneration of senior executives and the proportion of salaries to the total income (Dünhaupt, 2013). The financialization process (Kwon and Robert, 2015), with the rising dominance of financial instruments and financial actors (Flaherty, 2015), appears to be a factor behind the increase in inequality in OECD countries.

Some authors considering nonlinear patterns find an inverted U-shaped relationship (Greenwood and Jovanovic, 1990) between financial depth and inequality, with a turning point that occurs when the credit to the private sector reaches 114% of GDP (Nikoloski, 2012) or 82% of GDP (Jauch and Watzka, 2016). This is called a detrimental-to-beneficial pattern (Brei *et al.*, 2018: 6).

However, in tune with the “too much finance hypothesis” (U-shaped pattern), some studies have found that although in the early stages of financial development, the role played by the financial system is positive and contributes to narrowing the income-inequality gap, there is a threshold beyond which further financial deepening will lead to a reverse effect, and inequality will start to rise (Tan and Law, 2012;Loayza *et al.*, 2018).

2.2. FINANCIAL DEPTH (CAPITAL MARKETS) AND INCOME INEQUALITY.

Regarding the relationship between capital markets and income inequality, the literature reviewed shows that the emergence of a new corporate governance view with an increasing focus on short-term profits gives firms the incentive to cut labor costs while rewarding the top executives who make such decisions, thus fostering income inequality (Kus, 2012:9). In addition, as stock prices increase, the gains are disproportionately distributed to the wealthy, thereby further widening the unequal distribution of income (Atkinson, 2013; Owyang and Shell,

2016; Li and Owyang, 2018). Income inequality is also likely to deepen when a stock bubble bursts. At the beginning of a boom, the investors entering the stock markets tend to have high income and benefit more from the abnormal returns. Later investors entering the market have low or medium income, so they suffer more severe losses when the bubble bursts (Kus, 2012). Asteriou (2014) finds that stock market capitalization has been the driving force of inequality in the EU-27 since 1995, and Neagu *et al.* (2016) reach the same conclusion for Eastern and Central European countries during 2000-2014. Jeong and Kim (2018) argue that the effects of capital markets on inequality are only weakly positive and short-lived.

Another stream of the literature finds that the relationship between capital markets and income inequality is better captured when nonlinear dynamics that follow a U-shaped (Nasreddini and Mensi, 2016; Brei *et al.*, 2018) or inverted U-shaped pattern (Mathew, 2008) are considered.

2.3. FINANCIAL SYSTEM RESILIENCE AND INCOME INEQUALITY.

Some authors find significant evidence in favor of a positive relationship between financial fragility and income inequality in developed countries during the period 1995-2015 (Amountzias, 2019). Financial fragility is the opposite of financial resilience, a term that has entered the debate among academics and policymakers in OECD countries (Kambhu *et al.*, 2007).

Bakir (2016) defines financial system resilience as the capacity of the financial system to adapt in response to both short-term shocks and long-term changes while continuing to fulfil its functions in serving the real economy (Holling and Gunderson, 2002: 27-28). Financial resilience refers to the behavior of financial intermediaries (De la Cuesta *et al.*, 2015), the specific environment in which they operate (Duisenberg School of Finance, 2015; UNEP, 2015) and some underlying institutional factors (Bakir, 2016).

Ruza *et al.* (2019) review the main studies analyzing and measuring resilience and propose a theoretical and comprehensive framework of financial resilience. They define financial resilience as the capacity of a system not to return to an initial point of equilibrium after a shock but to evolve and move to a new state of equilibrium within a stability domain. Inspired by the New Economics Foundation (2015), the authors summarize the main determinants of financial resilience: the

business model followed by banking institutions (asset and liability composition); the structure of the market in which banks operate and the institutional environment and policies that influence banking behavior. These determinants can help prevent, attenuate or amplify shock propagation, impose limits and influence agents' incentives to engage in risky activities.

In this paper, we assume that financial system resilience can contribute to reducing financial fragility and thus reduce income inequality levels (Amountzias, 2019).

Therefore, considering the contradictory results presented in the literature, we establish the hypotheses shown in Table 1.

3. DATA AND ESTIMATION METHOD

3.1. SAMPLE, SOURCE OF INFORMATION AND VARIABLES

Our sample includes Canada, France, Germany, Italy, Japan, the U.K., the U.S., Spain and Portugal. The analysis extends over a period of 16 years (2000-2015), so it covers the pre-crisis and post-crisis periods to reveal any significant differences in the patterns.

Previous studies have often used the Gini coefficient to measure income inequality, either in gross or in net terms. In our study, we decided to include the net Gini as our dependent variable, defined post-tax and post-transfers, so it captures the effect of public redistributive instruments. To do so, we used Solt's Standardized World Income Inequality Database (2009), which seems to be the most comprehensive and comparable database of Gini indices among developed countries over time.

We introduce two exogenous variables to measure financial depth. The first is the credit provided to the private sector as a percentage of GDP (CREDIT), which reflects the ease with which households and corporations may obtain credit (Rajan and Zingales, 2003; Demirgüç-Kunt and Levine, 2009; Jauch and Watzka, 2016).

The second variable, stock market capitalization as a percentage of GDP (MKCAPITAL), accounts for the increasing importance of financial markets for

generating capital gains and improving agents' financial wealth (Tan and Law, 2012; Antonelli, *et al.*, 2014; Bengtsson and Waldenström, 2018).

To measure the resilience of the financial system (RESILINDEX), we follow the methodology proposed by Ruza *et al.* (2019) and construct a new composite index. The variables included in the index are those correlated with inequality and according to the sign of this relationship. These variables refer to the way in which banks do business, reflected in their asset and liability composition (leverage, broad noncore liabilities, credit allocation, inter-financial activity and international exposure), the structure of the market in which they operate (bank asset size and bank concentration) and other characteristics of the financial system influenced by policies and institutional factors (securitization exposure and level of household debt).

Drawing on previous studies, we identify various control variables to account for other important drivers that might influence income inequality:

- **Ln GDP per capita** (LnGDP pc). This variable is included to test whether the Kuznets hypothesis (1955) holds within the group of advanced economies. This hypothesis suggests that the relationship between economic development and income inequality follows an inverted U-shape.

- **Public expenditure on health** (GEXHEALTH). Equality of opportunity refers to the access to basic health services and the public investments in human assets, such as health, that may augment the productivity of a country and enhance the earnings capacity of its population (Lindert, 2016).

- **Country classification** (COUNCLASS). In line with Antonelli *et al.* (2014) and Rehbein and Souza (2014, p. 20), the model of capitalism that characterizes a specific country affects the level and the dynamics of inequality. From the perspective of the varieties of capitalism proposed by Hall and Soskice (2001), capitalist countries can be divided into LMEs and coordinated market economies (CME). LMEs provide stronger shareholder and creditor protection, so they usually promote a market-based model, and the repeated interaction of banks can compensate for reduced creditor protection (Brei *et al.*, 2018).

- **Banking crisis time** (CRISTIME). This is a dummy variable. Following the definition of the World Bank, a banking crisis occurs if the following two criteria

are observed: a) significant signs of financial distress in the banking system and b) significant banking policy intervention. The first year in which both criteria are met is considered the start of the crisis (2008), and the crisis ends when both real GDP growth and real credit growth turn positive for two consecutive years.

Our unbalanced panel of data consists of nine cross-sections and ten time series over 16 years.

Table 1. Definition of variables and sources of information.

DEPENDENT VARIABLE			
Net Gini (GINI)	Net Gini Coefficient (post-tax, post-transfer)		
	Source: Standardized World Income Inequality Database (SWIID). (Solt, 2016).		
EXPLANATORY VARIABLES			
VARIABLE	DEFINITION	HYPOTHESES	EXPECTED SIGN
Financial depth (CREDIT)	Private credit by deposit banks and other financial institutions to GDP (%) Source: Global financial development database, World Bank (2017).	H1.a: Credit provision has a negative and significant impact on income inequality. H1.b: Credit provision has a positive and significant impact on income inequality. H1.c: There is an inverted U-shaped relationship between credit provision and income inequality. H1.d: There is a U-shaped relationship between credit provision and income inequality.	Negative Positive Linear term positive and quadratic term negative. Linear term negative and quadratic term positive.
Financial market capitalization (MKCAPITAL)	Stock market capitalization to GDP (%) Source: Global financial development database, World Bank (2017) and Fed Reserve Bank of St. Louis.	H2a: Financial markets' capitalization has a positive and significant impact on income inequality. H2b: There is a nonlinear relationship between financial markets' capitalization and income inequality.	Positive Quadratic term.
Financial system resilience (RESILINDEX)	Composite Index of Resilience Source: Ruza <i>et al.</i> (2019) and own elaboration.	H3: Financial system resilience has a negative and significant impact on income inequality.	Negative

Source: Own elaboration.

Table 2. Control variables

VARIABLE	DEFINITION	SOURCE
Ln GDP per capita (Ln GDP pc)	Neperian logarithm of GDP per capita, constant 2010 US\$	World Development Indicators database, World Bank (2017).
Public expenditure on health (GEXHEALTH)	Government's current expenditure on health to GDP (%)	OECD statistics (2017).
Country classification (COUNCLASS)	Classification of liberal market economies (LME) and coordinated market economies (CME).	Hall and Soskice (2001).
Banking crisis time (CRISTIME)	Dummy variable (0 for years before 2008; 1 for 2008 and the following years)	Global Financial Indicators, World Bank (2017).

Source: Own elaboration.

3.2. METHODOLOGY

The financial system's resilience index used as an explanatory variable is defined on a scale between 0 and 100 following the methodological procedure proposed by OECD (2008).

The base variables (see Table 3) are normalized by applying the minimum-maximum method and considering the sign of the relationship between each variable and resilience. For the weighting and aggregation of the base variables, we choose the STATIS technique, and we use the ACT program included in the statistical package SPAD. This is a multivariate technique that is used for analyzing multiple matrices or tables of data consisting of continuous variables. There are as many matrices as there are years, and each matrix is composed of the base variables of the nine countries (end of the year references). The relationships between successive matrices are studied to construct a "compromise matrix" through scalar products that is as close as possible to and representative of the original matrices.

Accounting for the weights assigned to each annual matrix, we organize the pooled data and apply principal component analysis with Varimax rotation. Three dimensions are identified and retained, which accounts for 75% of the explained variance (Table 3).

Table 3: Principal component analysis with Varimax rotation

Factor loadings after Varimax rotation			
Variables*	D1	D2	D3
Market concentration	.180	-.446	.615
Inter-financial linkages	.374	.818	.126
International exposure	.739	-.062	.442
Banking system size	.908	.284	.105
Households' debt	.051	.749	-.256
Credit allocation	.661	-.131	.579
Broad non-core liabilities	.707	.046	-.162
Securitization	.115	-.024	-.925
Leverage	.863	.328	-.020
Variance (%)			
Cumulated variance (%)	35.998	18.237	20.924
	35.998	54.235	75.159

Source: Own elaboration.

* Variable definitions can be found in Ruza *et al.* (2019).

The index of financial system resilience for each country and year with linear aggregation is calculated according to the following equation:

$$\text{Resilience composite index (RESILINDEX)} = \sum_{i=1}^3 FS_i * w_i \quad (1)$$

where FS_i is the factor score of each selected component or dimension ($i= 1,2,3$).

FS_i is calculated from the base variables for each country and year, weighted by the factor loadings obtained after the Varimax rotation; and w_i is the percentage of variance explained by each component or dimension i .

The composite index obtained measures the financial system resilience. The index is standardized on a scale of 0 to 100, from lower to higher resilience, for the interpretation of subsequent empirical results.

According to H1, H2 and H3, the general empirical model for econometric estimation is set as:

$$\begin{aligned}
GINI_{it} = & \alpha + \beta_1 CREDIT_{it} + \beta_2 CREDIT_{it}^2 \\
& + \beta_3 MKCAPITAL_{it} + \beta_4 MKCAPITAL_{it}^2 + \beta_5 RESILINDEX_{it} \\
& + \beta_6 LnGDPpc_{it} + \beta_7 GEXHEALTH_{it} + \beta_8 COUNCLASS_{it} \\
& + \beta_9 CRISTIME_{it} + \varepsilon_{it}
\end{aligned}
\tag{2}$$

where the variables for each country i in year t correspond to the definitions provided in Tables 1 and 2, β are the coefficients or parameters and ε are random errors.

We obtain descriptive statistics and bivariate Pearson correlations. Following the Fisher test and cointegration test for panel data, most of the series appear to be nonstationary but cointegrated. The Granger test reveals no causal relationships, and none of the explanatory and control variables show problems of endogeneity, except the GDP per capita variable¹. The Pesaran test for cross-sectional dependence allows us to accept the null hypothesis of cross-sectional independence. Finally, the Arellano-Bond (1991) and Woodridge (2002) tests identify serial autocorrelation, and the Pagan-Hall, White/Koenker and Breusch-Pagan/Godfrey/Cook-Weisberg tests detect heteroskedasticity.

The econometric tests suggest that we not include the dependent variable with one lag as the explanatory variable because the model specification produces biased estimates. Plausible explanations for the potential bias are the small size of the sample, the strongly autocorrelated residuals and the nonstationarity of the dependent variable (Bellemare *et al.*, 2017).

To address serial autocorrelation, we start with the following specification of the econometric model with all quantitative independent variables lagged one period:

$$\begin{aligned}
GINI_{it} = & \alpha + \beta_1 CREDIT_{it-1} + \beta_2 CREDIT_{it-1}^2 \\
& + \beta_3 MKCAPITAL_{it-1} + \beta_4 MKCAPITAL_{it-1}^2 + \beta_5 RESILINDEX_{it-1} \\
& + \beta_6 LnGDPpc_{it-1} + \beta_7 GEXHEALTH_{it-1} + \beta_8 COUNCLASS_{it-1} \\
& + \beta_9 CRISTIME_{it-1} + \varepsilon_{it}
\end{aligned}
\tag{3}$$

Since the independent variable $LnGDPPc_{it-1}$ is endogenous, it is instrumented in the estimations by its lagged values $t-2$.

Model (3) is first estimated with individual random effects applying generalized least squares in two stages. The results are the same for two-stage OLS. Random effects do not appear to be relevant, and we do not include them in the following estimation.

We then estimate the model by applying the generalized method of moments (two-step efficient GMM estimator) with small sample correction (Baum *et al.*, 2010). The empirical results obtained include standard errors that are robust to arbitrary heteroskedasticity and autocorrelation.

The validity of the instrument is tested by the Lagrange multiplier (LM) and Wald robust versions of the Kleibergen-Paap (2006) rk statistic and an LM test for redundant excluded instruments.

4. RESULTS AND DISCUSSION

Tables 4 and 5 show the descriptive statistics and bivariate correlations among the quantitative variables included in the study. They reflect that the sample is very homogeneous in terms of GDP per capita and inequality (all countries are advanced economies), but not in terms of credit provision, stock market capitalization and financial resilience.

We find a high correlation between credit provision and stock market capitalization but low correlations between the resilience index and the rest of the independent and control variables. Credit provision is the only variable that shows a positive relationship with GINI. We find a strong negative correlation between the resilience index and GINI.

Table 4: Descriptive statistics (quantitative data):

Variable	Observations	Minimum	Maximum	Mean	Standard deviation
GINI_COEFFICIENT	137	26.700	37.800	32.285	2.826
CREDIT	137	59.872	202.200	131.376	40.422
MKCAPITAL	137	21.320	171.214	78.225	36.078
RESILINDEX	137	0.000	100.000	50.838	24.901
LnGDPPc	137	9.963	10.854	10.528	0.237
GEXHEALTH	137	4.770	9.420	6.957	1.131

Source: Own elaboration.

Table 5: Bivariate Pearson correlation matrix (quantitative data)

	CREDIT	MKCAPITAL	RESILINDEX	LnGDPpc	GEXHEALTH	GINI_COEFFICIENT
CREDIT	1	0.494	0.008	0.209	-0.117	0.434
MKCAPITAL	0.494	1	0.002	0.516	-0.179	0.297
RESILINDEX	0.008	0.002	1	0.059	0.130	-0.520
LnGDPpc	0.209	0.516	0.059	1	0.413	-0.241
GEXHEALTH	-0.117	-0.179	0.130	0.413	1	-0.429
GINI_COEFFICIENT	0.434	0.297	-0.520	-0.241	-0.429	1

Source: Own elaboration.

Table 6 shows a summary of the model estimation results for the period 2000-2015).

We find nonlinear dynamics following a U-shaped pattern in the credit provision-inequality nexus and the stock market capitalization-inequality nexus, confirming H1d and H2b. In both cases, there is a threshold beyond which further financial deepening will lead to a reverse effect, which highlights the existence of a trade-off between greater financial depth and greater risk of crisis, confirming the too much finance hypothesis (Tan and Law 2012; Brei *et al.* 2018; and Nasreddini and Mensi, 2016). The turning point corresponds to credit to the private sector amounting to 114.33% of GDP and stock market capitalization amounting to 66.85% of GDP.

With regard to the resilience index, the negative impact on income inequality confirms our H3. Income inequality is comparatively lower in countries with less household indebtedness, a higher volume of outstanding securitization and banking systems that are less concentrated, more capitalized and with diversified liabilities but with lower international exposure and inter-financial dependence. The impact of resilience on reducing inequality would be higher if the credit allocation to the private sector were effectively used to finance more productive projects.

We also find, as expected, that income inequality is higher in LMEs, i.e., weak collective bargaining, little labor protection and few stakeholder-orientated firms.

Finally, when we control for LnGDP per capita, banking crisis and government expenditure in health, we find that these factors also affect income inequality with the expected signs.

Table 6: Summary of model estimation results

Dependent variable: GINI_COEFFICIENT	<i>Two-step GMM estimator</i>
Explanatory variables (lagged one period)	<i>Coefficient/(standard error)</i>
CREDIT	-0,087807*** (0,029832)
CREDIT ²	0,000384*** (0,000113)
MKCAPITAL	-0,051077*** (0,018442)
MKCAPITAL ²	0,000382*** (0,000132)
RESILINDEX	-0,047476*** (0,005298)
LnGDPpc(ln)	-6,554073*** (0,873188)
GEXHEALTH	-0,310815** (0,146843)
COUNCLASS	2,846809*** (0,556353)
CRISTIME (0≤2008; 1>2008)	1,049639*** (0,288461)
Constant	110,055158*** (9,609550)
N	120
Adjusted R²	0,826090

Significance: .01 - ***; .05 - **; .1 - *

Source: Own elaboration.

5. CONCLUSIONS

The most recent financial crisis has raised the debate surrounding the income inequality and financial development nexus. Our paper analyzes this relationship in developed countries for the pre- and post-crisis periods.

Our results confirm the too much finance hypothesis concerning credit provision and market capitalization. This could suggest that the excessive credit as a percentage of GDP before the 2008 financial crisis resulted in overindebtedness and the deflation of assets in the nine OECD countries analyzed and that low- or medium-income investors suffered more severe losses when the bubble in the capital market burst. This confirms that a financial bubble, with an overheated and rapidly growing economy, do not take into consideration its impact on inequality. We also find that better financial resilience contributes to reducing

income inequality, revealing that attention should be paid to some structural, behavioral and institutional components of the financial system.

Our paper has two main methodological contributions. On the one hand, we propose a model that simultaneously considers two explanatory variables measuring financial depth (credit provision and capital markets). On the other hand, we introduce a multidimensional variable (financial system resilience), which accounts for a deeper assessment of the financial system from a multidimensional perspective.

According to our results, not only the depth of the financial system but also a wide array of financial variables should receive attention, especially in liberalized economies. Financial policies aimed at reducing income inequalities must jointly consider the impact of credit provision, capital markets and the resilience of the financial system overall.

Policymakers should promote regulatory reforms that render the financial system more robust to destabilizing shocks (Tsagkanos, 2017) and control and supervise the business model to ensure that, in the end, financial activity contributes to a more equal distribution of income.

To enrich these conclusions, future research should introduce more countries into the sample, consider new variables and analyze the reverse relationship of how inequality might affect financial depth and resilience.

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ⁱ According to the Durbin-Wu-Hausman and C statistics for the null hypothesis of exogeneity.