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## The effect of financial derivatives on wealth inequality

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## ABSTRACT

This paper explores the relationship between financial derivatives and wealth inequality. While previous studies have acknowledged a connection between finance and inequality, the precise nature of this relationship remains uncertain. Our study aims to contribute to this discourse by isolating the impact of financial derivatives on wealth distribution, controlling for other financial factors. Using data for 15 countries from 2001–2021, we examine the relationship of exchange-traded derivatives from the Bank of International Settlements and pre-income tax wealth Gini coefficients for adults from the World Inequality Database. Employing panel econometric techniques and controlling for country fixed effects, we analyze the dynamic relationship between these variables. Contrary to conventional financial theory, which often views derivatives as redundant assets, our findings reveal a positive, significant and robust association between wealth inequality and the use of derivatives. This challenges prevailing assumptions and underscores the importance of derivatives in shaping global wealth distribution dynamics.

## 1. Introduction

Wealth inequality has become a critical issue in economic discourse, with its rise posing significant economic and socio-political challenges.<sup>1</sup> While there is extensive research on income inequality, wealth inequality remains less explored, largely due to challenges in data availability. Unlike income data, which is easily accessible through administrative tax records, wealth data is harder to obtain, and indirect estimation methods vary in accuracy across countries. However, recent advances by Piketty and Goldhammer (2014), Saez and Zucman (2016) have improved wealth estimation methodologies, allowing researchers access to higher quality data and enabling further studies on wealth inequality. This enhanced understanding of the wealth distribution has facilitated the examination of the role of finance not only in shaping income but also the distribution of wealth.

While extensive research explores the impact of finance on income inequality—ranging from financial liberalization (Abiad and Mody, 2005; Abiad et al., 2010) to financial development (Banerjee and Newman, 1993; Beck et al., 2007)—its specific influence on wealth distribution remains inadequately understood, despite some emerging studies in this area. Frost et al. (2022) identify a relationship between financial development, financial technology, and wealth inequality but their study is focusing only on Italy. They find that these factors positively influence household financial wealth and returns, although this association weakens toward the end of their sample period. Additionally, the relationship between specific financial variables and wealth inequality during financial crises

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appears to be multi-layered. While financial crises might intuitively seem to directly affect wealth distribution, empirical findings suggest this is not necessarily the case. For example, Grabka (2015), in a study on Germany, finds no direct link between the Great Financial Crisis and changes in wealth distribution—a conclusion supported by Shchepeleva et al. (2022) with the implementation of international data. Interestingly, the influence may run in the opposite direction; high levels of wealth concentration can foster financial instability and excessive risk-taking, as noted by Goda et al. (2017) and more recently by Garcia and Panetti (2022). Although crises may not directly affect the distribution of wealth, post-crisis monetary policies often indirectly exacerbate inequality through asset price inflation (Mumtaz and Theophilopoulou, 2020).

Furthermore, applying the insights from income inequality research to the study of wealth inequality is challenging due to the distinct mechanisms forming each of the distributions (Benhabib et al., 2017; Kuhn et al., 2017; Black et al., 2023). While some scholars suggest a link between income inequality and wealth distribution (Osakwe and Solleder, 2023; Durand and Murtin, 2015), others, like Welch (2001), argue that this relationship is complex due to the nuanced nature of income dispersion and savings behavior. Given this complexity, it is crucial to explore specific financial instruments, such as derivatives, or portfolio composition and heterogeneity (Xavier, 2021) that may uniquely influence the wealth distribution.

This highlights a significant gap in the literature: the underexplored role of derivatives in wealth inequality. Despite the immense scale of the derivatives market, estimated at \$730 trillion (Bank of International Settlements, 2024)<sup>2</sup>, and their capacity to impact wealth distribution through mechanisms such as leverage and hedging, the influence of derivatives remains largely unexamined in this context.

In our study, we quantify the relationship between financial derivatives and wealth inequality, and we intend to capture the economic significance that derivatives have on the wealth distribution. We are using data from exchange-traded derivatives across 15 countries between 2001 and 2021. Wealth inequality is measured using the Gini coefficient from the World Inequality Database (WID), while derivatives are proxied by the turnover notional amount from the Bank of International Settlements database. We also control for financial development, financial liberalization, economic uncertainty, trade, foreign direct investment (FDI), stock market capitalization and other macroeconomic indicators—factors that capture both the speculative and hedging roles of derivatives within broader economic contexts. Given the lack of a solid theoretical foundation, we adopt an empirical approach similar to studies on income inequality, following the work of Beck et al. (2014), De Haan and Sturm (2017), and Brei et al. (2023).

We employ a panel fixed effects estimator to account for unobservable country-specific factors, alongside a dynamic model to address the time-lagged nature of derivatives transactions and financial policies. This approach helps mitigate endogeneity issues, enhancing the robustness of our analysis.

Our study makes two key contributions to the literature. First, we investigate the previously unexplored relationship between financial derivatives and wealth inequality. Second, we utilize a more contemporary dataset from 2001 to 2021, allowing us to capture recent economic changes in wealth inequality that older studies may have overlooked.

Our findings indicate a significant positive relationship between derivatives and wealth inequality, challenging the notion that financial derivatives are redundant assets.

## 2. Data and methodology

We measure wealth inequality using the Wealth Gini from the World Inequality Database using the ‘equal-split adults’ series, which allows for comparability of inequality across time and across countries. The ‘equal-split adults’ series, distribute income to all adult individuals, while splitting income equally between a couple or a household.<sup>3</sup> This wealth distribution is derived from tax and inheritance data, following Atkinson and Harrison’s (1974) methodology, and extends WID’s comprehensive database on income inequality. The resulting dataset spans from 1800 to 2022, offering extensive observations that strengthen our methodological approach. While we considered using Credit Suisse Wealth reports, as Hasan et al. (2020) did, we opted for WID due to its broader temporal coverage, which is advantageous given the limited availability of derivatives data. The Gini coefficient, ranging from 0 (full equality) to 1 (complete inequality), serves as our measure of wealth inequality. While other methods exist, the Gini provides an easily applicable summary measure for econometric modeling. However, it does have limitations, notably its inability to reflect changes within specific wealth quartiles. Despite this, the Gini remains an effective tool for capturing overall wealth dispersion across the population in our analysis.

We approximate derivatives in the economy by the nominal value of exchange traded derivatives, as reported by the Bank of International Settlements Exchange-Traded Derivatives database.<sup>4</sup> Although over the counter (OTC) derivatives represent a larger

<sup>2</sup> OTC derivatives statistics at end-June 2024, [https://www.bis.org/publ/otc\\_hy2411.htm](https://www.bis.org/publ/otc_hy2411.htm).

<sup>3</sup> Distributional National Accounts Guidelines, Methods and Concepts Used in Wealth Inequality Database (2024). <https://wid.world/document/distributional-national-accounts-guidelines-2020-concepts-and-methods-used-in-the-world-inequality-database/>

<sup>4</sup> All derivative values are expressed in millions of US dollars, and they represent turnover notional amounts (daily average).

portion of the market, their data availability, accounting consistency, and transparency are significantly lower compared to exchange-traded derivatives. Therefore, we have decided to exclude them from our analysis. Although data availability for OTC derivatives is limited, we utilized the available information to estimate the correlation between exchange-traded and OTC derivatives. The observed correlation ranges from 0.52 to 0.71, depending on the risk source (interest rate and foreign exchange) and instrument type (futures and options). This suggests that exchange-traded derivatives serve as a reasonable proxy for representing the overall derivatives market and are suitable for examining their impact on wealth distribution. This approach aligns with our objective of assessing the potential effects of derivatives presence in the economy on wealth inequality. According to the Bank of International Settlements, the nominal value of derivatives is the sum of absolute values of all outstanding derivative contracts with either positive or negative replacement values, that are not yet settled on the delivery day. Although notional value doesn't indicate the value or the volume of the derivatives that will be exercised, yet it supplies information about the potential scale of market risk and of the associated financial transfer risk that it's taking place. This is precisely the information we aim to capture in evaluating the economic significance of derivatives on wealth inequality across markets, countries, and time.

Our main control variables include Trade, FDI, Stock Market Capitalization, Financial Development<sup>5</sup>, Financial Liberalization, and the Economic Uncertainty Index,<sup>6</sup> consistent with literature highlighting their role in shaping wealth and income distribution. Additional controls are unemployment rate, gross savings as a percentage of GDP, GDP growth, inflation, population growth, and political globalization. Data for Trade, FDI, Stock Market Capitalization, Unemployment, GDP, Inflation, and Population are from the World Development Indicators (World Bank). Financial Liberalization is measured using the De Haan et al. (2017) index, derived from Fraser Institute data, based on financial openness, credit market regulation, black market exchange rate spreads, and the right to hold foreign currency accounts. The Sviryzdenka (2016) IMF index captures Financial Development, accounting for financial access, efficiency, and depth. Economic Uncertainty is assessed using the Ahir et al. (2022) index, reflecting global uncertainty levels reported in the Economic Intelligence Unit. Lastly, political globalization is represented by the KOF Economic Institute index as a proxy for political openness.

The main specification of our model is the panel regression:

$$Wealth_{i,t} = \beta_0 + \beta_1 Derivatives_{i,t-1} + \beta_2 FinancialDevelopment_{i,t-1} + \beta_3 FinancialLiberalization_{i,t-1} + \beta_4 X_{i,t} + \eta_i + \epsilon_{i,t} \quad (1)$$

Our dataset is unbalanced because derivatives data coverage varies, as not all countries adopted or gained access to derivatives at the same time. However, all countries have at least 6 observations. Fixed effects estimation can effectively handle this unbalanced structure, especially as we control for factors influencing derivative use, such as financial development, financial liberalization, Trade, and FDI. There are three main reasons for using lagged independent variables in the study of wealth inequality. First, derivatives typically redistribute wealth over time, as market participants often use them to secure future monetary outcomes or physical assets. Second, the effects of Financial Development and Financial Liberalization, as previously defined, require time to manifest in the economy. Finally, lagging variables address potential endogeneity issues in the econometric modelling.

### 3. Main results

#### 3.1. Baseline model

Table 1 presents the impact of key variables identified in the literature, on the wealth distribution, as well as the effect of our primary variable of interest, the notional value of derivatives. We can see that financial derivatives are significant in both equations (a) and (d), indicating that the integration of derivatives in the economy affects the wealth distribution. Specifically, the significance of derivatives implies that their use can exacerbate wealth disparities, potentially through mechanisms such as leverage and risk hedging that disproportionately benefit those with greater financial resources (Haiss and Sammer, 2010; Xavier, 2021). In the primary specification in column (d), we observe that Stock Market Capitalization, Trade, and FDI all have a positive impact on wealth inequality, consistent with existing literature (De Haan et al., 2017; Adão et al., 2022; Brei et al., 2023). These variables typically facilitate capital flows and economic activities that can lead to wealth concentration among certain groups. Conversely, after accounting for controls, the Financial Development Index and Financial Liberalization appears to have no significant effect on wealth distribution, which contrasts with findings in the income inequality literature (Rajan and Zingales, 2003; Beck et al., 2007; Demirgüç-Kunt and Levine, 2009; Agnello et al., 2012; Beck et al., 2014; Law et al., 2014; Jauch and Watzka, 2016; Bumann and Lensink, 2016; De Haan et al., 2017). One possible explanation for this discrepancy is that the countries in our sample may have reached a stage of financial development and liberalization where additional growth in the financial sector no longer leads to substantial changes in wealth distribution. This could be due to the already high level of financial sophistication and stability, resulting in limited variability these variables have on wealth outcomes over the period analyzed.

<sup>5</sup> IMF index, Sviryzdenka (2016)

<sup>6</sup> World Uncertainty Index, Ahir et al. (2022)

**Table 1**  
Derivatives and Wealth Inequality: Fixed Effects Panel Estimations.

Variables	(a)	(b)	(c)	(d)
Derivatives	<b>5.92e-09***</b> (1.71e-09)			<b>3.61e-09**</b> (4.42e-10)
Financial Development		<b>0.11*</b> (0.057)		3.89e-02 (4.28e-02)
Financial Liberalization			<b>1.95e-03***</b> (6.14e-04)	1.03e-03 (9.77e-04)
Stock market				<b>5.38e-05***</b> (1.15e-05)
Trade				<b>5.49e-04***</b> (1.06e-04)
FDI				<b>1.27e-04**</b> (5.71e-05)
Uncertainty Index				−1.73e-03 (9.01e-03)
Political Globalization				4.54e-04 (3.44e-04)
Inflation				−3.93e-04 (1.44e-03)
GDP growth				−9.55e-05 (5.02e-04)
Population growth				1.44e-03 (6.82e-03)
Gross savings				−1.34e-03 (9.02e-04)
Unemployment				−1.15e-03 (1.76e-03)
Observations	410	271	271	245
R-squared	0.037	0.06	0.02	0.39

Notes: Country fixed effects included. Robust standard errors in parentheses. Standard errors clustered at the country level.

Significance level: \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Column (d) presents the estimation of model (1) while (a), (b) and (c) restricted versions of the same model.

### 3.2. Risk source analysis

Next, we analyze the impact of different types of derivatives, based on their risk source, on wealth inequality. The derivatives proxy used in our analysis includes the two primary categories from the Bank for International Settlements database: foreign exchange derivatives and interest rate derivatives. These are among the most widely used derivatives globally, as large financial institutions employ them to manage common risk exposures and navigate the challenges of a volatile global economic environment. Our findings, presented in Table 2, reveal that both foreign exchange and interest rate derivatives exert a positive influence on wealth inequality, aligning with our main results. These outcomes suggest that the use of these derivatives can exacerbate disparities in wealth distribution. For robustness, we also employed a random effects model, which supports the consistency of our results. We are using the following regressions:

$$Wealth_{i,t} = \beta_0 + \beta_1 Derivatives_{i,t-1}^{Forex} + \beta_2 FinancialDevelopment_{i,t-1} + \beta_3 FinancialLiberalization_{i,t-1} + \beta_4 X_{i,t} + \eta_i + \epsilon_{i,t} \quad (2)$$

$$Wealth_{i,t} = \beta_0 + \beta_1 Derivatives_{i,t-1}^{Interest\ rate} + \beta_2 FinancialDevelopment_{i,t-1} + \beta_3 FinancialLiberalization_{i,t-1} + \beta_4 X_{i,t} + \eta_i + \epsilon_{i,t} \quad (3)$$

**Table 2**  
Derivatives and Wealth Inequality: Foreign Exchange and Interest Rate Derivatives.

Variables	(a) Fixed Effects	(b) Random Effects	(c) Fixed Effects	(d) Random Effects
Foreign Exchange Derivatives	<b>2.45e-07***</b> (4.69e-08)	<b>5.04e-07***</b> (1.78e-07)		
Interest Rate Derivatives			<b>3.51e-09**</b> (4.34e-10)	<b>5.23e-09***</b> (1.16e-09)
Financial Development	2.78e-02 (4.29e-02)	−0.16*** (0.05)	3.9e-02 (4.28e-02)	−6.38e-02* (3.74e-02)
Financial Liberalization	1.17e-03 (8.47e-04)	−1.32e-03 (2.5e-03)	1.02e-03 (9.81e-04)	−7.43e-04 (1.69e-03)
Stock market	<b>5.59e-05***</b>	<b>9.42e-05***</b>	<b>5.37e-05***</b>	<b>7.34e-05***</b>

(continued on next page)

Table 2 (continued)

Variables	(a) Fixed Effects	(b) Random Effects	(c) Fixed Effects	(d) Random Effects
Trade	(1.17e-05) <b>5.21e-04***</b>	(2.12e-05) −6.51e-04	(1.15e-05) <b>5.49e-04***</b>	(1.39e-05) <b>1.39e-04*</b>
FDI	(1.06e-04) <b>1.21e-04**</b>	(1.5e-04) <b>2.21e-04**</b>	(1.06e-04) <b>1.27e-04***</b>	(8.38e-05) <b>2.01e-04***</b>
Uncertainty Index	(5.54e-05) −1.1e-03	(9.87e-05) <b>2.51e-02***</b>	(5.71e-05) −1.71e-03	(7.3e-05) 1.11e-02
Political Globalization	(9.28e-03) 5.11e-04	(8.61e-03) 9.67e-04	(8.99e-03) 4.52e-04	(7.43e-03) <b>1.4e-02*</b>
Inflation	(3.38e-04) −1.96e-04	(6.84e-04) 1.57e-02	(3.45e-04) −3.97e-04	(7.54e-04) 1.1e-03
GDP Growth	(1.42e-03) −9.74e-05	(1.52e-03) 7.13e-05	(1.44e-03) −9.73e-05	(1.54e-03) 1.16e-04
Population Growth	(4.95e-04) 3.77e-03	(5.94e-04) 7.22e-03	(5.02e-04) 1.49e-03	(3.98e-04) 5.33e-03
Gross Savings	(6.99e-03) −1.29e-03	(1.12e-02) −2.31e-03	(6.82e-03) −1.34e-03	(8.77e-03) −1.76e-03
Unemployment	(9.14e-04) −1.32e-03	(1.56e-03) 2.04e-03	(9.02e-04) −1.15e-03	(1.46e-03) 3.68e-04
Observations	(1.7e-03) 245	(2.06e-03) 245	(1.76e-03) 245	(1.26e-03) 245
R-squared	0.41	0.73	0.39	0.49

Notes: Country fixed effects included. Robust standard errors in parentheses. Standard errors clustered at the country level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Columns (a) and (b) report the results for the estimation of model (2) while columns (c) and (d) present the results for the estimation of model (3).

### 3.3. Derivatives instrument analysis

We investigate the impact of various types of derivatives on wealth inequality, focusing on the distinct mechanisms and accessibility of futures and options. Options grant the buyer the right, but not the obligation, to buy or sell a specific asset in the future at a predetermined price, contingent upon paying a premium. In contrast, futures contracts require the buyer or seller to purchase or sell a specified asset at a predetermined price on a future date, necessitating an initial margin deposit. The choice between these instruments depends on several factors, reflecting the unique characteristics and risk profiles of each derivative. The model we are using is:

$$Wealth_{i,t} = \beta_0 + \beta_1 Derivatives_{i,t-1}^{Futures} + \beta_2 FinancialDevelopment_{i,t-1} + \beta_3 FinancialLiberalization_{i,t-1} + \beta_4 X_{i,t} + \eta_i + \epsilon_{i,t} \quad (4)$$

$$Wealth_{i,t} = \beta_0 + \beta_1 Derivatives_{i,t-1}^{Options} + \beta_2 FinancialDevelopment_{i,t-1} + \beta_3 FinancialLiberalization_{i,t-1} + \beta_4 X_{i,t} + \eta_i + \epsilon_{i,t} \quad (5)$$

Our findings indicate that futures contracts significantly influence wealth inequality, regardless of whether they pertain to foreign exchange or interest rate instruments. Conversely, only interest rate options exhibit a significant effect, whereas forex options do not demonstrate statistical significance.

Futures emerge as the primary driver of wealth inequality, with their substantial volume in our dataset compared to options. Despite these differences, derivatives—particularly futures, as shown in Table 3—play a significant role in influencing wealth inequality.

Table 3

Derivatives and Wealth Inequality: Futures and Options.

Variables	(a) Forex Futures	(b) Forex Options	(c) Interest Rate Futures	(d) Interest Rate Options	(e) Total Futures	(f) Total Options
Derivatives	<b>2.70e-07***</b> (4.69e-08)	9.07e-07 (5.43e-07)	<b>5.53e-09***</b> (7.48e-10)	<b>6.2e-09***</b> (1.86e-09)	<b>5.63e-09***</b> (7.52e-10)	<b>3.59e-09***</b> (1.86e-09)
Financial Development	2.78e-02	2.22e-02	3.91e-02	3.9e-02	3.88e-02	3.89e-02
Financial Liberalization	(4.29e-02) 1.17e-03	(4.55e-02) 5.35e-04	(4.28e-02) 1.05e-03	(4.28e-02) 9.77e-04	(4.28e-02) 1.05e-03	(4.28e-02) 9.75e-04
Stock market	(8.47e-04) <b>5.59e-05***</b>	(1.09e-03) <b>5.45e-05***</b>	(9.68e-04) <b>5.36e-05***</b>	(1.01e-03) <b>5.4e-05***</b>	(9.63e-04) <b>5.36e-05***</b>	(1.01e-03) <b>5.4e-05***</b>
Trade	(1.17e-05) <b>5.2e-04***</b>	(1.13e-05) <b>5.63e-04***</b>	(1.15e-05) <b>5.49e-04***</b>	(1.18e-05) <b>5.51e-04***</b>	(1.14e-05) <b>5.48e-04***</b>	(1.18e-05) <b>5.51e-04***</b>
FDI	(1.05e-04) <b>1.21e-04***</b>	(1.04e-04) <b>1.2e-04**</b>	(1.5e-04) <b>1.27e-04**</b>	(1.07e-04) <b>1.26e-04***</b>	(1.05e-04) <b>1.27e-04*</b>	(1.18e-05) <b>1.26e-04**</b>
Uncertainty Index	(5.54e-05) −1.1e-03	(5.47e-05) −1.75e-04	(5.7e-05) −1.19e-03	(5.76e-05) −1.23e-03	(5.69e-05) −1.93e-03	(5.75e-05) −1.24e-03

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Table 3 (continued)

Variables	(a) Forex Futures	(b) Forex Options	(c) Interest Rate Futures	(d) Interest Rate Options	(e) Total Futures	(f) Total Options
Political Globalization	(9.28e-03) 5.11e-04 (3.38e-04)	(9.25e-03) 4.09e-04 (3.31e-04)	(9.01e-03) 4.57e-04 (3.44e-04)	(8.93e-03) 4.37e-04 (3.47e-04)	(9.02e-03) 4.59e-04 (4.43e-04)	(8.93e-03) 4.38e-04 (3.47e-04)
Inflation	−1.96e-04 (1.42e-03)	−3.2e-04 (1.41e-03)	−3.79e-04 (1.44e-03)	−4.32e-04 (1.44e-03)	−3.73e-04 (1.44e-03)	−4.31e-04 (1.44e-03)
GDP Growth	−9.74e-05 (4.95e-04)	−1.55e-04 (5.01e-04)	−9.39e-05 (5.01e-04)	−1.15e-04 (5.06e-04)	−9.23e-05 (5.01e-04)	−1.14e-04 (5.06e-04)
Population Growth	3.77e-03 (6.99e-03)	2.62e-03 (6.72e-03)	1.66e-03 (6.82e-03)	1.11e-03 (5.06e-04)	1.73e-03 (3.43e-04)	4.38e-04 (6.85e-03)
Gross Savings	−1.29e-03 (9.14e-04)	−1.27e-03 (9.06e-04)	−1.35e-03 (9.03e-04)	0.131e-03 (9.02e-04)	−1.35e-03 (9.03e-04)	−1.31e-03 (9.02e-04)
Unemployment	−1.32e-03 (1.7e-03)	−1.14e-03 (1.7e-03)	−1.15e-03 (1.76e-03)	−1.16e-03 (1.77e-03)	−1.15e-03 (1.75e-03)	−1.15e-03 (1.77e-03)
Observations	245	245	245	245	245	245
R-squared	0.42	0.40	0.39	0.39	0.39	0.39

Notes: Country fixed effects included. Robust standard errors in parentheses. Standard errors clustered at the country level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Columns (a), (b) and (e) present the results for estimation of model (4) while columns (c), (d) and (f) present the results for the estimation of model (5).

#### 4. Robustness analysis

Our primary analysis employs a panel fixed effects model, controlling for country-specific effects. Following [Clarke et al. \(2006\)](#), who argue that fixed effects can eliminate substantial cross-country variation, we also apply a random effects model to test the robustness of our findings. Since the Hausman test does not always definitively indicate the preferable model, using both methods help ensure the reliability of our results. Notably, the random effects model yields result consistent with those from the fixed effects model, suggesting that our findings are robust and not influenced by the choice of estimation technique.

Additionally, to address potential sensitivity in our derivatives measure, we use alternative proxies. [Arrigoni \(2024\)](#) examines the impact of financial globalization on wealth inequality by using an international financial integration index, which is calculated as the

Table 4

Derivatives and Wealth Inequality: Robustness Tests.

Variables	(a) Random Effects Main Specification	(b) Stock Derivatives Fixed Effects	(c) Stock Derivatives Random Effects
Derivatives	<b>5.4e-09***</b> (1.13e-09)	<b>2.52e-09***</b> (9.07e-10)	<b>2.48e-09**</b> (9.33e-10)
Financial Development	<b>−6.68e-02*</b> (3.78e-02)	3.98e-02 (4.42e-02)	3.26e-02 (4.01e-02)
Financial Liberalization	−7.7e-04 (1.71e-03)	<b>1.36e-03*</b> (6.19e-04)	1.16e-03 (7.51e-04)
Stock market	<b>7.38e-05***</b> (1.41e-05)	<b>5.84e-05***</b> (1.34e-05)	<b>6.1e-05***</b> (1.16e-05)
Trade	<b>1.34e-04*</b> (8.38e-05)	<b>4.88e-04***</b> (1.13e-04)	<b>4.26e-04***</b> (8.37e-05)
FDI	<b>2.01e-04***</b> (7.38e-05)	<b>1.33e-04**</b> (5.76e-05)	<b>1.42e-04***</b> (5.41e-05)
Uncertainty Index	1.14e-02 (7.42e-03)	−2.23e-03 (1.13e-03)	−1.23e-03 (8.93e-03)
Political Globalization	1.41e-03 (7.54e-04)	5.21e-04 (3.54e-04)	<b>6.95e-04*</b> (3.84e-04)
Inflation	1.12e-03 (1.54e-03)	−2.52e-04 (1.44e-03)	−7.1e-05 (1.43e-03)
GDP Growth	1.19e-04 (4.02e-04)	−2.14e-05 (4.82e-04)	1.15e-05 (4.31e-04)
Population Growth	5.42e-03 (8.84e-03)	1.41e-03 (7.06e-03)	6.95e-04 (3.84e-04)
Gross Savings	−1.78e-03 (1.46e-03)	−1.15e-03 (9.51e-04)	−1.15e-03 (1.02e-04)
Unemployment	4.14e-04 (1.29e-03)	−1.43e-03 (1.79e-03)	−1.33e-03 (1.57e-03)
Observations	245	245	245
R-squared	0.51	0.41	0.40

Notes: Country fixed effects included. Robust standard errors in parentheses. Standard errors, clustered at the country level. Significance level: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

scaled sum of portfolio equities, FDI, debt, and financial derivatives. The data for this index is sourced from the External Wealth of Nations, primarily based on IMF statistics. For the financial derivatives component, Arrigoni utilizes the stock of financial derivatives (both assets and liabilities) as a proxy in his empirical analysis. To validate our findings, we also follow his approach by employing the financial derivatives stock variable.

The results, presented in Table 4, confirm that our conclusions hold across both fixed and random effects models and remain robust to different derivative measures. This underscores the robustness and broader applicability of our findings.

## 5. Conclusion

Our study explores the relationship between the significant presence and prevalence of financial derivatives on the economy and wealth inequality, revealing a robust positive association that suggests derivatives can exacerbate wealth disparities through mechanisms like leverage and risk management, which tend to favor more financially sophisticated participants. Our findings remain consistent across different econometric models and alternative measures of derivatives, indicating the robustness of our results, challenging the conventional view of derivatives as merely redundant assets and emphasizing their significant role in shaping global wealth distribution.

It is important to note that our estimations using the pre-tax Gini coefficient do not account for distribution policies implemented by governments. This approach allows us to isolate the direct impact of derivatives on wealth inequality, independent of government interventions. However, this also highlights the need for future research to explore the post-tax effects of derivatives on wealth distribution and the role of government policies in mitigating or amplifying these impacts. As debates around wealth concentration at the upper end of the distribution intensify, understanding the interplay between financial instruments and government interventions is crucial for forming effective policy responses.

## CRedit authorship contribution statement

**Christos Angelopoulos:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Christos Giannikos:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization.

## Data availability

Data will be made available on request.

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