

DRIVERS OF MACROECONOMIC INCOME INEQUALITY : THEORY AND AN EMPIRICAL ANALYSIS

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Drivers of Macroeconomic Income Inequality: Theory and an Empirical Analysis

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“The disposition to admire, and almost to worship, the rich and the powerful, and to despise, or, at least, to neglect persons of poor and mean condition is the great and most universal cause of the corruption of our moral sentiments.”

—— ADAM SMITH

SCOTTISH POLITICAL ECONOMIST

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Author,

Jaco De Bacquer

Supervisor,

Prof. dr. Freddy Heylen

Preface

I am pleased to present my master's dissertation, titled "Drivers of Macroeconomic Income Inequality: Theory and an Empirical Analysis", submitted to attain the degree of "Master of Science in Economics". This thesis delves into the macroeconomic determinants of inequality, employing a comprehensive approach that combines a literature review with an empirical analysis. Throughout the entirety of this dissertation, this dissertation has taken me through a journey through research in academic literature, data analysis, coding, and introspection.

My foremost gratitude goes to my supervisor for his engaging lectures, experienced guidance, and invaluable comments. I also appreciate the faculty for their exceptional lectures and these thought-provoking four years. Furthermore, I would like to express my gratitude to my fellow students for their companionship and sense of belonging.

I would also like to thank my friends for their enduring support and cheerful university life. Finally, I would like to thank my parents for financing my studies, believing in me, and their never-ending support.

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List of Abbreviations

ADF Augmented Dickey-Fuller

CCE Common correlated effects

CCEP Common correlated effects pooled

CD Cross-sectional dependence

ECM Error correction model

Fed Federal Reserve

FOMC Federal Open Market Committee

GDP Gross domestic product

ICT Information and communication technology

IMF International Monetary Fund

LM Lagrange Multiplier

LP Local projections

OECD The Organization for Economic Cooperation and Development

OLS Ordinary Least Squares

OPEC Organization of the Petroleum Exporting Countries

PPP Purchasing power parity

R&D Research and Development

SBTC Skill-biased technological change

TFP Total factor productivity

US United States

VAR Vector autoregressive

PVAR Panel Vector autoregressive

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1 Introduction

The founder of macroeconomics, John Maynard Keynes (1936), saw two grave flaws in the economic system. Its inability to offer full employment is the first. Its uneven and arbitrary allocation of income and wealth is the second. We definitely appear to be heading in the wrong direction for the latter. Wealth and income inequality have been rising sharply since the 1970s, and this trend has accelerated in the aftermath of the financial crisis. In recent years there has been increasing awareness of the issue of inequality, which has raised concerns about equity and made policymakers' job of addressing today's societal issues, such as ageing and climate change, even more challenging. Attention must be paid to efficiency as well as equity.

This dissertation seeks to identify the distinct macroeconomic drivers of the observed increase in income inequality. The primary focus is on enduring structural shifts rather than short-term business cycle fluctuations. I first conduct a comprehensive review of both the theoretical and empirical literature to define the channels through which potential drivers influence inequality. Subsequently, I assess the significance of these various drivers within one unbalanced panel dataset spanning 1970-2020 and encompassing 35 OECD countries. To ensure robustness, I consider various specifications and conduct several robustness tests.

My research indicates that a large fraction of the rise in income inequality can be attributed to skill-biased technological change, particularly when not counteracted by a simultaneous increase in human capital investment. Additionally, financial globalisation, financial deepening, and the decline in unionisation have all played roles in exacerbating income disparities. However, the tax burden exhibits a limited but existing ability to alleviate some of the upward pressure exerted by these drivers on income inequality.

The recent surge in inflation has fuelled debates regarding its potential to exacerbate inequality. Proponents of decisive action often argue that inflation worsens inequality. To delve deeper into the effects of inflation, I complement my analysis with a Local Projections methodology incorporating exogenous shocks for the US. My research reveals that demand-pull inflation is capable of mitigating income, consumption, and expenditure inequality, whereas supply-push inflation tends to magnify such inequalities. Furthermore, my findings suggest that a contrac-

tionary monetary policy response to negative supply shocks intensifies the regressive impacts of these shocks (but also proves to be effective in curbing inflation). Therefore, proponents of decisive action to lower inflation may be misguided in their assumptions about inflation's impact on inequality.

Before focusing on the different drivers of inequality, I explore the relevance of income inequality and its implications. Following this discussion, I will use the Galor & Zeira (1993) framework to conduct an in-depth analysis of the relationship between inequality and human capital accumulation.

Section 2 presents certain stylised facts concerning income inequality. The importance of income inequality is then examined in Section 3, with Subsection 3.4 focusing on Galor & Zeira's (1993) model of the connection between inequality and the accumulation of human capital. Section 4 concentrates on the various potential macroeconomic drivers of income inequality. Section 5 empirically tests these drivers through a panel data approach, accompanied by robustness checks. In Subsection 5.8, an in-depth exploration of the relationship between inflation and inequality is conducted using local projections. The dissertation concludes with a conclusion in Section 6.

2 Stylised Facts about Income Inequality

Both the Gini coefficients pertaining to disposable income and market income have risen since the 1980s in OECD countries, as depicted in Figure 1. Furthermore, Figure 1 also shows a slightly growing gap between the Gini coefficient pertaining to disposable income and the Gini coefficient pertaining to market income. This growing disparity could signify a reduction in redistributive policies. It should be noted, however, that the rise of the Gini coefficient pertaining to market income highlights that the increase in inequality cannot exclusively be attributed to less redistribution, since market income represents income before taxes and social transfers. Consequently, exogenous shocks should be analysed as well in the study of rising inequality.

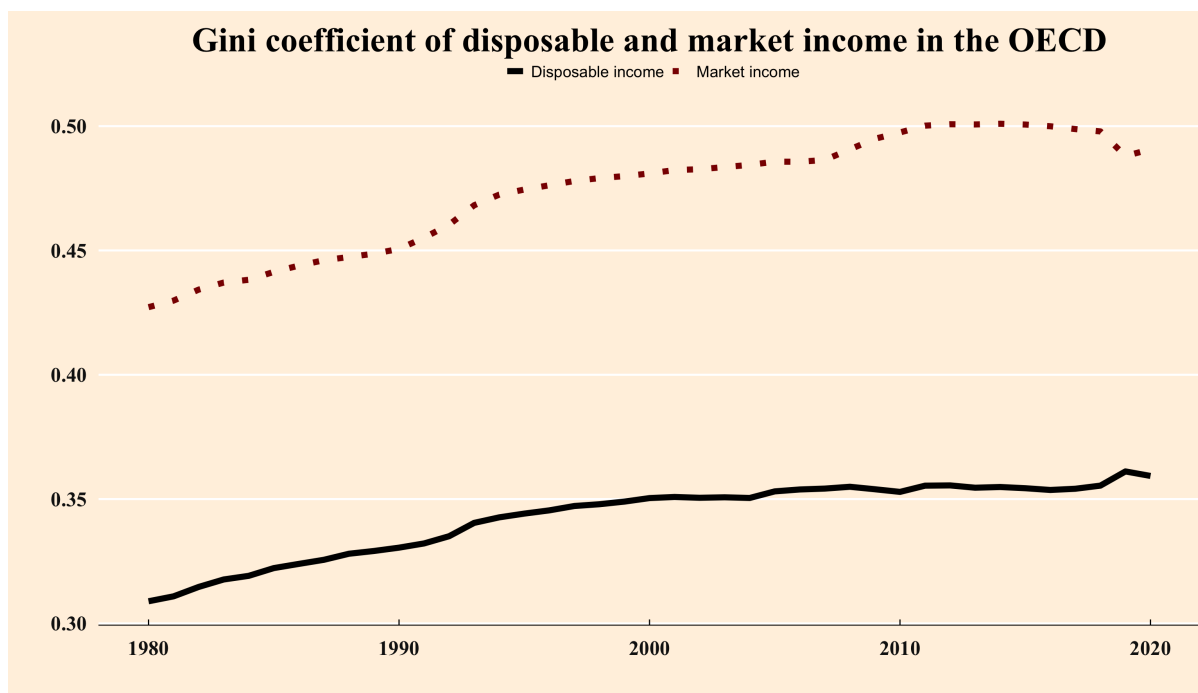


Figure 1: Gini coefficient of disposable income & Gini coefficient of market income in a (population-weighted) selection of OECD countries (1980-2020)

Source: SWIID, Standardized Income Inequality Database (SWIID), 2023, 'Gini of disposable income' & 'Gini of market income'

Note: Calculated by taking the (population)-weighted average of the Gini coefficients of all the OECD countries except Austria, Costa Rica, Czech Republic, Estonia, Iceland, Lithuania, Luxembourg, Latvia, Norway, New Zealand, Poland, Slovakia, Slovenia, and Turkey for each year (data is not available for these countries).

Another intuitive way to analyse inequality dynamics is by paying attention to income shares. The evolution of income shares can shed light on which parts of the change in the income distribution contribute most to the rise of the Gini coefficient. In OECD nations, the pre-tax income shares of the Top 1% and the Top 10% have witnessed a remarkable increase, accompanied by a decline in the income share of the Bottom 20% (Figure 2). Moreover, Figure 2 also illustrates that the rise of the Top 1% is steeper than the rise of the Top 10%. To put things in perspective, the pre-tax income share of the Top 1% in OECD countries has demonstrated an incline of more than 50%. It is this concentration at the top that has sparked the most controversy, with many arguing that such an elevation lacks any compelling justification (Hacker & Pierson, 2010).

The share of labour in national income has also decreased in the majority of the OECD countries (Figure 4). It is important to note that there is a strong inverse relationship between the labour share and income inequality (IMF; World Economic Outlook, April 2017). When the labour share is lower, inequality tends to rise.

The decline of the labour share came under international attention after the publication of

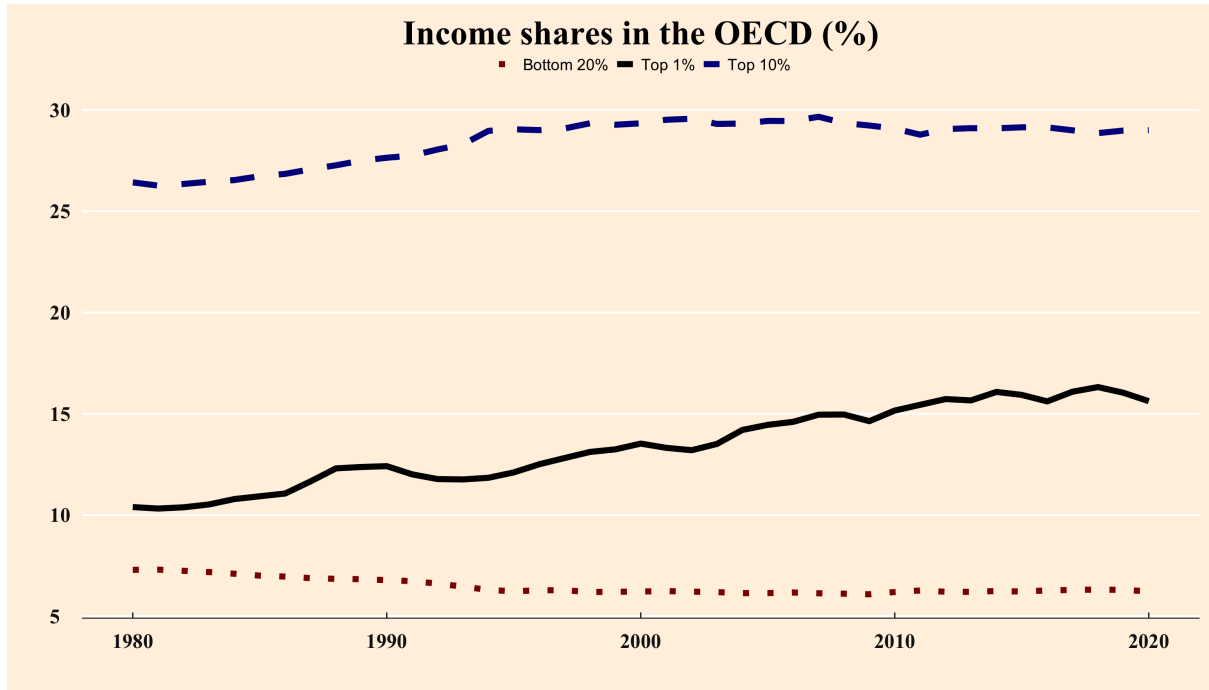


Figure 2: Income shares (%) in the (population-weighted) OECD (1980-2020)

Source: UNU-WIDER, World Income Inequality Database (WIID), WIID explorer, 2023, 'Top 10% income share' & 'Bottom 20% income share'

WID, World Inequality Database, Key Indicators, 'Top 1% income share' & 'Population'

Note: Calculated by taking the (population)-weighted average of the income shares of all the current OECD countries for each year.

Thomas Piketty's influential book, "Capital in the Twenty-First Century". In his book, Piketty posits that a declining share of labour in national income is a natural phenomenon inherent to capitalist regimes. Whether this is actually the case is still vigorously debated among economists (King, 2017).

Figure 4 offers insight into which OECD countries experienced an increase in inequality. Figure 5 illustrates that inequality has risen in many OECD countries, but not in all of them¹. There appears to be a trend of convergence in the Gini coefficient, whereby nations characterised by low inequality in 1970 have witnessed a steep rise, while conversely, those nations marked by high inequality in 1970 have observed a cutback in their Gini coefficients. In my panel cointegration analysis in section 5, I will use these different within-country variations to identify the different drivers of the rise in inequality in advanced economies.

¹Inequality has been increasing primarily in the larger OECD countries.

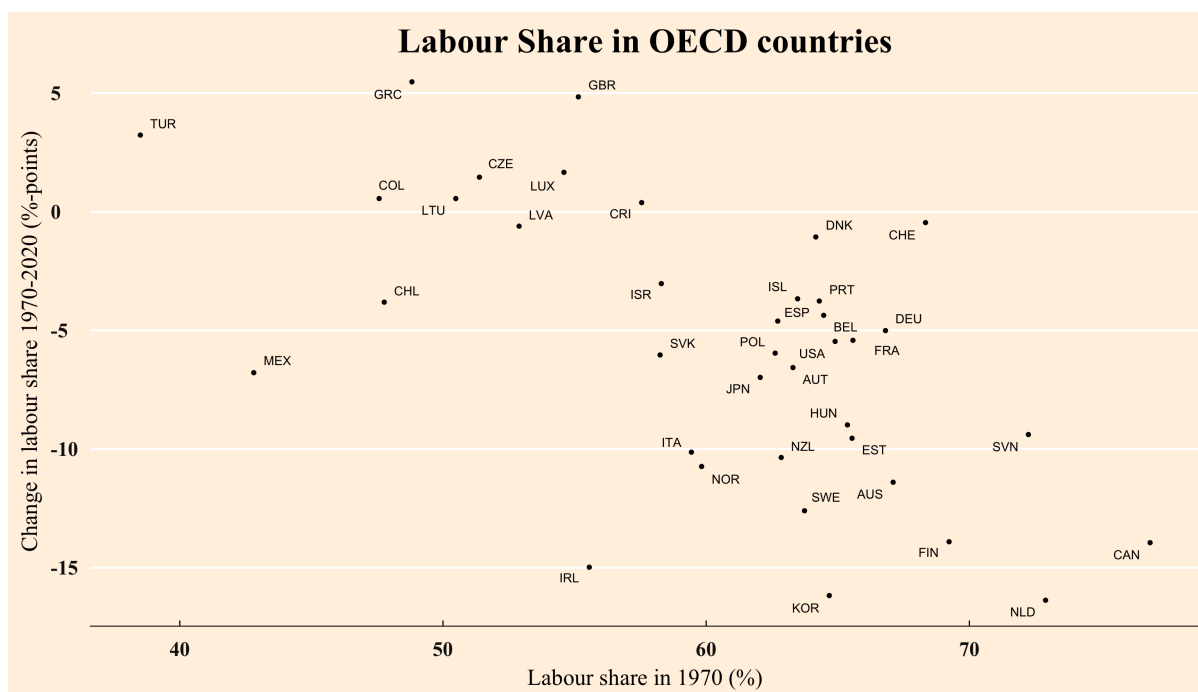


Figure 3: The share of labour in national income (%) in OECD countries in 1970 and its change since 1970 (1970-2020)

Source: Penn World Table, PWT 10.01, 2023, 'labsh'

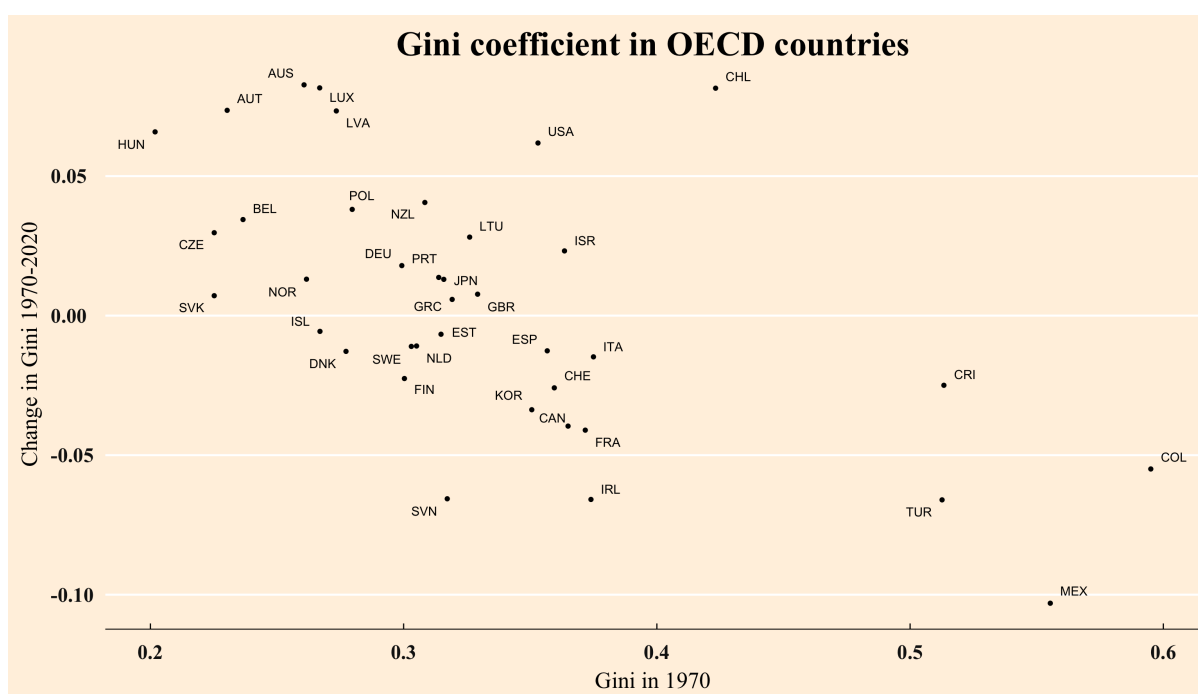


Figure 4: The Gini coefficient of disposable income in OECD countries in 1970 and its change since 1970 (1970-2020)

Source: UNU-WIDER, World Income Inequality Database (WIID), WIID explorer, 2023, 'Gini coefficient'

3 Why Income Inequality Matters

Inequality bears many repercussions and implications for society. Aside from ethical concerns, inequality also has many (macro)economic implications. In what follows, I outline some of the most prominent possible consequences income inequality may have on the economy in advanced economies.

3.1 Economic Growth

The impact of inequality on economic growth has been widely discussed in academic literature (Berg et al., 2018). There are both arguments that claim that inequality is growth-enhancing and arguments that emphasize for an inverse relationship between inequality and economic growth (Berg et al., 2018).

Arguments positing that greater inequality enhances growth include:

- **The theory of investment indivisibilities:** Wealth concentration (a result of higher inequality) is necessary as initial investments, such as R&D and infrastructure, often require considerable means (Aghion & Howitt, 1998).²
- **The savings argument:** Inequality leads to higher aggregate savings since rich people have a higher propensity to save, which results in lower long-term interest rates (Kaldor, 1957; Aghion et al., 1999; Bourguignon, 1981; Rebelo, 1991; Bourguignon, 1990; Shin, 2012). Those lower interest rates would, in turn, lead to higher aggregate investment and growth.³
- **The “leaky bucket” hypothesis:** Unequal outcomes can be a driver of effort, innovation, and entrepreneurship (Okun, 1975; Lazear & Rosen, 1981). Redistribution and taxes with the intent of mitigating inequality diminish the incentives of the most productive in society, resulting in lower growth (Okun, 1975; Mirrlees, 1971; Alesina & Rodrik, 1994; Barro, 2000; Perotti, 1993).

²Barro (2000) notes that this theory also holds for human capital, as a minimum level of education is most often needed to receive a skill premium.

³The validity of this argument may, however, be doubtful as outlined in subsection 3.2.

Arguments asserting that greater inequality hurts growth include:

- **The political economy argument:** Persistent levels of (severe) inequality can cause social and political unrest (Barro, 2000; Benhabib & Rustichini, 1996; Venieris & Gupta, 1986). Discontent about the current situation may undermine support for growth-enhancing policies such as trade agreements (Claessens & Perotti, 2007). The electoral process itself may be affected by inequality as well (Bartels, 2009). Rent-seeking wealthy individuals and corporations may use their high leverage to influence political campaigns and dismantle electoral integrity (Hacker & Pierson, 2010). Along the same line, it is possible to argue that the more inequality is entrenched in society, the more influence wealthy individuals have in safeguarding their future positions through rent-seeking (Stiglitz, 2012).
- **The imperfect capital market theory:** Poorer individuals have fewer opportunities to invest due to liquidity constraints. This absence of investment by poorer households constrains economic development (Aghion & Bolton, 1992; Bannerjee & Newman, 1993; Panizza, 2002; Galor & Zeira, 1993; Piketty, 1997). In line with this argument, I will present Galor and Zeira's model in which wealth inequality determines the human capital stock and aggregate output both in the short and the long term due to liquidity constraints in subsection 3.5.

Even though the direction in which inequality affects growth has been disputed and controversial for decades, the empirical literature is coming to the consensus that at least over the medium term, inequality harms growth (Alesina & Rodrik, 1994; Persson & Tabellini, 1991; Perotti, 1996; Berg et al., 2018; Malinen, 2012; Breunig & Majeed, 2020; Cingano, 2014; Aiyar & Ebeke, 2020; Marrero & Rodríguez, 2023).

3.2 Financial Stability

In the aftermath of the subprime mortgage crisis, various authors suggested a potential relationship between inequality and financial crises (Rajan, 2010; Acemoglu, 2011; Kumhof et al., 2012; Galbraith, 2012; Van Treeck, 2014). James K. Galbraith, among these authors, developed a theoretical framework to understand this connection in his popular contribution "Inequality and Instability: A Study of the World Economy Just Before the Great Crisis" (Galbraith, 2012). Following Galbraith, inequality renders low-income individuals more vulnerable and pushes

them to resort to credit to make ends meet⁴. This ongoing process makes financial institutions increasingly exposed to overleveraged low-income earners, thereby creating risks to financial stability (Galbraith, 2012). Rising top incomes might also enhance wealthy households' ability to push for more deregulation. Empirical evidence, however, remains mixed with contrasting conclusions (Bordo & Meissner, 2012; Perugini & Collie, 2016).

3.3 Macroeconomic Stabilisation Policy

It should be taken into account that heightened inequality is likely to exert an influence on macroeconomic stabilisation policy (Dosi et al., 2013). Brinca et al. (2021) note that the intertemporal elasticity of substitution of labour and consumption is increasing in wealth. Individuals possessing lower levels of wealth respond less to future changes in income, but are more sensitive to contemporaneous alterations in income (Brinca et al., 2021). Wealth and income inequality have the potential to induce greater volatility in labour supply and private consumption, consequently impacting the volatility of the business cycle (Kaplan & Violante, 2018; Dosi et al., 2013). Volatility in the business cycle can create significant economic uncertainty, leading to several adverse effects. These include a reduction in long-term investments, an increase in precautionary savings, highly cyclical government budgets, decreased financial sector stability, and heightened political instability.

One explanation for why low-income households are more responsive to economic cycles than high-income households is the presence of liquidity constraints (Kaplan, Moll & Violante, 2018). While not a direct outcome of inequality, the prevalence of liquidity and credit-constrained households exhibits a strong correlation with both income and wealth inequality (Bilbiie, 2018; Almgren et al., 2022; Chikhale, 2023). Liquidity constraints curtail the capacity of constrained households to spread consumption over their lifetimes. Should a substantial proportion of households in the economy suffer from liquidity constraints, this scenario has the potential to amplify business cycle volatility (even) further (Ampudia et al., 2018; Ahn et al., 2018; Gali, 2018).

⁴A similar argument is given by Rajan (2010), who also points to inequality as a driver of the Great Recession. Furthermore, Rajan stresses that little has been done to address this systematic vulnerability in the immediate years after the crisis.

Higher levels of income inequality suggest a greater role for fiscal and monetary authorities to stabilise the economy, as these economies are more often characterised by credit constraints and a higher fraction of (near) rule-of-thumb consumers. Conversely, fiscal and monetary policy tools also tend to be more effective in such environments (Hagedorn et al., 2019; Debortoli & Gali, 2017; Gali et al., 2007, Heylen & Rymenant, 2024).

3.4 Human Capital and Productivity

Another interesting question is how inequality affects the human capital stock and, consequently, productivity. As discussed in subsection 3.1, one mechanism through which inequality may influence economic growth is by limiting investment opportunities and imposing liquidity constraints on many individuals in highly unequal societies. Galor and Zeira (1993) developed a model elucidating how wealth inequality can impact aggregate output in both the short and the long run through liquidity constraints.

In what follows, I present the model of Galor and Zeira (1993) under which different distributions of wealth can result in different levels of human capital accumulation and how this subsequently affects aggregate output both in the short and the long run. With the intent of enhancing reader comprehension, I have made some minor modifications to the original model.

Galor and Zeira (1993) developed an overlapping generations model characterised by perfectly competitive good markets, imperfect capital markets and rational expectations. In this model, output can be produced by either skilled or unskilled workers. All individuals within the model share the same ability type, differing only in the extent of wealth they inherit. Other assumptions made include the absence of population growth, households comprising a single parent and one offspring, and the absence of technological progress.

Each individual lives for two periods. In the first period, individuals can choose whether to work as unskilled or to invest in human capital. In the second period, everybody works. Those who opted to work as unskilled receive the wage for unskilled labour in both periods, while those who opted to invest receive nothing in the first period but are eligible for a skilled worker's wage in the second period. Investment in human capital is treated as an indivisible choice, in-

dividuals either invest or abstain from it. It is assumed that individuals solely consume in the second period. In addition to consuming, individuals have the option to leave bequests to their offspring during this second period.

Owing to imperfect capital markets, individuals face a higher interest rate when borrowing compared to the interest rate on savings. This discrepancy only holds for individuals and not for firms, as the associated costs of financial intermediation and loan monitoring are higher for individuals. Within this context, individuals have the option to borrow to invest in human capital. Those who are fortunate and are endowed with a substantial inheritance do not need to borrow to finance their human capital investments. Conversely, those less fortunate lack this advantage and must resort to borrowing if they wish to invest in human capital.

As individuals only vary in terms of inherited wealth, the decision of whether to invest in human capital entirely depends on the amount of wealth inherited. In the long run, there will be two categories of dynasties: those in which each descendant invests in human capital and those in which they abstain from investments. The model will demonstrate that the relative size of these two types of dynasties entirely depends on the initial distribution of wealth. As unequal societies are associated with a relatively higher share of low-educated dynasties, GDP per capita is predicted to be lower in unequal societies.

As mentioned before, output can be produced by both skilled and unskilled workers, both in their own sector. Production in the skilled labour sector depends on the number of skilled workers and the physical capital stock, as outlined in Equation 1. Investments are made in the previous period. Y_t^s stands for the output produced in the skilled labour sector at time t . A stands for the (constant) level of technology, K_t denotes the physical capital stock at time t and $L_{s,t}$ denotes the number of skilled labourers at time t .

$$Y_t^s = AK_t^\sigma L_{s,t}^{1-\sigma} \text{ with } 1 > \sigma > 0 \quad (1)$$

Production in the unskilled labour sector is given by Equation 2, where Y_t^n and L_t^n stand for the output produced in the unskilled labour sector at time t and the number of unskilled labourers at time t , respectively. w_n denotes the marginal productivity of unskilled labour, which also

equals the wage for unskilled workers. For simplicity, we assume that production in the unskilled labour sector is independent of the capital stock and that the marginal productivity in the unskilled labour sector is different (lower) from the skilled labour sector.

$$Y_t^n = w_n L_t^n \quad (2)$$

Individuals derive utility from consumption and leaving assets to their offspring (Equation 3). We assume that utility can only be achieved in the second period.

$$u = \alpha \ln(c) + (1 - \alpha) \ln(b) \quad (3)$$

u denotes the utility of an individual. c stands for consumption and b stands for the bequest made by the individual.

We are in an open economy with perfect capital mobility. Firms can borrow at a (time-constant) world interest rate r , which is also the return on savings. Firms operating in the skilled labour sector adjust their capital stock such that Equation 4 holds (it is assumed that there is no depreciation of capital). Given that the world interest and the level of technology rate are constant over time, the capital-labour ratio is constant as well, consequently resulting in a fixed wage for skilled labour⁵.

$$\frac{\partial Y_t^s}{\partial K_t} = A\sigma K_t^{\sigma-1} L_{s,t}^{1-\sigma} = A\sigma \left(\frac{K_t}{L_{s,t}} \right)^{\sigma-1} = r \quad (4)$$

As mentioned before, the interest rate to borrow is higher for individuals than for firms given imperfect capital markets, as indicated in Equation 5. Here, i denotes the interest rate for borrowing by individuals.

$$i > r \quad (5)$$

Equation 6 gives the lifetime resources of an individual who inherited x and who opted not to invest in human capital. The bequest left by this unskilled individual to their offspring is deter-

⁵If one isolates $\frac{K_t}{L_{s,t}}$ and subsequently substitutes the equation for $\frac{K_t}{L_{s,t}}$ in the derivative of Y_t^s with respect to $L_{s,t}$, one will find that the skilled wage is a positive function of A and a negative function of r .

mined by Equation 7. Optimal behaviour implies that bequests are always a fraction $1 - \alpha$ of lifetime resources, the rest of lifetime resources go to individual consumption.

Note that individuals receive a return r on assets from the first period (compensation for lending out resources to firms).

$$A_n(x) = [(x + w_n)(1 + r) + w_n] \quad (6)$$

$$b_n(x) = (1 - \alpha)[(x + w_n)(1 + r) + w_n] \quad (7)$$

Equation 8 provides the resources of an individual who received an inheritance x ($x > h$)⁶ and who decided to invest in human capital. The bequest this individual leaves to their offspring is given by equation 9. Again, note that individuals receive a return r on assets from the first period (compensation for lending out resources to firms).

$$A_{s,1}(x) = [(x - h)(1 + r) + w_s] \quad (8)$$

$$b_{s,1}(x) = (1 - \alpha)[(x - h)(1 + r) + w_s] \quad (9)$$

Equation 10 gives the total accumulated assets of an individual who inherited x (where x is less than h) and who chose to invest in human capital. The bequest left to this individual's offspring is given by equation 11.

$$A_{s,2}(x) = [(x - h)(1 + i) + w_s] \quad (10)$$

$$b_{s,2}(x) = (1 - \alpha)[w_s + (x - h)(1 + i)] \quad (11)$$

An individual who inherits x , with x greater than h , invests in human capital if $w_s - w_n > (w_n + h)(1 + r)$, i.e. individuals only invest if the present value skill premium (gain from studying) is higher than the costs associated with studying (the direct investment cost h and the

⁶ h is the cost of acquiring human capital

opportunity cost w_n). Individuals who inherit x , with x smaller than h , invest in human capital if $w_s - w_n > (w_n + x)(1 + r) + (h - x)(1 + i)$. It is easy to show that $(w_n + x)(1 + r) + (h - x)(1 + i)$ is greater than $(w_n + h)(1 + r)$, i.e. education is more costly for those who need to borrow if they want to invest. We assume that the skill premium $(w_s - w_n)$ is sufficiently high, ensuring that at least the individuals with an inheritance x surpassing h are inclined to invest in human capital. However, the skill premium is not set at a level that would prompt all individuals to undertake human capital investment. Furthermore, to avoid an explosive outcome, we assume that $(1 - \alpha)(1 + r) < 1$ and that $(1 - \alpha)(1 + i) > 1$, such that the spread between r and i is sufficiently high.

Given a skill premium that exceeds $(w_n + h)(1 + r)$, individuals who need to borrow to finance human capital investment will do so if the lifetime resources you can achieve by investing in human capital are higher than the lifetime resources you can achieve by not investing, i.e. $A_{s,2}(x) \geq A_n(x)$:

$$\begin{aligned}
[(x - h)(1 + i) + w_s] &\geq [(x + w_n)(1 + r) + w_n] \\
w_s + x - h + xi - hi &\geq x + xr + w_n + w_nr + w_n \\
x(i - r) &\geq (2 + r)w_n - w_s + h(1 + i) \\
x &\geq \frac{(2 + r)w_n - w_s + h(1 + i)}{i - r} = f
\end{aligned} \tag{12}$$

Individuals will not invest in human capital when their inheritance x falls below f , as specified in Equation 12. Due to the higher interest rate imposed on borrowers, only fortunate individuals endowed with a sufficiently substantial inheritance⁷ can undertake human capital investment.

Within a given generation, there exist three distinct categories of individuals. These include those who refrain from investing in human capital, those who opt for human capital investment through borrowing, and those who can use their own resources to finance education.

The inheritances in the next period are contingent upon the bequests made in the current period, which, in turn, depend on the assets accumulated by the current generation. Equation 13 sum-

⁷Note that since the skilled wage is a positive function of A and a negative function of r , $f(w_n^+, \bar{A}, r^+, h^+, i^+)$.

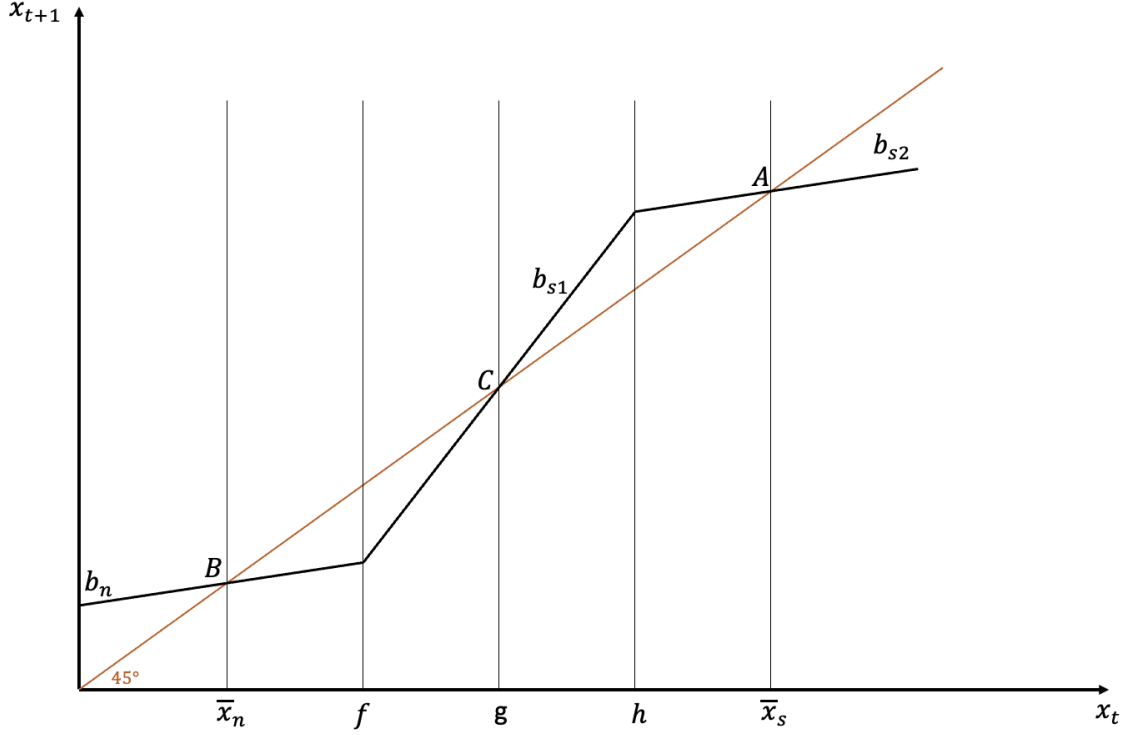


Figure 5: Graphical illustration of the Galor & Zeira (1993) model

marises the potential inheritances for individuals in the next period, accounting for the three distinct types of individuals from the current period.

$$x_{t+1} = \begin{cases} b_n(x_t) = (1 - \alpha)[(x_t + w_n)(1 + r) + w_n] & \text{if } x_t < f \\ b_{s,1}(x_t) = (1 - \alpha)[w_s + (x_t - h)(1 + i)] & \text{if } f \leq x_t < h \\ b_{s,2}(x_t) = (1 - \alpha)[w_s + (x_t - h)(1 + r)] & \text{if } h \leq x_t \end{cases} \quad (13)$$

The three distinct types result in 3 equilibria, of which two are stable⁸ (Figure 5). Only the b_n (point B) and the b_{s2} (point A) equilibria are stable, this is the mathematical representation of the long-term scenario, wherein there exist only two types of dynasties. In the former category, all successive generations remain unskilled, while in the latter, each generation accumulates human capital. Graphically, the slopes of the b_n line and the b_{s2} line at the intersection with the

⁸In the context of this analysis, a stable equilibrium signifies that at these specific points, each generation leaves a bequest to their offspring that equals the bequest that this generation received. Consequently, it follows that the lifetime resources are identical for each generation belonging to this particular type.

45° line⁹ are less than 1, indicating convergence. Conversely, the slope of the b_{s1} line at its intersection with the 45° degree line exceeds one (point C), signalling divergence. These findings follow from our previous assumptions that $(1 - \alpha)(1 + r) < 1$ and that $(1 - \alpha)(1 + i) > 1$.

If we are positioned at either point A or point B, we will consistently remain at that respective location, denoting a stable equilibrium. Any departure from these points will inevitably lead us back to either A or B. The unstable equilibrium, represented by point C, plays a pivotal role in discerning whether we will converge towards point A or point B. Notably, for all points exceeding point C, we will converge towards point A, while for all points below point C, convergence will direct us towards point B.

We can determine these equilibria algebraically by using a no-change restriction ($x_t = x_{t+1}$). In the subsequent paragraphs, we will solve for these equilibria and discuss their underlying intuition.

Individuals who inherit less than f , abstain from human capital investment, and neither will their descendants due to the insufficiency of their inheritances for such investments. Over the long term, the inheritances within this group of dynasties converge to x_n^* .

$$\begin{aligned}
x_n^* &= (1 - \alpha)[(x_n^* + w_n)(1 + r) + w_n] \\
x_n^* &= (1 - \alpha)[x_n^*(1 + r) + w_n(2 + r)] \\
\frac{x_n^*}{1 - \alpha} &= x_n^*(1 + r) + w_n(2 + r) \\
\frac{[1 - (1 - \alpha)(1 + r)]x_n^*}{1 - \alpha} &= w_n(2 + r) \\
x_n^* &= \frac{(1 - \alpha)w_n(2 + r)}{1 - (1 - \alpha)(1 + r)} \tag{14}
\end{aligned}$$

Individuals who inherit more than h engage in human capital investment, and so will their descendants, given the ample resources they have for such investments. Over the long term, the inheritances within this group of dynasties converge to x_s^* .

⁹At the intersections with the 45-degree line, the bequest this generation receives equals the bequest they leave to their offspring.

$$\begin{aligned}
x_s^* &= (1 - \alpha)[w_s + (x_s^* - h)(1 + r)] \\
\frac{x_s^*}{1 - \alpha} &= w_s + x_s^*(1 + r) - h(1 + r) \\
\frac{[1 - (1 - \alpha)(1 + r)]x_s^*}{1 - \alpha} &= w_s - h(1 + r) \\
x_s^* &= \frac{[w_s - h(1 + r)](1 - \alpha)}{1 - (1 - \alpha)(1 + r)} \tag{15}
\end{aligned}$$

Individuals who inherit more than f but less than h opt for human capital investments, yet not all of their descendants will receive sufficient inheritance for such investments. In the long-term equilibrium, there are only two possible dynasties, those in which each generation invests and those in which they do not invest. Since there are only two possible groups in the long run, there is a critical threshold of initial inheritance—denoted as g in Equation 16—which determines to which of the two groups of dynasties the offspring in the long run of either dynasty will belong. Graphically, this critical threshold is equal to the unstable equilibrium (point C).

$$\begin{aligned}
g &= (1 - \alpha)[w_s + g(1 + i) - h(1 + i)] \\
\frac{g}{1 - \alpha} &= [w_s + g(1 + i) - h(1 + i)] \\
\frac{(1 - (1 - \alpha)(1 + i))g}{1 - \alpha} &= w_s - h(1 + i) \\
g &= \frac{[h(1 + i) - w_s](1 - \alpha)}{(1 - \alpha)(1 + i) - 1} \tag{16}
\end{aligned}$$

Individuals inheriting less than g may initially engage in human capital investment. However, over time, their descendants will not invest, and their inheritances converge to x_n^* .

Conversely, individuals inheriting more than g choose to invest in human capital, and this pattern will persist through their descendants. The inheritances of this group eventually converge to x_s^* .

As we can see in equation 16, the critical value (g) will be higher when the investment cost of human capital is higher, when the skilled labour wage is lower, and when the cost to borrow is higher.

Over the long term, the average wealth in the economy ($\bar{x}$) is a weighted average of the wealth of skilled and unskilled generations. This weighted average is given by Equation 17, where L_t^g denotes the number of individuals who inherit less than g . L denotes the total number of individuals in the economy.

$$\bar{x} = x_s^* - \frac{L_t^g}{L}(x_s^* - x_n^*) \quad (17)$$

According to Galor and Zeira (1993), this equation can be interpreted as follows: a society that is affluent in the first period and which exhibits a more equitable wealth distribution (a lower L_t^g) will surpass an initially affluent society characterised by concentrated wealth (a higher L_t^g). In a society characterised by concentrated wealth, a significant portion of individuals may lack the necessary resources to invest in human capital. The presence of liquidity constraints makes borrowing prohibitively expensive, especially when individuals inherit very little and financing the entire investment cost becomes particularly challenging. Access to education is preserved for the lucky few. Intertemporally, bequests to the offspring of the lucky few will be high, while the bequests to the offspring of the low-skilled will remain low. As bequests to the offspring of the low-skilled remain low, these offsprings will also suffer from little opportunities to invest in human capital. Consequently, unequal societies' average stock of human capital will grow slower than in more equal societies. Furthermore, as aggregate output positively depends on the human capital stock, aggregate output will be lower in more unequal societies. Henceforth, this model highlights the implications of wealth inequality, illustrating how a more egalitarian wealth distribution leads to more aggregate wealth and output in the long run.

A Pareto improvement is achievable if the costs of facilitating intertemporal exchange are lower than those of monitoring borrowers (Galor & Zeira, 1993). For instance, the government could subsidize education to lower the individual costs of investing in human capital. This subsidy could be funded by taxing skilled workers in the following period. Such a policy¹⁰ would move the b_s curve in Figure 5 to the left, decrease both f and g , and boost investment and output in both the short and long term.

¹⁰This policy can only lead to a Pareto improvement if the cost of financial intermediation is higher than the cost of tax collection (Galor & Zeira, 1993). This assumption is reasonable for two main reasons. First, the government can avoid tracking individual borrowers by subsidizing all students and taxing all higher-educated workers, without knowing the borrowing amounts of individuals. Second, since the tax system is already functioning for other purposes, the policy would merely involve raising the existing taxes.

4 Potential drivers of the rise in inequality

In the subsequent subsections, I present some of the most frequently cited factors that are believed to contribute to the increase in income inequality. Again, it is important to emphasize that this list is not exhaustive, as I focus on those factors that have received the most attention in academic literature. Our primary focus is on income inequality, as I have chosen to use indicators pertaining to income inequality in my empirical study due to data availability.

4.1 Globalisation

Technological advancements since the 1970s (and particularly the ICT revolution in the 1990s) facilitated outsourcing substantially (Lewis, 2015; Peck, 2017; Baldwin, 2017; Beck, 2018). Companies were able to benefit from the enormous pool of cheap labour in numerous developing countries (Peck, 2017; Scholte, 2017; Baldwin, 2017; Stiglitz, 2017). Today, splitting up production is one of the most commonplace business strategies (Baldwin & Lopez-Gonzalez, 2015; Baldwin, 2017; Scholte, 2017, Beck, 2018).

In both classical international trade theory, such as the Heckscher-Ohlin model, and modern international trade theories built upon imperfect competition, it is commonly believed that trade with countries abundant in (low-skilled) labour can have a depressing effect on wages (of unskilled workers) in more advanced economies (Stolper-Samuelson, 1944; Krugman et al., 1995).

Empirical research tends to confirm that globalisation is one of the causes of the rise in (wage) inequality (Feenstra & Hanson, 1996, 1999, 2003; Autor et al., 2013; Autor et al., 2016; Alderson & Nielsen, 2002; Dauth et al., 2014; Heimberger, 2020). It is important to emphasize that a rise in inequality does not necessarily result in lower real wages for unskilled workers, only that they do not rise as fast. The DFS model illustrates this by asserting that trade liberalisation also leads to lower import prices (Dornbush, Fischer & Samuelson, 1977).

Certain scholars, such as Rodrik (2018), establish a link between globalisation and the upsurge of populism within advanced economies. As trade liberalisation has exacerbated inequality, there may be public dismay at trade-related growth-enhancing policies such as further liberalisation (Claessens & Perotti, 2007). For instance, Colantone and Stanig (2018) identify a causal relationship between the China shock and the Brexit vote.

Next to trade liberalisation, there has also been a substantial globalisation in finance. Much like the effects of globalisation on trade, financial globalisation is associated with higher inequality because of the skewed distribution of gains and because the relative importance of the financial industry is anticipated to increase¹¹ (Jaumotte, Lall & Papageorgiou, 2013). Additionally, the liberalisation of capital flows might facilitate wealth concentration in tax havens (Zucman, 2015).

4.2 Financial Deepening

Since the 1980s up to the financial crisis, financial markets became increasingly deregulated. Free competitive financial markets are a cornerstone of classical theory, which dominated economics for decades (Block, 2011). Initially, financial deepening was considered positive for inequality reduction as it was expected to alleviate credit constraints for those less affluent (Galor & Zeira, 1993; Galor & Moav, 2004; Greenwood & Jovanovic, 1990). Empirical evidence appeared to support this view (Beck, 2004; Honohan, 2004; Rajan, 2003). The financial crisis, however, has curtailed much of this optimism. While reducing credit constraints can help poor individuals, it can have destabilising effects as well if borrowers cannot pay back the loans. In the pursuit of alleviating credit constraints for impoverished individuals, there exists a potential dichotomy as the positive impact of such measures is paired with destabilising consequences, particularly when borrowers lack the financial capacity to repay loans. For example, in the 1990s and 2000s, regulators hoped to cut credit constraints and promote homeownership by permitting banks to extend mortgages to “subprime” borrowers. However, the financial crisis has underscored the necessity of caution in extending credit to individuals who are not able to fulfil their payment obligations. As discussed in Section 3.4, overleveraging of lower-income

¹¹The labour market within the financial industry exhibits a pronounced skill bias, and the growth of the financial sector has the potential to contribute to increased wage inequality.

individuals is frequently cited as one of the triggers of the Great Recession (Rajan, 2010; Galbraith, 2012). Overleveraging is likely to exacerbate income inequality rather than lessen it, especially when it leads to financial crises (Galbraith, 2012).

Various empirical studies also emphasize that heightened financialisation is more likely to result in higher returns for the wealthy (Claessens & Perotti, 2007; Kunieda et al., 2014; Furceri & Loungani, 2015; Bumann & Lensink, 2016). Affluent investors tend to invest more in riskier assets that give higher returns (Varian, 1992). Additionally, within the risky asset class, wealthier individuals seem to be more successful in picking the risky assets with the highest return. More broadly, there are substantial disparities in financial literacy across the different income groups (Grohmann, Klühs & Menkhoff, 2018).

A meta-regression analysis indicates that the impact of financial development on income inequality is not unequivocally positive (Chletsos & Sintos, 2023). The effect varies significantly depending on study characteristics, such as the inclusion of financial openness, inflation, and income variables in the regressions.

4.3 Technological Change

A widely recognised theoretical framework to understand growing disparities in real wages is the reputed “skill-biased technological change” (SBTC) hypothesis (Katz & Murphy, 1992; Juhn, Murphy & Pierce, 1993; Krusell et al., 2000; Acemoglu, 2002; Card & DiNardo, 2002; Autor et al. 2003; Violante, 2008; Acemoglu & Restrepo, 2018; Buera et al., 2022; Acemoglu & Restrepo, 2022). The core idea of the SBTC hypothesis is very straightforward: technological advancements (such as automation, robotisation, and routinisation) since the 1980s have primarily created opportunities for high-skilled workers while diminishing demand for low-skilled individuals. An extensive body of empirical research confirms that technological change contributed to structural changes in labour demand across skill groups (Katz & Murphy, 1992; Juhn, Murphy & Pierce, 1993; Krusell et al., 2003; Autor et al., 2003; Buera et al., 2022; Acemoglu & Restrepo, 2022). Aside from creating disparities between high-skill and low-skill earnings, automation is capable of curtailing the share of labour in national income (Haldane, 2015; Martinez, 2018; Autor & Salomons, 2018; Prettnner & Bloom, 2020).

4.4 Labour Market Institutions

With a resurgence of neoclassical ideas following the economic stagnation in the 1970s, labour markets became increasingly more flexible in advanced economies (Baccaro & Howell, 2011; Ostry et al., 2016; Navarro, 2020). Average unionisation decreased substantially (Baccaro & Howell, 2011; Western & Rosenfeld, 2011). This reduction in union membership, coupled with lower real minimum wages, the dismantling of collective bargaining institutions, relaxed hire and dismissal rules, reduced unemployment benefits, temporary, and contract work and other factors, have been identified to be one of the causes of the upshot in inequality (Karabarbounis & Neiman, 2014; Koeniger & Leonardi, 2007; Checchi & García-Peñalosa, 2008; Jaumotte & Osorio-Buitron, 2015; Dosi et al., 2018; Tridico, 2018; Hager, 2020).

According to Stansbury and Summers (2020), the decline in worker power can account for the entirety of the decline in the labour share. The authors state that the fall in worker's market power is more important for labour share dynamics than the rise in firms' market power (Section 4.8).

4.5 Product Market Concentration

Akin to income inequality, market concentration and markups have persistently increased since the 1980s, with some commentators contending that we are in a “New Gilded Age” (Bartels, 2016; Eeckhout, 2021). According to economic theory, market concentration gives firms greater leverage in wage negotiations (Blanchard, 1986; Blanchard & Giavazzi, 2003; Heylen, 2023). Consistent with theory, empirical research confirms that increasing market concentration indeed leads to lower real wages (Rinz, 2018; Rinz, 2019; Bergholt et al., 2022). Beyond its impact on wages, standard economic models allege that market concentration tends to heighten the natural rate of unemployment (Phelps, 1967; Friedman, 1968a; Lucas & Prescott, 1978, Salop, 1979; Juhn et al., 1991; T, Blanchard & Katz, 1997, Heylen, 2023). Both lower real wages and higher unemployment have an adverse impact on income inequality.

4.6 Fiscal Policy

Neoliberal ideas also claimed that government intervention and redistribution has a detrimental impact (Pasinetti, 2000; Block, 2011). As a result, marginal income tax rates were lowered, social spending was cut back and industries were deregulated (Block, 2011). Unsurprisingly, these measures are cited to have contributed to the upshot in inequality (Anderson, 2017; Saez & Zucman, 2020; Ostry et al., 2014; Lee, 2005; Dabla-Norris et al., 2015). A meta-regression analysis by Anderson et al. (2017) confirms that both the size and structure of government spending significantly influence the dynamics of income inequality.

Austerity measures are also frequently cited to play a role in shaping income inequality. This becomes particularly pertinent in the aftermath of the financial crisis, where numerous OECD countries, particularly within the Eurozone, undertook measures to curtail public spending as a means of stabilising public debt. Fiscal consolidation episodes are associated with a rise in income inequality (Cournède et al., 2013; Rawdanowicz et al., 2012; Woo et al., 2013; Ball et al., 2013; Woo et al., 2017; Agnello & Sousa, 2014; Heimberger, 2020). Rising unemployment and cuts in social security are the most cited channels driving this result (Heimberger, 2020). While the effects do exist, they seem to be relatively modest (approximately a 0.4 percentage point increase in the Gini after a fiscal consolidation episode) (Heimberger et al., 2020; Ball et al., 2013; Agnello & Sousa, 2014).

4.7 Inflation and Monetary Policy

The literature on the impact of inflation on inequality is characterised by two sides, both encompassing many possible channels on how inflation may affect income inequality (Sintos, 2023). On the one hand, there are the prevailing arguments that inflation disproportionately hurts lower-income households as their consumption bundles consist relatively more of price-volatile goods (Sintos, 2023). This is often denoted as “inflation-caused consumption inequality” (Hobijn & Lagakos, 2005; Krueger & Perri, 2006; Aguiar & Bils, 2015; Attanasio & Pistaferri, 2016; Charalampakis et al., 2022).

The other side of the debate is dominated by others contending with the idea that inflation is

more painful for high-income households than it is for low-income households (Sintos, 2023). The argument goes as follows: inflation is often referred to as a tax on money because it is beneficial for debtors, and it hurts creditors by reducing the actual value of outstanding debt (Fisher, 1933). This kind of reasoning can be extrapolated to all kinds of financial assets¹² (Binder, 2019). Not everyone aligns with this line of thinking, such as Easterly & Fisher (2001) and Albanesi (2007) who stress that high-income households are more likely to be highly educated and have more knowledge on how to hedge themselves against inflationary pressures.

Numerous authors posit that the question of whether inflation increases inequality is more nuanced and that both sides of the debate can be reconciled (Jaravel, 2021). A frequently stated claim is that the underlying source (demand versus supply shocks) of inflation that is the most important (Jaravel, 2021). For instance, Romer & Romer (1998) allege that unanticipated demand-caused inflation can reduce unemployment, especially for low-skill individuals. Conversely, supply shocks are more likely to have adverse effects on employment and (inflation-caused consumption) inequality (Hwang, Lee & Yim, 2022). In Subsection 5.8 of this study, I will empirically test the hypothesis that the source of inflation can exhibit different outcomes using local projections.

If inflation indeed exerts an influence on inequality, this may have policy implications. The role of monetary policy on inequality garnered substantial attention in recent years (Kappes, 2023). Empirical research indicates that predominantly contractionary policy is associated with an increase in inequality, while the ramifications of expansionary policy appear less straightforward (Coibion et al., 2017; Furceri et al., 2018; Kappes, 2023). It is noteworthy, however, that the estimated effects of contractionary monetary policy on inequality seem relatively modest (Amaral, 2017; Raczynski, 2022). While monetary policy can elucidate cyclical fluctuations in inequality, it falls short of explaining the persistent upward trend observed since the 1970s (Coibion et al., 2017; Raczynski, 2022).

Note that the adverse consequences of contractionary policy can shed new light on the ongoing discourse on whether inflation exerts a negative impact on inequality. If the cure (contractionary

¹²Inflation can also affect the income distribution through the tax system (Sintos, 2023). Progressive tax scales, when defined in nominal terms, cause high-income earners to be pushed into higher tax brackets as inflation rises, thus reducing after-tax income inequality (Gustafsson & Johansson, 1999). This effect is commonly referred to as “bracket-creeping”.

policy) seemingly amplifies the disease, a cautious approach toward policy intervention might be advised. Follow-up research could benefit from examining both the impact of inflation on inequality and the repercussions of contractionary monetary policy within a unified analytical framework. This is precisely one of the tasks undertaken in subsection 5.8.

4.8 The Rise of Superstar Firms & Executive Pay

The preceding factors may elucidate the rise in the Gini coefficient, yet they encounter challenges in explaining the surge of the Top 1% income share (Hacker & Pierson, 2010). One frequently cited explanation for the concentration at the top is the “Superstars” theory (Kaplan & Rauh, 2013). According to this theory¹³, advancements in information and communication technologies have facilitated the acceleration of productivity among high-ability individuals. (Rosen, 1981). Subsequent innovations¹⁴ in these technologies have further streamlined the ability of “Superstars” to offer their services on a larger scale (Rosen, 1981). For instance, professional athletes can now access a larger audience and investors can acquire information more swiftly and trade larger amounts with greater ease (Rosen, 1981). Globalisation further increases the market size to which “Superstars” can offer their services. The “Superstars” theory can contribute to understanding why the Top 1% has been particularly pronounced in the US, the frontrunner in communication and information technologies, relative to most other OECD countries (Kaplan & Rauh, 2013).

Numerous scholars also attribute the ascent of the Top 1% to executive compensation. The rise in the Top 1% income share has coincided with a notable upswing in executive pay (Mishel & Sabadish, 2012).

Commonly cited explanations for the upsurge in executive pay and other high-level incomes include heightened managerial power (Bebchuk & Fried, 2006), shifts in social norms (Piketty & Saez, 2006; Levy & Temin, 2007), changes in marginal tax rates (Piketty & Saez, 2006), increased political organisation of the affluent (Hacker & Pierson, 2010), and the “Superstars” theory (Rosen, 1981).

¹³However, empirical evidence testing the “Superstars” theory remains scarce.

¹⁴Jones & Kim (2018) underscore that the institutional environment also has undergone transformations, contributing significantly to the heightened success of “Superstars” and rapidly expanding entrepreneurs.

4.9 Demographic Ageing: The Retirement Wave of the Baby Boom Generation

While less prominent in the literature, demographic ageing of the baby boom generation is cited to have contributed to heightened income inequality through four distinct channels (Dolls et al., 2019). (1) An elevated proportion of retirees within the population amplifies income inequality since retirees typically experience a reduction in income upon retirement (Repetto, 1978; Galasso & Profeta, 2007). (2) The increasing vote share of retirees may impact income inequality if retirees vote in favour of their own economic interests at the expense of younger generations (Willetts, 2010; Munger, 2022). For instance, retired homeowners might support policies aimed at boosting property values while limiting rises in property taxes. (3) A heightened dependency ratio is likely to exert significant pressure on public provisions (Dolls et al., 2019). (4) Labour scarcity due to demographic ageing may encourage the adoption of automation technologies (Acemoglu & Restrepo, 2022; Jacobs & Heylen, 2024).

Table 1 summarises the effects of the drivers discussed in the previous subsections, based on both theoretical and empirical evidence.

Table 1: Summary of the drivers of income inequality from theory and empirical evidence

Driver	Theory	Empirical evidence
Trade Globalisation	Positive	Positive (but small)
Financial Globalisation	Positive	Positive
Financial Deepening	Debated	Debated
Technological Change	Positive	Positive
Labour Market Deregulation	Positive	Positive
Product Market Concentration	Positive	Positive
Cutting back the Welfare State	Positive	Positive
Inflation and Monetary Policy	Debated	Debated
The Rise of Superstar Firms & Executive Pay	Positive	Few studies outside the US
Demographic Ageing	Positive	Few studies

5 Empirical study

5.1 Data and Methodology

In this section, my objective is to empirically examine the significance of the potential drivers outlined in Section 4, in explaining the upward trend in inequality since the 1970s. The analysis is based on an (unbalanced) panel data set covering 35 OECD countries¹⁵ from 1970 to 2020¹⁶. By exploiting both time and cross-sectional variation, I aim to address other variables not explicitly incorporated in the model such as the global business cycle, the rise in firms' market power, the Yom-Kippur War of 1973 and the Iranian Revolution of 1979, China's entry to the WTO, the fall of the Soviet Union, banking crises, the rise of "Superstars", the increase in managerial power, female emancipation, urbanisation, shifts in cultural norms, and more. I hope to tackle the cross-country differences of both the incorporated variables and the unincorporated variables, as well as the evolution over time. Furthermore, I also control for the heterogeneous impact on individual countries of these time-varying unobserved common factors using a Common Correlated Effects (CCE) estimator.

In my panel analysis, I consider multiple inequality indicators as the dependent variable to check for robustness. Specifically, I will employ the Gini coefficient of disposable income (NETGINI), the ratio of the income share of the Top 10% (TOP10) to the Bottom 20% (BOTTOM20), and the Gini coefficient of market income (MARKETGINI). It is important to note that data for the last indicator is only available for 21 countries and from the 1980s onward. Consistent with the empirical literature, the Gini coefficient pertaining to disposable income will be the main focus.

In selecting my explanatory variables, I rely on the potential drivers identified in the literature, as discussed in Section 4. Unfortunately, due to very limited data availability, I am unable to address the "Superstar" theory, fiscal stabilisation policy, and product market concentration. In the following paragraphs, I elaborate on the indicators I used as proxies for various potential drivers. A precise definition of these indicators and their respective sources are available in

¹⁵Except for Colombia, Costa Rica, and Lithuania, all OECD countries. Social spending data were not available for these three countries.

¹⁶Since data for many of my explanatory variables are only available up to 2020, I am unable to study the most recent years.

Table 2.

All percentage-based indicators are presented as values ranging from 1 to 100. Likewise, all indexes were multiplied by 100. I used linear interpolation for missing values, and, in some instances, linear extrapolation and using data from other sources for some specific variables for some years.

Appendix 1.12 contains several summary statistics pertaining to the dataset.

Globalisation

Trade globalisation is proxied by the sum of imports and exports of goods and services as a share of GDP (OPEN)¹⁷. Financial globalisation, on the other hand, is proxied by the KOF index¹⁸ of financial globalisation (KOF). The KOF index is an index developed by the Swiss Economic Institute that ranges from one to 100 and is derived by taking the weighted average of foreign direct investment, portfolio investment, international debt, international reserves, and international income payments.

In line with Section 4.1, I anticipate that both indicators will exert an upward influence on the Gini coefficient.

Financial Deepening

Alongside the KOF index of financial globalisation, I include total financial system deposits as a share of GDP to capture financial market development (DEPOSITS)¹⁹. As mentioned in 4.2, the effect of financial deepening may exhibit either a positive or negative effect. Consequently, I will make no a priori predictions about the anticipated direction of the deposits variable.

Level of Technology

The level of technology is very hard to measure (Cavdar & Aydin, 2015). Numerous indicators have been proposed in the literature. The most frequently used indicator is Total Factor Productivity (Van Beveren, 2012). Total factor productivity refers to the proportion of output that

¹⁷Most studies use trade openness as an indicator for trade globalisation (Asteriou et al., 2014; Jaumotte et al., 2013, Dabla-Norris et al., 2015)

¹⁸The KOF index is also used by Bergh & Nilsson (2010).

¹⁹This variable is also used by Alexiou et al. (2022)

Table 2: Data description CCE estimator

Indicator	Description	Data Source	Period
MARKETGINI	Gini index of distribution of income before taxes and transfers	Standardized World Income Inequality Database (SWIID)	1980-2020
NETGINI	Gini index of distribution of income after taxes and transfers	UNU-WIDER database	1970-2020
TOP10	Share of net income accruing to the highest decile of the income distribution	UNU-WIDER database	1970-2020
BOTTOM20	Share of net income accruing to the lowest quintile of the income distribution	UNU-WIDER database	1970-2020
GDPCAPITA	Real GDP per capita based on constant local currency	UNU-WIDER database	1970-2020
OPEN	Total volume of exports & imports of goods and services as a % of real GDP	World Economic Outlook	1970-2020
UNION	Trade union density in percentage of employees	OECD/ICTWSS database	1970-2020
KOF	KOF (financial) globalisation index (de facto)	Swiss Economic Institute	1970-2020
SCHOOLING	Average number of total years of schooling	Barro-Lee education attainment dataset	1970-2020
DEPOSITS	Financial system deposits to GDP (%)	World Bank Global financial development database	1970-2020
<i>Inflation</i>	Inflation, consumer prices (annual%)	World Bank's World Development Indicators database	1970-2020
TFP	Total factor productivity at current PPPs (2017=100)	Penn World Table (version 10.01)	1970-2020
DEPEN	Age dependency ratio, old (% of working-age population)	World Bank's World Development Indicators database	1970-2020
SOCIALSPENDING	Public social spending as a share of GDP	Our world in data based on OECD and Lindert (2004)	1970-2020
REV	Government revenue (in % GDP)	IMF Public Finances in Modern History dataset	1970-2020

cannot be explained by traditionally measured inputs such as labour and capital. Because of its wide use in the empirical literature and its intuitive computation, I will include the level of TFP as a proxy for technology (TFP).

While Total Factor Productivity (TFP) itself is neutral regarding skill, a positive coefficient for TFP would indicate that technological progress since the 1970s has contributed to increased inequality. To ensure the reader I effectively capture the effects of skill-biased technological change, I also include an interaction term between TFP and the average number of total years of schooling (SCHOOLING). Should TFP exhibit a positive sign in isolation while the interaction term has a negative sign, then this signals the presence of skill-biased technological change. This would suggest that having a more skilled labour force accommodates the increased demand for skilled employees, consequently reducing the rise in skill premiums. Therefore, I anticipate a positive coefficient for TFP and a negative coefficient for the interaction term. Roser & Cuaresma (2016) also incorporate an interaction term between TFP and human capital in their analysis.

Labour Market Institutions

To proxy labour market institutions, I first opted to use an average of firing & hiring and collective bargaining indexes provided by the World Economic Forum. However, the more extensive data availability of union density, coupled with its high correlation with the previously mentioned indexes, renders union density a more favoured indicator. Consequently, I include trade union density²⁰ as a proxy for labour market institutions (UNION). I expect union density to have a dampening effect on inequality, as put forward by theory and empirical work.

Government Social Policy

I chose to include public social spending as a share of GDP as an indicator of government social policy. The public social spending indicator I employ includes, among others, the following expenditure categories: health, pensions, incapacity-related benefits, family, active labour market programs, unemployment, and housing. Intuitively, I expect public social spending (SOCIAL-SPENDING) to have a tempering influence on the Gini coefficient. To account for the financing

²⁰Union density is also used by Jaumotte & Buitrion (2020), Herzer (2016), Checchi & Garci-Penalosa (2008), Sauer et al. (2023) and others.

mechanisms underlying public spending, I also incorporate the total government revenues²¹ to GDP ratio (REV). Since my social spending indicator encompasses pensions as well, it further justifies the inclusion of ageing in my specifications. A larger share of retirees means a greater portion of social spending must be allocated to retirement benefits.

Inflation

I include the log of INFLATION in my specifications because some countries in my dataset experienced hyperinflation. I first reformulated inflation by expressing it as $INFLATION = 1 + \frac{Inflation}{100}$ for each year²².

As emphasized in detail in Section 4.8, a consensus regarding the directional impact of inflation (INFLATION) on inequality remains absent. A more thorough exploration of the dynamics between inflation and inequality will be undertaken in subsection 5.8.

Ageing

Ageing is represented by including the ratio of older people (64+) in proportion to the working-age population (15-64) (DEPEN). I expect ageing to exert an upward influence on inequality.

Additionally, I incorporate log(GDPCAPITA) as a control variable to enhance the precision of isolating the effects of the drivers and mitigate potential omitted variable bias.

5.2 Identification

From a theoretical point of view, it is very challenging to justify the absence of (time-invariant) heterogeneity in a panel with countries as cross-sectional units. Given that countries differ in so many characteristics, some countries will always experience higher inequality levels than others. Simply stacking data over time and cross-section units, such as done in pooled OLS, will almost certainly lead to highly inconsistent and/or²³ inefficient²⁴ estimators. Empirically, we can test the significance of (time-invariant) heterogeneity by comparing a fixed effects model to

²¹Roser & Cuaresma (2016) also include this variable in their analysis.

²²An inflation rate of 5% translates to 1.05 in the INFLATION variable.

²³If the individual effects are uncorrelated with the error terms, pooled OLS can still be consistent (provided that the explanatory variables are weakly exogenous).

²⁴If individual effects are present, they will induce autocorrelation.

a pooled OLS model, using an F-test. I conducted this F-test for a model with NETGINI as the dependent variable. The F-test rejects the null hypothesis of no (time-invariant) heterogeneity and favours the fixed effects model.

Theoretical considerations also provide strong motivation for a significant correlation between the (time-invariant) country-fixed effects, such as cultural characteristics²⁵, and the error terms. Given that a random effects estimator assumes no correlation between the country-fixed effects and the error terms, a fixed effects model emerges as a more preferable estimator. This reasoning is supported by the Hausman test I conducted on the model with NETGINI as the dependent variable. The Hausman test (1978) strongly rejects the null hypothesis of no correlation between the country-fixed effects and the included explanatory variables.

If the objective is to perform standard inference, it is essential to investigate the potential existence of cross-sectional dependence. Neglecting cross-sectional dependence can result in biased standard errors and significant size distortions in (first-generation) panel unit root tests. The Pesaran CD test (2004) rejects the null hypothesis of no cross-sectional dependence for all variables (both in levels as in first differences). The presence of cross-sectional dependence is likely induced by a heterogeneous impact of time-varying common factors such as the global business cycle, the surge in firms' market power, banking crises, the rise of "Superstars", the increase in managerial power, and other factors. Traditional time-fixed effects assume a homogeneous impact²⁶ of time-varying common factors. To study the impact of unobserved time-varying factors and their individual effects, I adopt a common correlated effects approach. The specifications listed in Table 3, aim to proxy a common correlated effects pooled estimator (CCEP) with country-specific individual loadings. To proxy unobserved common factors, I include a dummy for each country interacted with the dependent variable's values for the United

²⁵Cultural attitudes towards inequality could for example be correlated with social spending levels.

²⁶Since these unobserved common factors could be non-stationary, applying homogeneous effects across all countries may leave substantial non-stationarity in the residual error term of individual countries to survive.

States^{27,28,29} (Equation 18). The reasoning goes as follows: if there are unobserved time-varying common factors that have an impact on inequality (y_{it}), then these factors will also affect inequality levels in the US ($y_{USA,t}$). Furthermore, only the increase in inequality in the US not captured by the other explanatory variables (X_{it}) is explained by this variable, as the inclusion of the other explanatory variables already captures their effects. The individual factor loadings (dummies for all the countries; δ_i) capture the heterogeneous impact of these unobserved factors on the other countries.

$$y_{it} = \alpha_i + \Gamma X_{it} + \delta_i y_{USA,t} + \epsilon_{it} \quad (18)$$

5.3 Time Series Properties of the Data

I test for autocorrelation using both the Breusch-Pagan LM test (1979) and the Durbin-Watson test (1950). Both tests strongly reject the null hypothesis of no autocorrelation in the error terms for all the specifications listed in Table 3. Upon these findings, I decided to correct for autocorrelation (and heteroskedasticity) using a Newey-West (1986) correction³⁰. I refrained from including lags³¹ due to ambiguity regarding the underlying causes of this autocorrelation. It could be the case that it takes time for inequality levels to adjust toward their new equilibrium after shifts in the drivers of inequality (the explanatory variables). Alternatively, omitted variables could also induce the observed autocorrelation. Another factor to take into account is the possibility that the autocorrelation detected by the two autocorrelation tests could be Type I errors. Given the substantial number of observations (1,235), the autocorrelation tests exhibit

²⁷In Pesaran's (2006) standard CCEP approach, rather than using the value of the dependent variable of a single country as the common factor variable, cross-sectional averages of all explanatory variables are employed. However, this method demands estimating a substantial number of parameters. Although my dataset is already very comprehensive, it lacks the necessary number of observations to adequately offset the reduction in degrees of freedom resulting from such an approach.

²⁸In the new specification, I removed the time fixed-effects to fully capture the impact of time-varying common factors.

²⁹As I rely on the values of the dependent variable for the US, the data pertaining to the US becomes unusable. 34 countries remain.

³⁰Alternatively, I employed another correction proposed by Driscoll & Kraay (1998) to adjust the standard errors to address cross-sectional dependence. The Driscoll and Kraay corrected errors closely mirrored those corrected by Newey-West. Across all four specifications, there is not a single variable whose significance level change exceeds 1% when using Driscoll and Kraay corrected errors instead of Newey-West corrected errors, and all significant variables retain their significance.

³¹Including dynamics in a panel data model with country-fixed effects also implies an endogeneity problem, as the error terms become automatically correlated with the lagged (dependent) variable(s) (Nickell, 1981).

very high levels of statistical power. Upon visual inspection, the error terms exhibit a stable yet erratic pattern, characterised by a mean of zero and a relatively low standard deviation. Moreover, the corrected errors are almost identical to the original standard errors, and for some coefficients, even exactly identical.

Taking into account the evolution and characteristics of both the dependent variable and some of the explanatory variables, it is important to test for the order of integration of the dependent variables and the explanatory variables³².

$$\Delta y_{it} = \alpha_i + \gamma_i y_{i,t-1} + \sum_{j=1}^J \phi_{ij} \Delta y_{i,t-j} + \epsilon_{it}$$

$$H_0 : \gamma_i = 0 \text{ for all } i$$

$$\begin{cases} H_1 : \gamma_i = 0 \text{ for all } i = 1, \dots, N_1 \\ H_1 : \gamma_i < 0 \text{ for all } i = N_1, \dots, N \end{cases}$$

$$\text{with } \lim_{N \rightarrow \infty} N_1/N = \delta \text{ where } 0 < \delta \leq 1$$

The unit root hypothesis $\gamma_i = 0$ can be tested on the N individual time series individually, but this may lack power. Making use of the panel dimension will increase power. The Maddala-Wu (1999) panel unit root test, an often-used panel unit root test, strongly rejects the null hypothesis of non-stationarity for all variables. However, it is essential to recognise that this test is a first-generation panel unit root test. First-generation panel unit root tests suffer from non-trivial size distortions when there is cross-sectional dependence in the panel data frame. Second-generation panel unit root tests, on the other hand, such as the Hanck (2013) test, take cross-sectional dependence into account and do not suffer from size distortions.

Hanck (2013) proposed to combine the p-values from time series unit root tests on the different units of the panel according to an analytic combination procedure. First, an ADF unit root test is performed on the values of a variable for all cross-sectional units. Secondly, all the p-values are retrieved and sorted from lowest to highest. Thirdly, all p-values are compared to a critical

³²Many studies, including those by Jaumotte et al. (2013), Dabla-Norris et al. (2015), and Asteriou et al. (2014), do not test for unit roots and cointegration. However, if the data are non-stationary, the regression results will be spurious unless there is cointegration.

value that depends on the considered p-value's order in the list of p-values. If the p-values are smaller than their critical value for at least some cross-sectional units, we can reject the null hypothesis of a unit root. The critical values can be computed as $j \cdot \alpha / n$ with j standing for the rank of the p-value, α for the significance level, and n for the number of cross-sectional units in the panel. The big advantage of the Hanck unit root test is that it takes cross-sectional dependence into account.

Since the Pesaran CD test signalled cross-sectional dependence, I decided to use the Hanck test. The Hanck test is not able to reject the null hypothesis of non-stationarity for NETGINI, TOP10/BOTTOM20, MARKETGINI, GDPCAPITA, TFP, SCHOOLING, OPEN, KOF, DEPOSITS, DEPEND at the 10% significance level.

The results from the unit root tests have important consequences. In the absence of cointegration, the regression will be spurious, and we cannot do standard inference. Considering our objective is to test the significance of the different drivers, and thus standard inference, it is important to test for cointegration. In the context of a panel model, the null hypothesis of no cointegration is rejected when non-stationarity is rejected for the error terms of at least some countries. Conducting the Hanck test on the error terms, I find that the null hypothesis of no cointegration is rejected at the 10% significance level for all the CCE specifications and fixed-effects specifications I estimated.

Additional information regarding the unit root tests and cointegration tests is available in Appendix 1.1.

5.4 Results

In the context of the CCE specification for NETGINI, all variables apart from DEPEND and SOCIALSPENDING are significant at the 10% significance level or better. Notably, the outcomes of the TOP10/BOTTOM20 are remarkably similar to those of the NETGINI specification, with all coefficients, apart from SOCIALSPENDING, maintaining the same sign across both specifications. Moreover, all variables significant in the NETGINI specification remain significant in the TOP10/BOTTOM20 specification.

Table 3: Common correlated effects specifications

	<i>Dependent variable:</i>			
	NETGINI	TOP10/BOTTOM20	MARKETGINI	NETGINI ³³
	(1)	(2)	(3)	(4)
log(GDPCAPITA)	−4.584*** (0.724)	−1.442*** (0.293)	−3.940*** (1.170)	−3.882*** (0.835)
log(INFLATION)	−2.521** (0.979)	−1.121** (0.514)	−7.689*** (1.950)	−2.204** (1.034)
TFP	0.124*** (0.042)	0.047*** (0.012)	0.061 (0.080)	0.107** (0.045)
SCHOOLING	−0.474** (0.192)	−0.203** (0.085)	0.016 (0.336)	−0.590*** (0.214)
TFP * SCHOOLING	−0.016** (0.007)	−0.009*** (0.002)	−0.017* (0.012)	−0.013* (0.008)
OPEN	0.029** (0.015)	0.010*** (0.003)	0.049* (0.028)	0.032* (0.017)
KOF	0.042*** (0.010)	0.009*** (0.002)	0.050*** (0.014)	0.036*** (0.011)
DEPOSITS	0.008** (0.004)	0.003*** (0.001)	0.012* (0.007)	0.007* (0.004)
UNION	−0.087*** (0.017)	−0.019*** (0.005)	0.004 (0.027)	−0.105*** (0.022)
SOCIALSPENDING	−0.017 (0.019)	0.004 (0.006)	−0.011 (0.017)	−0.018 (0.019)
REV	−0.081*** (0.014)	−0.017*** (0.004)	−0.030 (0.035)	−0.075*** (0.015)
DEPEN	0.0004 (0.029)	0.008 (0.008)	−0.009 (0.070)	0.046 (0.032)
Observations	1,235	1,235	756	987
R ²	0.647	0.480	0.802	0.675
Adjusted R ²	0.623	0.444	0.787	0.655

³³The fourth specification is the specification that does not include the “new” OECD members.

Note: The reported standard errors are corrected using a Newey-West (1986) correction.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

The negative sign of the $\log(\text{GDPCAPITA})$ variable suggests that more developed countries tend to experience lower levels of inequality. Furceri et al. (2019) also draw this conclusion. The coefficient of $\log(\text{GDPCAPITA})$ indicates that a 10% increase in GDPCAPITA is associated with a 0.4584 percentage-point reduction in NETGINI .

The positive coefficient of TFP suggests that technological advancement correlates with higher inequality³⁴. Without a concurrent rise in the supply of skilled labour (proxied by SCHOOLING), the increase in inequality caused by TFP is considerably higher. The negative coefficient of SCHOOLING in isolation implies that even in the absence of skill-biased technological change (SBTC), a greater proportion of skilled labour in the workforce tends to lower skill premiums. The interaction term solely focuses on the interplay between SCHOOLING and TFP . The interaction term also indicates that an additional year of average total schooling reduces inequality more when TFP is high.

The positive coefficients of OPEN and KOF seem to support the hypothesis that (trade and financial) globalisation is a driver of income inequality in developed countries. The coefficient of OPEN (KOF) indicates that a one-percentage-point increase in trade openness (the KOF index) is associated with a 0.029 (0.042) percentage-point increase in NETGINI . These findings align with the meta-regression conducted by Heimberger (2020). Financial deepening (DEPOSITS) also seems to have been a driver of income inequality. A one-percentage-point increase in financial system deposits to GDP (%) is associated with a 0.008 percentage-point increase in NETGINI . This aligns with the conclusions drawn by Jaumotte et al. (2013) and Furceri et al. (2019), but contrasts the results reported by Hamori & Hashiguchi (2012).

The negative coefficients observed for UNION , SOCIALSPENDING (excluding the TOP10/BOTTOM20 specification), and REV support the notion that institutional changes and fiscal policies play a significant³⁵ role in explaining disparities in inequality over time. A one-percentage-point increase in public spending as a share of GDP is associated with a 0.017 percentage-point (insignificant) reduction in NETGINI . The coefficient of REV indicates that a one-percentage-point increase in government revenues as a share of GDP is associated with a 0.081 percentage-

³⁴Most econometric studies also confirm that technological change is associated with higher income inequality in OECD countries (Jaumotte et al., 2013; Asteriou et al., 2014; Dabla-Norris et al., 2015; Peters & Volwahren, 2017; Furceri et al., 2019).

³⁵Only significant for REV .

point reduction in NETGINI. This is in line with other empirical studies (Alexiou et al., 2022; Checchi & Garcia-Penalosa, 2008; Anderson et al., 2017; Jaumotte & Buitron, 2020; Sauer et al., 2023). The decline in workers' bargaining power, represented by UNION, is likely associated with decreased wages as a one-percentage-point reduction in union density is associated with a 0.087 percentage-point increase in NETGINI.

I do not find evidence suggesting that demographic ageing has resulted in an (independent) increase in income inequality. In none of the specifications I estimated did I observe a significant coefficient for DEPEND.

In the MARKETGINI specification, three coefficients (of SCHOOLING, UNION & DEPEND) switch signs, although they are very insignificant. TFP and REV also lose their significance in the MARKETGINI specification but maintain the same sign. All the significant variables keep their sign. It is, however, important to recognise that the MARKETGINI specification is estimated with much fewer observations, as data for the dependent variable was only available for 21 countries and from 1980 onward.

Overall, the findings exhibit fairly strong robustness when considering different dependent variables. Across all three specifications, the significant variables appear to have the theoretically predicted sign, excluding the variables for which economic theory was inconclusive. This is certainly the case for the NETGINI specification, in which all variables exhibit the expected sign. This is in contrast to the standard fixed effects specifications, outlined in Appendix 1.2., for which the results are more disappointing. Multiple variables in all three specifications display signs that oppose theoretical predictions, even significantly in the case of SOCIALSPENDING.

The motivation for employing a CCE estimator is further strengthened by the high significance of the unobserved common factor variable for most countries. Specifically, among the 34 countries examined, the unobserved common factor variable is significant for 26 countries, with significance levels consistently below 1% for 24 countries (in the NETGINI specification). Merely in the case of 8 countries is the unobserved common factor variable not significant at the 10% level.

Although the unobserved common factor variable exhibits a positive sign for most countries, it displays a negative sign for 10 countries (for the NETGINI specification). This implies that the influence of unobserved common factors on inequality levels does not uniformly lead to higher levels of inequality across all countries³⁶. The average coefficient for the unobserved common factor variable across countries equals 0.1796. The relatively high standard deviation of 1.1465 underscores significant cross-country differences in the impact of unobserved common factors on inequality levels.

It is plausible that certain determinants may display non-linear relationships, such as diminishing or increasing effects. To explore this possibility, I estimated eleven additional specifications for NETGINI, incorporating the squared term of a distinct explanatory variable in each specification. Among these variables, SCHOOLING, KOF, UNION, and OPEN appear to exhibit non-linear effects. Except for SCHOOLING, these variables demonstrate increasing effects as their values rise. The introduction of non-linear effects only marginally increases the R-squared of the specifications involving these variables, with the most notable (albeit small) increase observed for the non-linear effects of UNION. The results are provided in Appendix 1.3. As the model fit does not substantially improve following the inclusion of non-linear effects, I proceed with the base model.

To make sure the significant negative sign of $\log(\text{INFLATION})$ is not driven by taking a logarithmic transformation, I also estimate a NETGINI CCE specification with *Inflation* directly. The findings, presented in Appendix 1.4, closely mirror those obtained from the original CCE NETGINI model. The coefficient of inflation is still significantly negative. The only notable change is the alteration in sign for DEPEND, although DEPEND is very insignificant.

Next, I test for the presence of a structural break in inequality dynamics following the 2008 financial crisis. From empirical observation, it follows that inequality rose in the aftermath of the financial crisis, marked by a strong rebound for the Top 10% (Piketty, 2013; Fadda & Tridico,

³⁶The unobserved common factors variable may also encompass factors that are closely associated with the included explanatory variables but not identical to them. For instance, in all countries included in this analysis, Revenues as a share of GDP has increased over time; however, the (evolution of the) progressivity of the tax system may be very different across countries. Another illustration is the lack of differentiation in OPEN between trade with other developed countries and trade with developing countries. While trade with developing countries is often thought to exert downward pressure on wages for low-skilled workers, trade with other developed nations is believed to have the opposite effect, potentially increasing wages.

2017, Glei et al., 2019). Numerous scholars posit that the Great Recession may have induced hysteresis effects on structural macroeconomic factors (Stiglitz, 2015; Rothstein, 2017; Yagan, 2019; Bergholt et al., 2022; Carreno, 2023). I test this possibility for inequality drivers by conducting an F-test between a model that spans my whole dataset and a model that excludes the years post-2007. I applied this F-test to both the NETGINI specification and the TOP10/BOTTOM20 specification. In both instances, the F-test could not reject the null hypothesis of no significant differences. Consequently, I do not find evidence that the influence of the included inequality drivers differs from 2008 onward.

To test whether the outcomes of my analysis are not predominantly influenced by the “new” OECD members, which frequently exhibit extreme values in certain explanatory variables such as hyperinflation, I estimate a distinct NETGINI CCE specification for the “old” OECD members. The fourth column of Table 3 displays a NETGINI CCE specification solely for OECD countries that were already members before 1990. Despite excluding so many countries, the results are about the same.

As countries are different in so many characteristics, this may lead to varying responses to the same set of explanatory variables. Following this slope heterogeneity reasoning, I allow for slope heterogeneity by estimating a CCE mean group estimator for the NETGINI specification. The results are presented in Appendix 1.5. All variables, except DEPEN, retain their signs. Nonetheless, in the mean group specification, only SCHOOLING, log(GDPCAPITA), and UNION remain statistically significant. All other variables exhibit very low levels of significance. It is, however, important to acknowledge that employing a CCE mean group specification consumes a considerable number of degrees of freedom, resulting in less efficient estimators. Given this concern, I opt to proceed with the base model.

As another robustness check, I substitute the average number of total years of schooling (SCHOOLING) with the average years of tertiary schooling (TERT). Some readers may be concerned that the observed increase in the average number of total years of schooling (SCHOOLING) is primarily driven by more individuals completing secondary education rather than enrolling in tertiary education to pursue high-skilled professions. The results can be found in Appendix 1.6. While TERT does not exhibit the expected sign, it is, however, statistically insignificant.

The interaction term, on the other hand, maintains the expected sign and remains significant. DEPEND also changes direction, albeit insignificantly once again.

Four additional robustness tests are presented in Appendix 1.7. The first column displays the outcomes derived from a CCE specification incorporating an additional inequality measure denoted as SD (Standard Deviation). SD is an indicator of how dispersed (disposable) incomes are around the mean (disposable) income. The primary difference compared to the NETGINI CCE specification is the positive sign of the interaction term, although the interaction term is very insignificant. Otherwise, the findings are consistent with the NETGINI specification. The second column displays the results following a natural logarithm transformation of the NETGINI variable. DEPEND turns negative, but again not significantly. The remaining results remain consistent with those of the base specification. The third column presents the results after including four lags³⁷ of the dependent variable (NETGINI). Notably, DEPEND changes sign once more, though it remains very insignificant. In the final column, the outcomes are depicted when using Belgium's NETGINI as the unobserved common factors variable, instead of the NETGINI from the US. OPEN and SOCIALSPENDING switch signs, although both are very insignificant. However, the remaining results remain in line with the base CCE specification, where the US's NETGINI serves as the unobserved common factors variable.

In a cointegration relationship specification, the concern regarding explanatory variables potentially correlated with error terms is largely dismissed. This is because the explanatory variables are $I(1)$ while the error terms are $I(0)$, theoretically suggesting a weak relationship between them³⁸. However, this assumption does not hold for the stationary explanatory variables like INFLATION, UNION, SOCIALSPENDING, and REV. To mitigate potential specification issues stemming from the correlation between error terms and these $I(0)$ variables, I employ an additional NETGINI specification. This new specification involves using three lagged values of all $I(0)$ explanatory variables as internal instruments³⁹ for the stationary variables. The results are presented in Appendix 1.8. SCHOOLING, DEPOSITS, and SOCIALSPENDING exhibit changes in signs, yet none of them are statistically significant. One other noteworthy ob-

³⁷Lag selection is based on Bayesian-Schwartz information criteria (BIC).

³⁸Of course, this implies that the results of the unit root tests should be undoubtedly correct, which is a strong assumption.

³⁹For all instruments, the Wald test rejected the null hypothesis of no relevancy. The F-statistics from all Wald tests surpass the benchmark value of 10 suggested by Staiger and Stock (1994).

servation is the increased negative coefficient for $\log(\text{INFLATION})$. Otherwise, the outcomes resemble those of the initial NETGINI specification. Consequently, it appears that the potential correlation between the $I(0)$ variables and the error terms does not substantially affect the results of the base NETGINI specification.

5.5 Goodness of fit

Although the value of the (adjusted) R-squared of the NETGINI specification is fairly strong (0.623), it is quite conceivable that the model's goodness of fit is primarily induced by the unobserved common factor variable with country-specific coefficients.

In this subsection, I examine the effectiveness of the 'economic' variables of the NETGINI CCE estimator in explaining variations in the Net Gini coefficient across countries and over time. This analysis is undertaken by assessing the model's capability to account for the Gini coefficient's level in 2001 and its ability to predict changes in the Gini coefficient spanning the period 2001-2016.

The former is conducted by relating the model's predicted Gini coefficient for each country in deviation from the average predicted Gini coefficient to the country's actual Gini coefficient in deviation from the actual average of the Gini coefficient in the sample (Figure 7)⁴⁰. The latter is performed by relating the model's predicted change in the Gini coefficient for each country in deviation from the average predicted change in the Gini coefficient to the country's actual change in the Gini coefficient in deviation from the actual average change in the Gini coefficient in the sample (Figure 7)⁴¹. Notably, the predictions in both figures exclusively rely on 'economic' variables, excluding country-fixed effects and unobserved common factors with individual country loadings.

Figure 6 illustrates that the NETGINI CCE specification demonstrates remarkably good explanatory power for the NETGINI in levels. With a correlation of 0.7246 and a trend line (de-

⁴⁰Figure 6 thus examines the correlation between $(\widehat{NETGINI}_i - \overline{\widehat{NETGINI}})$ and $(NETGINI_i - \overline{NETGINI})$.

⁴¹Figure 7 thus examines the correlation between $(\Delta\widehat{NETGINI}_i - \overline{\Delta\widehat{NETGINI}})$ and $(\Delta NETGINI_i - \overline{\Delta NETGINI})$.

picted in red) not too far⁴² from the 45° line (represented by the dashed line), we can conclude that the model performs well in explaining cross-country differences in inequality (in disposable income).

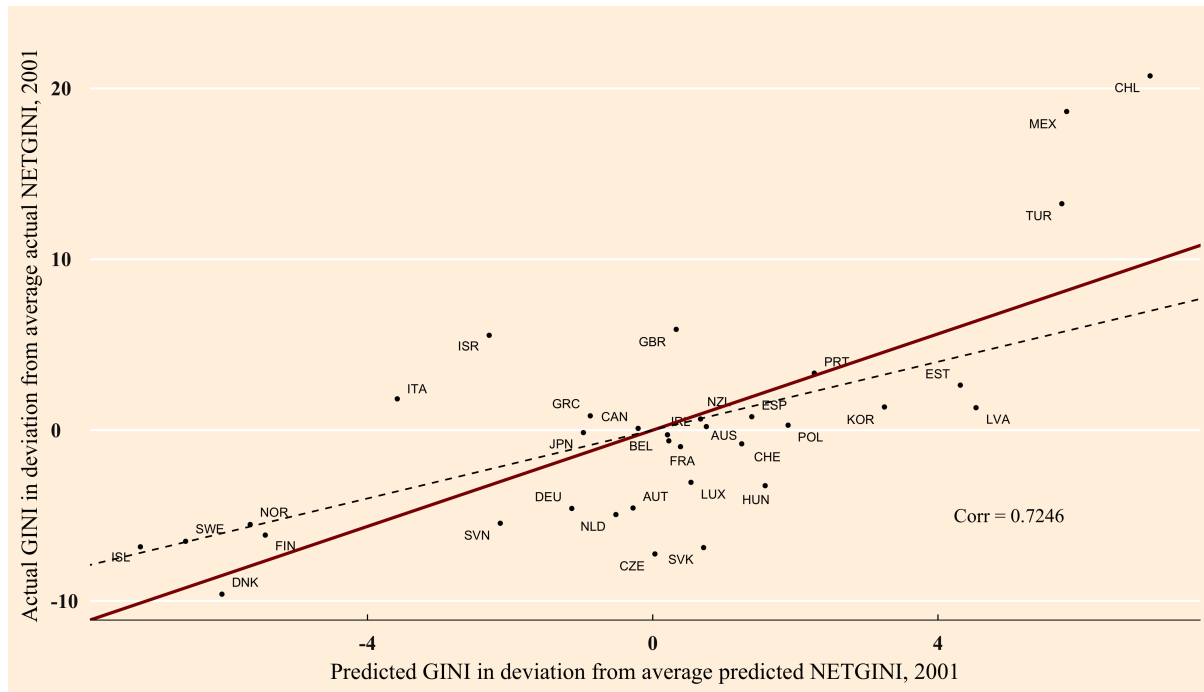


Figure 6: Actual and predicted NETGINI coefficient: Levels, 2001

Source: Own calculation

Figure 7 demonstrates that the CCE specification for the NETGINI is not only capable of explaining cross-country differences in the level of inequality in disposable income but also in changes over time of inequality in disposable income. Even though the correlation drops to 0.5018, the slope of the trend line aligns a bit more closely to the 45° line, with a value of 1.2272.

⁴²The trendline has an intercept of -0.2449 and a slope of 1.4086.

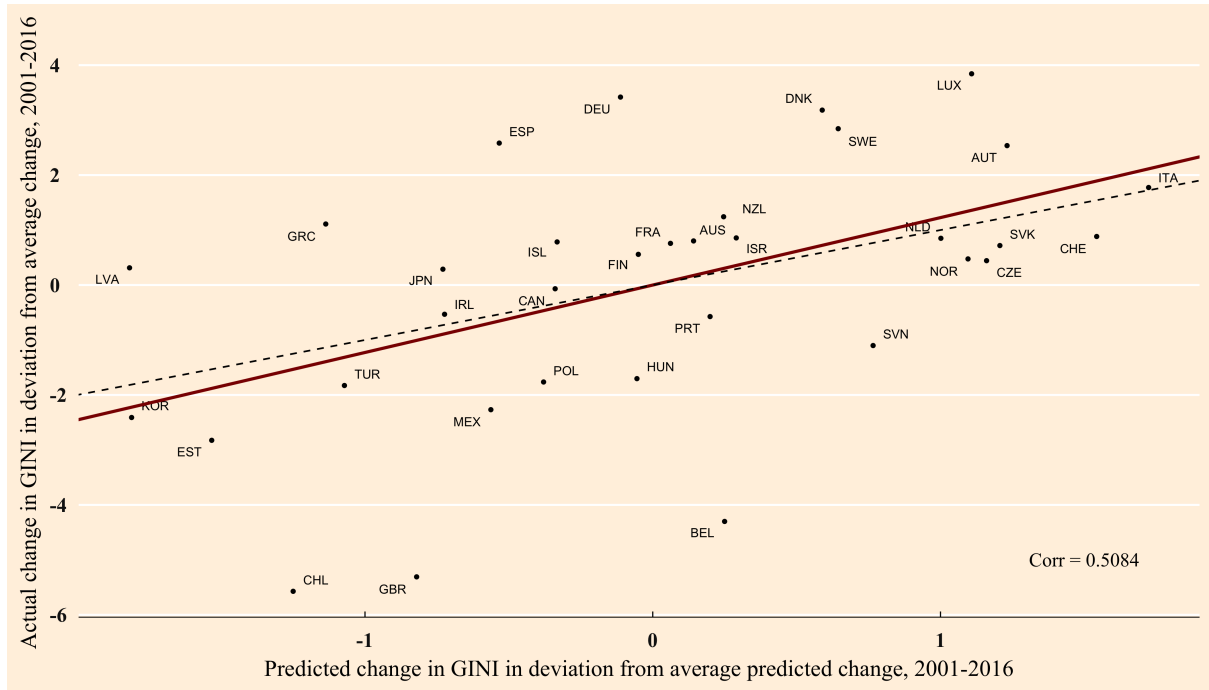


Figure 7: Actual and predicted NETGINI coefficient: Changes, 2001 versus 2016

Source: Own calculation

5.6 Direction of Causation

Finding a cointegration relationship is no proof that the causality runs from X to Y. Causality could run in both ways. As discussed in Section 4, numerous studies find an impact of inequality on economic growth, savings behaviour, etc. In this subsection, I examine which direction in my cointegration relationship is the strongest, and thus whether the cointegration relationship is indeed largely due to a causal impact of the explanatory variables in my model.

To determine if the long-term coefficients derived from the estimated cointegrated relationships presented in Table 3 can be considered causal effects, I employed a causality test⁴³ based on the methodology developed by Eberhardt and Teal (2013) and Canning and Pedroni (2008). This approach builds upon the Granger representation theorem (Engle & Granger, 1987).

According to the Granger representation theorem, when a cointegration relationship exists between variables, the series can be expressed in the structure of a dynamic Error Correction Model (ECM). In general, for a set of cointegrated variables x and y , we can express it as follows:

⁴³Herzer (2016) also employs this causality test to examine the effect of de-unionisation on inequality.

$$\Delta y_{it} = \alpha_{1i} + \lambda_{1i}\hat{\epsilon}_{i,t-1} + \sum_{j=1}^J \phi_{11ij}\Delta y_{i,t-j} + \sum_{j=1}^J \phi_{12ij}\Delta \tilde{x}_{i,t-j} + \nu_{1it}$$

$$\Delta x_{it} = \alpha_{2i} + \lambda_{2i}\hat{\epsilon}_{i,t-1} + \sum_{j=1}^J \phi_{21ij}\Delta y_{i,t-j} + \sum_{j=1}^J \phi_{22ij}\Delta \tilde{x}_{i,t-j} + \nu_{2it}$$

where $\hat{\epsilon}_{t-1}$ represents the ‘disequilibrium term’, $\hat{\epsilon} = y - \hat{\beta}\tilde{x}$. The two equations above also encompass lagged differences of all variables involved in the cointegration relationship. Although the example provided illustrates only two equations, the second equation can be formulated for each distinct driver within my cointegration relationship.

The Granger Representation Theorem states that for a long-term equilibrium relationship to be present between y and x , at least one of the coefficients, λ_{1i} or λ_{2i} , should be different from zero. Specifically, if $\lambda_{1i} \neq 0$, then x has a causal influence on y ($x \rightarrow y$), and if $\lambda_{2i} \neq 0$, the causal direction is reversed ($y \rightarrow x$). If both λ_{1i} and λ_{2i} are non-zero, they jointly determine one another.

I conducted the described regressions within the framework of the CCE NETGINI specification for the 18⁴⁴ countries with at least 40 observations. In each regression, the disequilibrium term denotes the residuals of the static NETGINI CCE specification. Given the limited time series dimension of my data, I opt to only incorporate a single lag.

I employ Fisher’s combined probability test to assess the empirical estimates for λ_i . For each driver, I aggregate the p-values from eighteen different countries using the formula $X_{2k}^2 = -2 \sum_{i=1}^k \ln p_i$, where $k = 18$. This test statistic follows a chi-squared distribution with 36 degrees of freedom (2N). I present the resulting p-value for this test statistic for λ_1 to delve into direct causality and for each specific driver λ_2 to scrutinise reverse causality.

The first p-value presented in Table 4 indicates an undeniable causal link from my explanatory variables to NETGINI. Nevertheless, this finding does not rule out substantial reverse causality. To scrutinise the impact of reverse causality, it is important to analyse the significance of λ_2 for each driver individually. Notably, λ_2 exhibits significance only for log(GDPCAPITA) at the 10% level. However, the p-values for λ_2 associated with KOF and DEPOSITS are close to, but

⁴⁴The US not included.

Table 4: Test for direction of causation

Direction	p-value for λ_i
$\tilde{x} \rightarrow y$	1.47e-09
$y \rightarrow \log(\text{GDPCAPITA})$	0.0526
$y \rightarrow \log(\text{INFLATION})$	0.6888
$y \rightarrow \text{TFP}$	0.6149
$y \rightarrow \text{SCHOOLING}$	0.8339
$y \rightarrow \text{OPEN}$	0.6331
$y \rightarrow \text{KOF}$	0.1473
$y \rightarrow \text{DEPOSITS}$	0.1096
$y \rightarrow \text{UNION}$	0.5813
$y \rightarrow \text{SOCIALSPENDING}$	0.3655
$y \rightarrow \text{REV}$	0.4668
$y \rightarrow \text{DEPEN}$	0.2229

Source: Own calculation

not far from, the 10% threshold.

Considering the negative coefficient of $\log(\text{GDPCAPITA})$ in Table 3 and the outcomes of my causality test, revealing a mutual influence between $\log(\text{GDPCAPITA})$ and NETGINI , my findings appear to support the idea that more inequality hurts economic growth. However, the latter hypothesis should be examined more extensively, such as done by Berg et al. (2018), before drawing definite conclusions.

Although I (narrowly) fall short of rejecting the null hypothesis of no reverse causality for KOF and DEPOSITS , it is noteworthy that the p-values linked with these variables are considerably lower compared to those associated with the other drivers. Consequently, I advise the reader to interpret the long-run coefficients of KOF and DEPOSITS with caution.

Several studies in the (income inequality) literature employ GMM estimators to correct for endogeneity and causality. While GMM is a powerful and flexible tool, it requires careful handling of instruments and does not inherently address cross-sectional dependence, unlike the CCE estimator (Sarafidis & Robertson, 2009; Chudik & Pesaran, 2013). This limitation can potentially lead to biased results if cross-sectional dependence is present.

I attempted to estimate a GMM model as a robustness check. The results closely resembled

those obtained with the CCE estimator. However, I am concerned about the accuracy of these results due to a warning message in RStudio indicating that the second-step matrix is singular. Details are available upon request.

5.7 Counterfactual Analysis

In this subsection, I analyse the extent to which each factor has contributed to the evolution of disposable income inequality in France, Italy, New Zealand, and Japan since 1970. I selected these four countries because all data was available for them, and they offer a diverse representation of OECD countries.

Figure 8 illustrates the estimated impact on the Gini coefficient of disposable income of changes in four potential drivers of inequality since 1970. Each graph in the figure compares the NET-GINI CCE's fitted value for the four selected countries with the following scenarios: (i) the simulated value if TFP remained at its 1970 level, (ii) the simulated value if SCHOOLING remained at its 1970 level, (iii) the simulated value if DEPEND remained at its 1970 level.

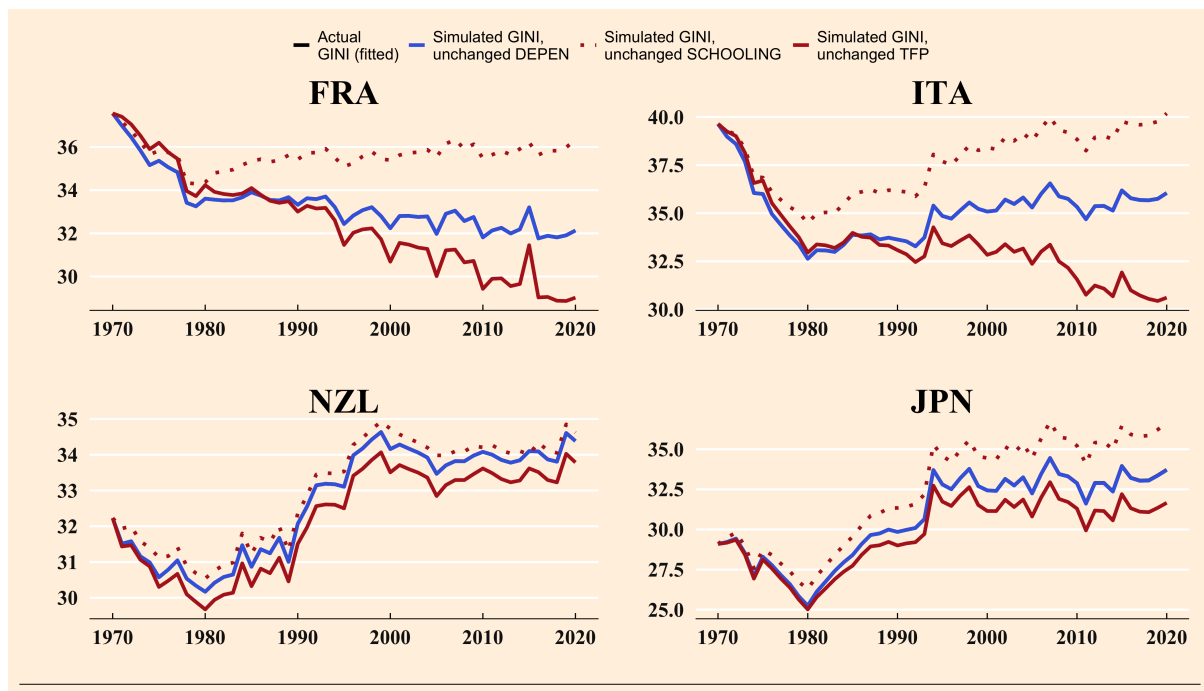


Figure 8: Counterfactual analysis for a select group of countries: fitted and simulated model (DEPEND, SCHOOLING & TFP)

Source: Own calculation

Figure 8 yields several significant insights. Firstly, it is evident that the impact of skill-biased technological change (SBTC) is clearly there, albeit with substantial variations across countries. Notably, New Zealand exhibits a much smaller impact of SBTC compared to the other countries. Additionally, the influence of schooling appears to be notably smaller in New Zealand compared to its effect in other countries, where schooling seems to act as a crucial mitigating factor for income inequality trends. Lastly, the analysis reveals that ageing has had a negligible impact⁴⁵ on the evolution of income inequality since the 1970s.

Figure 9 depicts the hypothetical scenarios if (i) OPEN, (ii) KOF, and (iii) DEPOSITS remained at their 1970 levels.

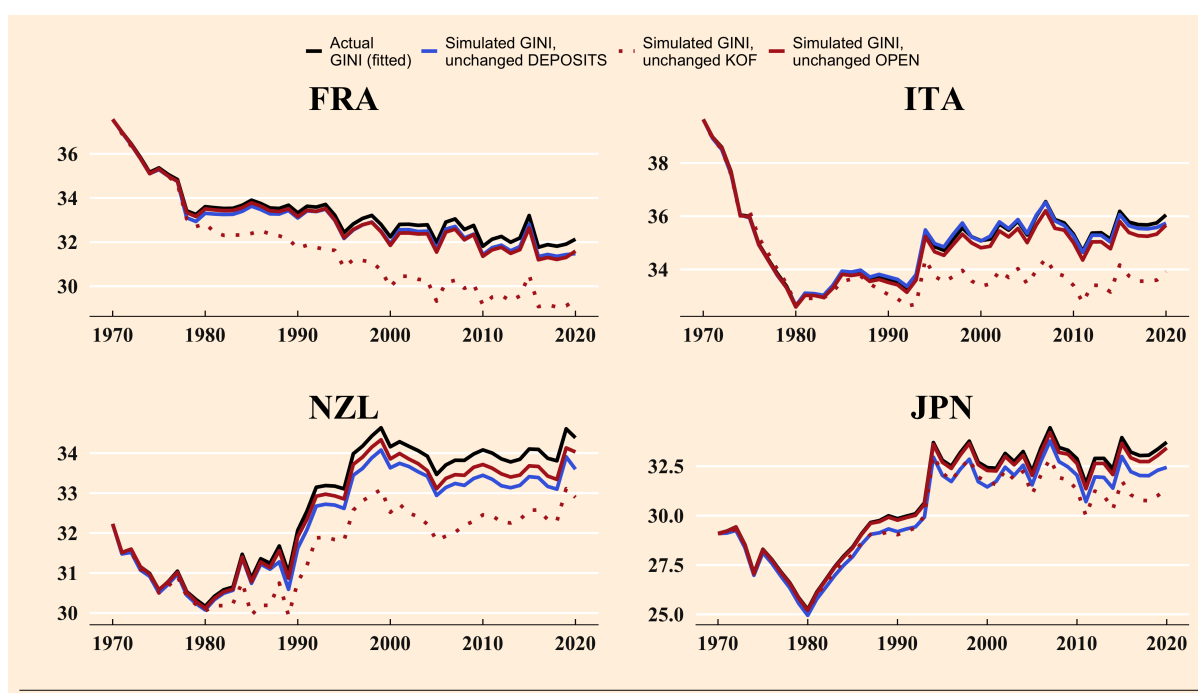


Figure 9: Counterfactual analysis for a select group of countries: fitted and simulated model (DEPOSITS, KOF & OPEN)

Source: Own calculation

Although the influence of trade globalisation (OPEN) seems minimal across all four countries, the effects of financial globalisation (KOF) are not. In the absence of financial globalisation, NETGINI would be at least two percentage points lower in all four countries. In the cases of New Zealand and Japan, Figure 9 shows that financial deepening has also exerted some impact, albeit relatively modest.

⁴⁵The black lines are entirely overshadowed by the blue lines.

Figure 10 illustrates hypothetical scenarios wherein (i) UNION remains at its 1970 level, (ii) social spending remains at its 1970 levels, and (iii) REV remains at its 1970 level.

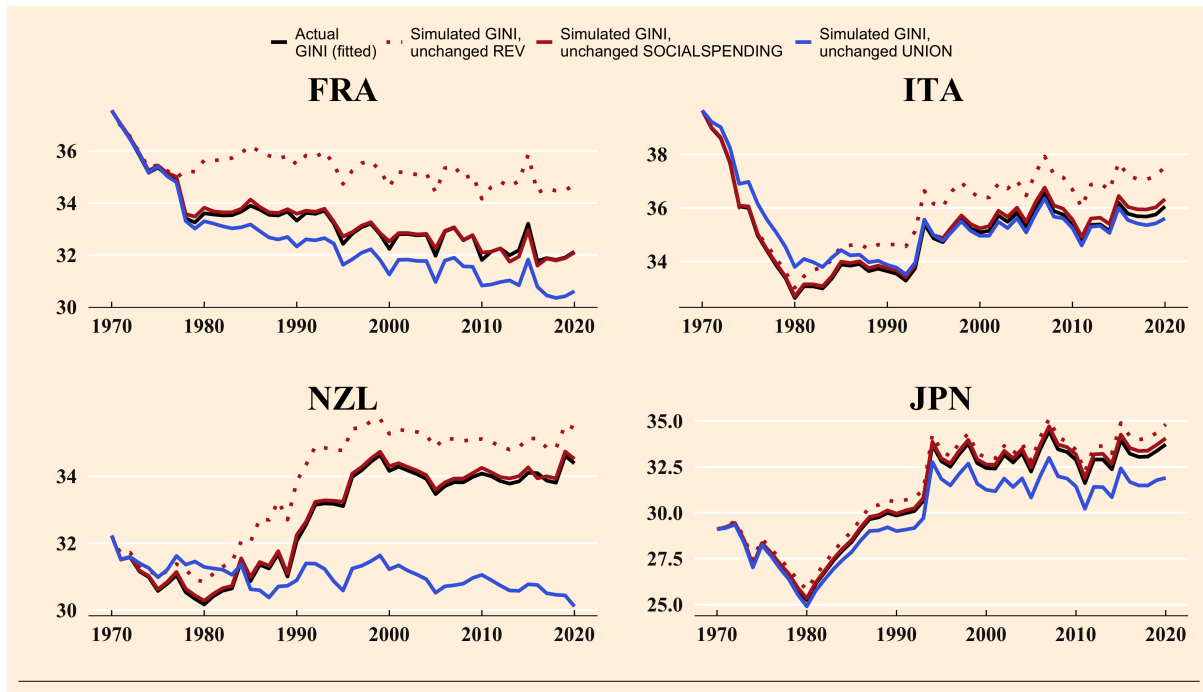


Figure 10: Counterfactual analysis: fitted and simulated model (REV, SOCIALSPENDING & UNION)

Source: Own calculation

If de-unionisation had not occurred, the current Net Gini coefficient in France and Japan would have been reduced by more than one percentage point. In New Zealand⁴⁶, the reduction would have been even more significant, around four percentage points. However, de-unionisation appears to have minor importance in Italy. Public social spending has a minimal impact across all four countries. On the other hand, revenues as a share of GDP played a substantial role in France, Italy, and New Zealand.

Economic indicators from the 1970s have relatively little explanatory power compared to later years. Unobserved common factors appear to be most significant in explaining the decrease in

⁴⁶Unionisation in New Zealand increased during the 1970s, driven by a significant expansion in state employment, which traditionally has higher unionisation rates in New Zealand (Gregory, 2009). However, the economic reforms of the 1980s, known as Rogernomics—named after Finance Minister Roger Douglas—led to a substantial decline in union density (Ahlquist, 2011). This decline steepened further with the introduction of the Employment Contracts Act of 1991. The Act abolished compulsory unionism, which had been mandatory in some sectors, and significantly reduced union representation in the workplace (Kelsey, 2015).

inequality during this decade across all four countries studied. Scholars suggest that the negative effects of the oil crises in the 1970s were broadly shared among different income groups, mitigating their impact on inequality (Levy & Temin, 2007). Additionally, the civil rights movement and the women's liberation movement led to greater political and economic power for minority groups and women (Borstelmann, 2011). The 1970s also witnessed the entry of the baby boom generation into the labour market. As these workers began their careers at similar entry-level wages, the overall income distribution became less skewed (Levy & Temin, 2007).

Table 5 provides an overview of the decomposition, illustrating the contribution of all the various drivers⁴⁷ to the evolution of the fitted NETGINI in the four countries from 1970 to 2020.

Table 5: Contribution (in %) of the different drivers to the evolution of the fitted NETGINI since 1970 for a select group of countries

Variable	FRA	ITA	NZL	JPN
log(GDPCAPITA)	13.02	9.86	20.40	18.34
log(INFLATION)	0.53	0.61	0.87	0.81
TFP	13.63	25.53	4.37	9.81
SCHOOLING	18.41	19.43	1.75	13.82
OPEN	1.84	1.83	2.62	1.39
KOF	12.05	10	10.85	11.15
DEPOSITS	2.85	1.45	5.75	5.96
UNION	6.66	2.11	31.10	8.67
SOCIALSPENDING	0.13	1.31	1.02	1.62
REV	11.31	6.95	7.66	5.19
DEPEN	0.02	0.04	0.03	0.08
Unobserved common factors	19.29	20.88	13.56	23.17

Source: Own calculation

5.8 Inflation: Demand versus Supply shocks

In all CCE specifications, log(INFLATION) exhibited a negative sign. This suggests that inflation might help to mitigate inequality. Yet, the idea that inflation worsens inequality is so widespread and ingrained. It is, however, plausible that the impact of inflation on inequality is contingent on the cause of inflation. For instance, following a positive demand shock, both output and inflation rise. In such a scenario, the reduction in unemployment stemming from the

⁴⁷Caution is advised when interpreting the impact of log(GDPCAPITA), as the previous section indicates the presence of reverse causality for log(GDPCAPITA).

positive demand shock could serve as the channel of the negative correlation between inequality and inflation. The results are very likely to differ in the case of a negative supply shock. After a negative supply shock, inflation goes up while output goes down. This subsection explores whether the impact of inflation on inequality depends on the cause of higher inflation. To analyse this, I scrutinise whether the sign of the relationship between inflation and inequality depends on the type of shock. I aim to test this hypothesis by generating impulse response functions (IRFs) for both types of inflationary shocks. These IRFs will illustrate the trajectory of four distinct types of inequality over a given horizon following either a demand-pull or a supply-push inflationary shock. For econometric identification⁴⁸, I will use Jorda's (2005) local projections methodology with two types of exogenous shocks. This popular estimation method involves regressing the dependent variable at time $t + h$ on the exogenous shock variable at time t .

I opt for a Local Projections (LP) specification over a VAR specification because Local Projections are more robust to misspecification and can be estimated by a single equation. Specifically, I prefer an LP specification in first differences for the Gini coefficient over an LP specification in levels, as the former provides consistent impulse responses⁴⁹. Furthermore, LP's in first differences are consistent even when ECM is the correct model. I accumulate the first differences over time to find the response in levels. On the downside, accumulating the first differences implies that standard inference is not possible any more due to a random walk structure in the error terms. This critical issue has been largely overlooked in the literature on local projections. Despite this, in line with existing research, I provide Newey-West corrected standard errors and p-values for assessing joint significance.

Owing to data availability constraints, this analysis is exclusively conducted for the United States. However, in this section, I use quarterly data instead of yearly data, spanning the period 1980-2008⁵⁰.

⁴⁸Unlike Geiger, Mayer, and Scharler (2020), who employ a Structural Vector Autoregression (SVAR) model with sign restrictions, I identify demand and supply shocks through exogenous shocks. It is reassuring that my findings broadly align with theirs.

⁴⁹Although local projections in first differences are consistent, they are still biased, as all local projection specifications are. However, the bias tends to be smaller when employing first differences rather than levels.

⁵⁰The four distinct Gini coefficients used in this analysis are exclusively available for this specific period.

Given that inflationary shocks always coincide with fluctuations in other macroeconomic variables, I have no choice but to examine the impact of macroeconomic shocks that not only correlate with higher inflation but also exert influence on output, employment, etc. Nonetheless, as emphasized in subsection 4.6, these effects on other variables are important, as the effects of inflation are expected to propagate through various channels. Hence, when I mention the impact of inflation on inequality, I am referring to how certain economic shocks, causing inflation to rise, affect inequality.

I begin by assessing how exogenous shocks influence inflation, ensuring that inflation rises following these shocks. To achieve this, I first conduct a local projection specification with the first difference of inflation as the dependent variable and one of the two exogenous shock variables as the independent variable⁵¹. As additional controls, I include four lags of the first difference of inflation since I am dealing with quarterly data. Rather than relying solely on quarterly observations, I employ a four-quarter backward moving average, represented as $\frac{1}{4} \sum_{j=0}^3 \Delta INFLATION_{t+h-j}$, as the dependent variable. This averaging process helps to reduce some of the quarterly fluctuations in the impulse response estimates but does not substantially impact the analysis otherwise. Since I also incorporate four quarterly lags of $\Delta INFLATION_{t+h-j}$, the estimation process is essentially the same as using $\Delta INFLATION_{t+h-j}$ as the dependent variable and subsequently applying a moving average to the estimated impulse responses.

I employ two distinct exogenous shock variables⁵² (e_t): one representing expansionary monetary policy (RR) and the other capturing negative (oil) supply shocks (OIL). To address the potential enduring effects of past innovations in these shock variables on inflation, I include 20 lags of the respective exogenous shock variable, in line with the approach adopted by Coibion et al. (2017) and Aye et al. (2019). These previous innovations should be considered as control variables. My projection horizon consistently spans 20 quarters. The impulse responses for the first differences are given by $\left\{ \beta_0^{(h)} \right\}_{h=0}^{20}$.

⁵¹Note that directly including the exogenous shocks instead of using instrumental variables for inflation and then investigating the impact of the instrumented inflation shock on inequality yields the same results. The only difference lies in the rescaling of the effects of exogenous shocks on inequality to represent a 1 percentage point inflation shock. However, the multiplier effect of inequality to inflation remains exactly the same in both scenarios.

⁵²It is important to highlight that the “lpirfs” package uses all observations of the exogenous shock variable, assuming a symmetrical response to positive and negative shocks. Additionally, the package adjusts the signs of the control variables to align with the direction of the shock.

$$\begin{aligned}
\frac{1}{4} \sum_{j=0}^3 \Delta INFLATION_{t+h-j} &= \alpha^{(h)} + \sum_{i=0}^{20} \beta_i^{(h)} e_{t-i}^{RR} \\
&+ \sum_{j=1}^4 \rho_j^{(h)} \Delta INFLATION_{t-j} \\
&+ \epsilon_{t+h}
\end{aligned} \tag{19}$$

$$\begin{aligned}
\frac{1}{4} \sum_{j=0}^3 \Delta INFLATION_{t+h-j} &= \alpha^{(h)} + \sum_{i=0}^{20} \beta_i^{(h)} e_{t-i}^{OIL} \\
&+ \sum_{j=1}^4 \rho_j^{(h)} \Delta INFLATION_{t-j} \\
&+ \epsilon_{t+h}
\end{aligned} \tag{20}$$

The procedure outlined in the preceding paragraphs is replicated for four different Gini coefficients. The subsequent paragraph gives the reasoning behind examining these four different types of (economic) inequality.

$$\begin{aligned}
\frac{1}{4} \sum_{j=0}^3 \Delta GINI_{t+h-j} &= \alpha^{(h)} + \sum_{i=0}^{20} \beta_i^{(h)} e_{t-i}^{RR} \\
&+ \sum_{j=1}^4 \rho_j^{(h)} \Delta GINI_{t-j} \\
&+ \epsilon_{t+h}
\end{aligned} \tag{21}$$

$$\begin{aligned}
\frac{1}{4} \sum_{j=0}^3 \Delta GINI_{t+h-j} &= \alpha^{(h)} + \sum_{i=0}^{20} \beta_i^{(h)} e_{t-i}^{OIL} \\
&+ \sum_{j=1}^4 \rho_j^{(h)} \Delta GINI_{t-j} \\
&+ \epsilon_{t+h}
\end{aligned} \tag{22}$$

It is important to acknowledge that not all households experience the same inflation rate (Kaplan & Schulhofer-Wohl, 2017). There is a consensus in the literature that poorer households consume relatively more price-volatile goods and services than more affluent households. Consequently, the purchasing power of the same dollar varies depending on one's position within the income distribution (Coibion et al., 2017). The traditional Gini coefficient does not take this into account. Coibion et al. (2017) used data from the Consumer Expenditure Survey (CEX) to derive household-specific inflation rates. They then integrated these heterogeneous inflation rates with the household income distribution to calculate a consumption inequality Gini coefficient. Furthermore, they also computed a broader expenditure inequality Gini coefficient, which also encompasses expenses like mortgage payments, vehicle purchases, medical supplies and services, and educational costs such as tuition and books, among other categories of goods.

To investigate whether the impact of inflation on inequality stems from variations in labour earnings or from the composition⁵³ of household income, Coibion et al. (2017) additionally develop a Gini coefficient for labour earnings and a Gini coefficient for overall income inequality. All Gini coefficients⁵⁴ formulated by Coibion et al. (2017) are computed quarterly. Table 6 displays the averages of the four Gini coefficients over the period 1980-2008.

Table 6: Descriptive statistics for the Gini coefficient for four different types of inequality (1980-2008)

Type inequality	Average	Standard deviation
Total income	44.25	1.36
Labour earnings	57.99	1.22
Consumption	34.21	0.78
Expenditure	37.35	1.13

Table 7 provides details regarding the source and time frame of the various Gini coefficients and exogenous shock variables. The inflation rate used for the inflation shocks corresponds to the

⁵³Apart from labour earnings, the household's income also consists of financial income, business income and transfers to the household.

⁵⁴It is important to emphasize that "inequality" in this subsection refers to the four different Gini coefficients of Coibion et al. (2017).

seasonally adjusted implicit price quarterly inflation rate⁵⁵. Appendix 1.10 contains graphical representations of the two exogenous shock variables.

Table 7: Data description for the Local Projections specifications

Indicator	Description	Data Source	Period
Gini coefficient for total (after-tax) income inequality	Gini coefficient for total (after-tax) income inequality based on CEX data	Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Monetary policy and inequality. <i>Journal of Monetary Economics</i> , 88, 70-89.	1980-2008
Gini coefficient for labour earnings inequality	Gini coefficient for labour earnings (salary) inequality based on CEX data	Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent Bystanders? Monetary policy and inequality. <i>Journal of Monetary Economics</i> , 88, 70-89.	1980-2008
Gini coefficient for consumption inequality	Gini coefficient for consumption inequality based on CEX data	Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent Bystanders? Monetary policy and inequality. <i>Journal of Monetary Economics</i> , 88, 70-89.	1980-2008
Gini coefficient for total expenditures inequality	Gini coefficient for (total) expenditures inequality based on CEX data	Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent Bystanders? Monetary policy and inequality. <i>Journal of Monetary Economics</i> , 88, 70-89.	1980-2008
RR	Exogenous US monetary policy shocks identified with the narrative approach	Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). <i>Innocent Bystanders? Monetary policy and inequality</i> . <i>Journal of Monetary Economics</i> , 88, 70-89.	1969-2008
OIL	High-frequency data OPEC Oil supply news series	Känzig, D. R. (2021). The macroeconomic effects of oil supply news: Evidence from OPEC announcements. <i>American Economic Review</i> , 111(4), 1092-1125.	1974-2017

In my base analysis, I opt not to include (additional) control variables. However, some re-

⁵⁵The quarterly inflation rate is calculated by taking the first difference of the natural logarithm of the current quarter's (seasonally adjusted) GDP deflator ($DEFLATOR_t$) with that of the previous quarter ($DEFLATOR_{t-1}$), and multiplying this first difference with 100. So $INFLATION_t = 100\Delta DEFLATOR_t = 100(DEFLATOR_t - DEFLATOR_{t-1})$, with $DEFLATOR_t = \ln(GDPdeflator_t)$

searchers argue that including relevant control variables could potentially minimise variance around the point estimates and enhance the precision of impulse responses. In Appendix 1.9, I re-estimate the figures from this analysis, this time including control variables. Interestingly, the outcomes closely mirror those from my initial analysis without control variables. I observe no significant enhancement upon the inclusion of control variables.

To ensure the validity of the structural shocks in my analysis of inflation's impact on inequality, two lead-lag exogeneity conditions should be met:

- $E[e_t \epsilon_{t+h}^{\Delta INFLATION}] = 0$ for all h
- $E[e_t \epsilon_{t+h}^{\Delta GINI}] = 0$ for all h

The lead-lag exogeneity condition, in the context of time series analysis, stipulates that explanatory variables are uncorrelated with past, current and future error terms. This means that for example in the context of exogenous monetary policy, interest rate changes should not be systematically influenced by anticipated future changes in inflation or inequality, nor should they be responses to current or past changes in inflation or inequality.

Effects of Demand-pull Inflation (Expansionary Monetary Policy)

While the federal funds rate serves as the primary monetary policy indicator in the US, using it as the exogenous shock variable is not advisable. This is because changes in the federal funds rate are highly endogenous to the business cycle and are most often anticipated (Romer & Romer, 2004). Typically, the Federal Reserve cuts interest rates when economic downturns are anticipated. Consequently, in such scenarios, inflation is unlikely to increase following an interest rate cut, even if the monetary policy has a stimulative effect on the economy. If anticipatory countercyclical actions are widespread, a regression analysis may fail to detect a negative relationship between interest rate hikes and inflation, even if such a relationship exists in reality (Romer & Romer, 2004). Therefore, it is crucial to ensure that my variable for monetary policy shocks is independent of anticipatory effects associated with economic conditions.

Romer & Romer (2004) developed such a series, which was subsequently updated by Coibion et al. (2017). Their approach, based on a “narrative” methodology, draws on historical Federal Reserve records to identify monetary policy shocks. Their measure isolates policy changes

from each meeting that are orthogonal⁵⁶ to the Fed's internal forecasts for inflation, real output growth, and unemployment.⁵⁷

Additionally, I need to assume that the exogenous monetary policy innovations in the series of Romer & Romer (2004) are not driven by concerns over inequality. This assumption is justifiable for several reasons: first, reducing inequality does not fall within the Fed's dual mandate; second, addressing inequality may conflict with the Fed's dual mandate; and third, decisions driven by concerns over inequality would face enormous criticism.

Figure 11 depicts the inflation response to a 100 basis point decrease in the federal funds rate, as identified by the series developed by Romer & Romer (2004) and updated by Coibion et al. (2017). Notably, inflation experiences a substantial surge following such an expansionary monetary policy shock, indicating a strong correlation between the surprise series and the targeted shocks. The impulse responses shown in Figure 11 imply that, following an unexpected 100 basis point reduction in the federal funds rate, the GDP deflator is approximately 5.06% higher after 20 quarters than it would have been without the rate cut.

Figure 12 displays the impulse response functions of the four distinct Gini coefficients following an exogenous 100 basis points reduction in the federal funds rate. Following such a shock, all four Gini coefficients seem to decrease at longer horizons. The effects seem to be most pronounced for consumption inequality⁵⁸ and expenditure inequality.

⁵⁶Typically, orthogonal changes in y w.r.t. changes in x are often attributed to the residual terms in the regression model: $\Delta y_t = \beta_0 + \beta_1 \Delta x_t + \epsilon_t$. However, Romer & Romer (2004) extend this approach by incorporating (internal) forecasts for inflation, unemployment, and output for the previous quarter, the current quarter, and the first two future quarters into Δx_t . Their model employs the change in the target federal funds rate as the dependent variable.

⁵⁷An example of such policy changes occurred during the policy easing of late 1984 and early 1985 when the FOMC consistently cited (years after the policy changes) the strength of the dollar as a driving factor behind their decisions in 1984 and 1985 (Romer & Romer, 2004).

⁵⁸The effects on consumption and expenditure inequality may initially appear exceptionally strong, but they are not entirely unexpected. In the US, consumer credit is widespread, particularly in the years leading up to the financial crisis (Durkin et al., 2014). When the Fed sets lower interest rates, credit becomes more accessible to households and at lower costs.

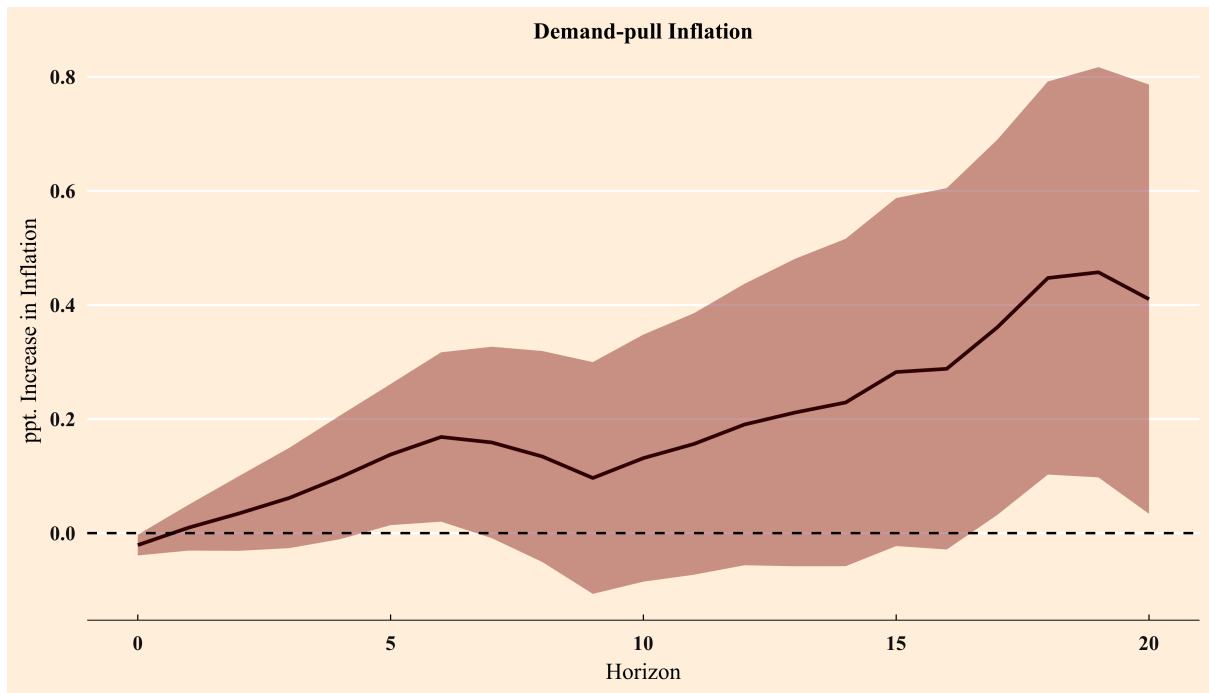


Figure 11: Response of inflation to 100 basis point expansionary monetary policy shock

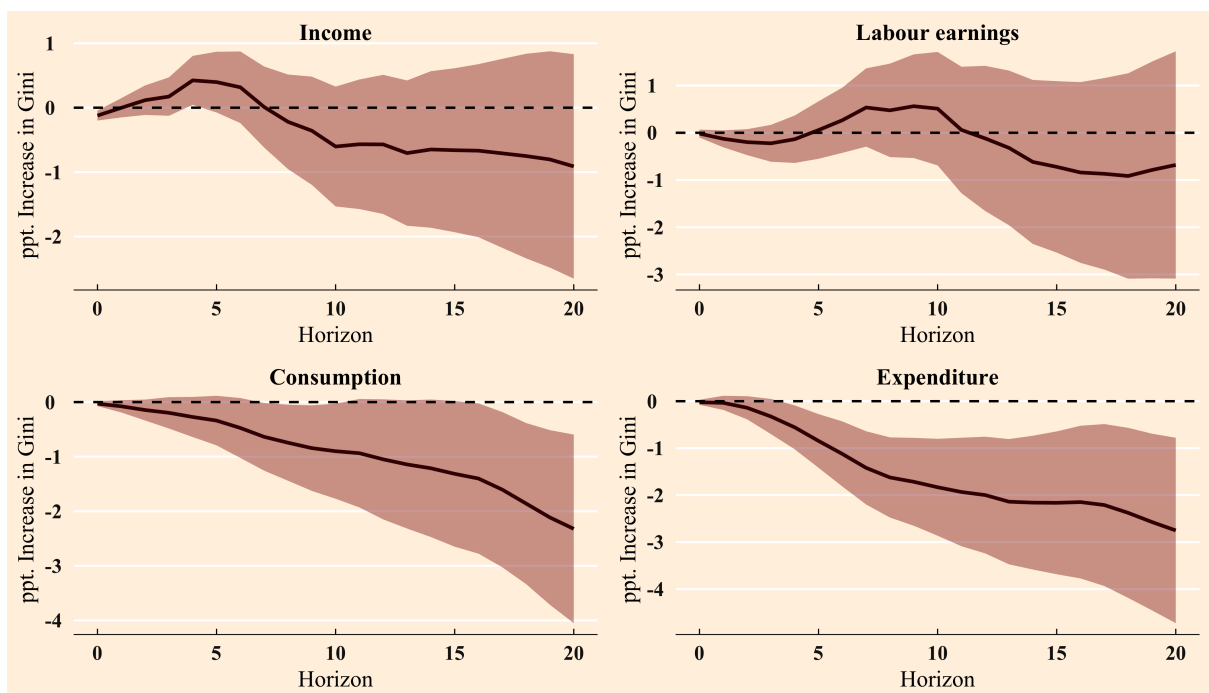


Figure 12: Response of inequality to 100 basis point expansionary monetary policy shock

While many researchers typically rely on error bands for inference on impulse responses, Jorda (2023) argues that although these bands may never lie above/below the zero line individually, the impulse responses as a whole per inequality indicator could be jointly different from zero.

Table 8 provides the p-values of a joint significance test⁵⁹ aimed at evaluating the overall significance of the response to expansionary monetary policy shocks. It reveals that both consumption inequality and expenditure inequality exhibit jointly significant negative responses at the 5% significance level. However, the null hypothesis of no negative responses cannot be rejected for total income inequality and labour earnings inequality at the 5% level, though it can at the 10% level.

Table 8: P-values of a joint significance test to assess the overall significance of the response to an expansionary monetary policy shock

Variable	p-value
Inflation	2.4293e-9
Gini coefficient for total income inequality	0.0681
Gini coefficient for labour earnings inequality	0.0995
Gini coefficient for consumption inequality	4.6575e-8
Gini coefficient for expenditure inequality	1.1244e-23

In order to assess the magnitude of the effects of demand-pull inflation on inequality and to facilitate comparisons with the impulse responses of supply-push inflation in the next paragraphs, I also compute cumulative (inflation) inequality multipliers⁶⁰ over an h-period horizon. The findings are presented in Table 9. The responses of consumption and expenditure inequality appear to be the more pronounced than those of total income (and labour earnings) inequality.

Table 9: Cumulative (inflation) inequality multiplier over an h-period horizon for expansionary monetary policy shocks relative to the average Gini coefficient considered (%)

Horizon	Total Income	Labour earnings	Consumption	Expenditure
4	1.5347	0.2679	-1.4399	-0.7968
8	-0.1144	0.9376	-2.2534	-2.3087
12	-0.3880	0.1445	-1.8150	-2.0621
16	-0.3342	-0.2569	-1.4671	-1.7186
20	-0.4182	-0.1619	-1.4841	-1.4380

⁵⁹Again, I employ Fisher's combined probability test as the joint significance test. However, I correct for the change in signs of altering impulse responses, ensuring that the significance of positive impulse responses is countered by the significance of negative impulse responses.

⁶⁰The cumulative multipliers are computed as $\frac{\sum_{t=0}^h \Delta GINI_t}{100 \sum_{t=0}^h \Delta DEFLATOR_t}$. I calculate the cumulative multipliers for a four (h=4), an eight (h=8), a twelve (h=12), a sixteen (h=16) and a twenty-quarters horizon (h=20).

Effects of Supply-push Inflation (Negative Oil Supply Shocks)

Similar reasoning as with the federal funds rate and exogenous monetary policy innovations applies to why the oil price cannot be employed as an exogenous shock variable. Oil prices tend to be positively correlated with the business cycle. When output increases, so does the oil price. In the event of a negative (oil) supply shock, however, output decreases while the oil price and inflation rise. Moreover, using raw OPEC announcements is also unsuitable. OPEC typically reduces oil production when output is high and increases production when output is low.

Instead of using raw OPEC announcements, I use an OPEC oil supply surprise series spanning 1974-2017 created by Känzig (2021) based on high-frequency data⁶¹. Oil supply surprises are identified through changes in oil futures⁶² prices immediately following OPEC announcements. If oil futures prices change after an OPEC announcement, then this means that there is a difference between the disclosed information and the market's expectations. Assuming that financial markets are efficient and incorporate all available economic information correctly, the OPEC announcement can be regarded as an exogenous shock to the world economy unrelated to contemporaneous economic variables⁶³. Additionally, OPEC decisions are inherently very unlikely to be influenced by developments in US income inequality.

Figure 13 depicts how inflation responds to a 30% shock⁶⁴ in the real oil price (WTI spot price, deflated by US CPI). Similar to the case of expansionary monetary policy, inflation rises following such a negative (oil) supply shock. Note that while inflation gradually rises following an expansionary monetary policy shock, negative oil supply shocks, in contrast, cause an immediate spike in inflation, which subsequently decreases over time⁶⁵. Following an (unexpected) 30% shock in the real oil price, the GDP deflator is approximately 5.96% higher after 20 quar-

⁶¹The original series uses monthly data. I aggregated the monthly data to quarterly data.

⁶²The 1-month to 12-month WTI crude contracts. Keep in mind that a 10% increase in the price of 1-month to 12-month WTI crude contracts is not equivalent to a 10% rise in the WTI crude spot price.

⁶³This also implies that the outcomes of the OPEC announcement were not anticipated by economic agents (another criterion that exogenous shocks should meet).

⁶⁴I used Känzig's (2021) original monthly dataset to estimate the impact of oil supply news shocks on oil prices, employing the same VAR-IV model as Känzig to compute a 10% shock in oil prices. Subsequently, I determined the necessary multiplication factor for the original surprise series to produce a contemporaneous 30% shock in oil prices. Using this multiplication factor, I computed IRFs from the local projections models from shock that correspond to a contemporaneous 30% increase in oil prices. I opted for a 30% shock, unlike Känzig's 10% shock, to facilitate more direct comparisons with the figures of the expansionary monetary policy shocks.

⁶⁵Additionally, it should be noted that my analysis allows the real oil price to decrease over time. If the real oil price were to remain 30% higher, the results would likely differ.

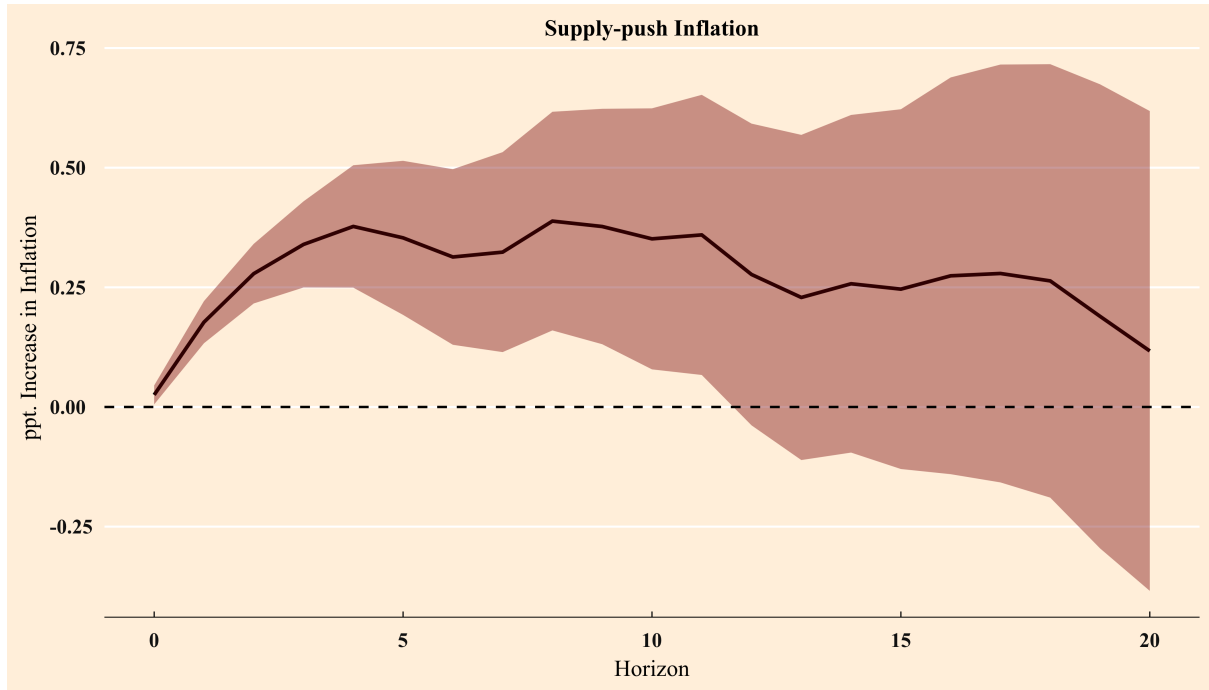


Figure 13: Response of inflation to a 30% shock in the real oil price

ters than it would have been without the oil shock.

The impacts of inflation on inequality appear to be markedly different when considering a negative (oil) supply shock (Figure 14). Here, inequality in total income, consumption, and expenditures appears to increase. Inequality in labour earnings, on the other hand, does exhibit a slightly negative trend.

The reduction in labour earnings inequality following a negative oil shock warrants further explanation. The labour earnings inequality indicator by Coibion et al. (2017) specifically measures the inequality among those who are employed, excluding unemployment benefits. This exclusion is significant because oil shocks often lead to layoffs, particularly affecting unskilled workers in the manufacturing sector. Once these workers are unemployed, their wages are no longer reflected in the labour earnings inequality indicator, potentially skewing the data towards lower inequality. Additionally, the resource sector, which employs a substantial number of unskilled workers, might see wage increases during an oil shock (Michieka & Gearhart, 2022). This increase in wages within the resource sector can contribute to a narrowing of the wage gap. Michieka & Gearhart (2022) also highlight that nominal wage increases following a negative oil shock are the smallest in the services sector, which could further influence the overall labour

earnings distribution by reducing the disparity between the highest and lowest wages.

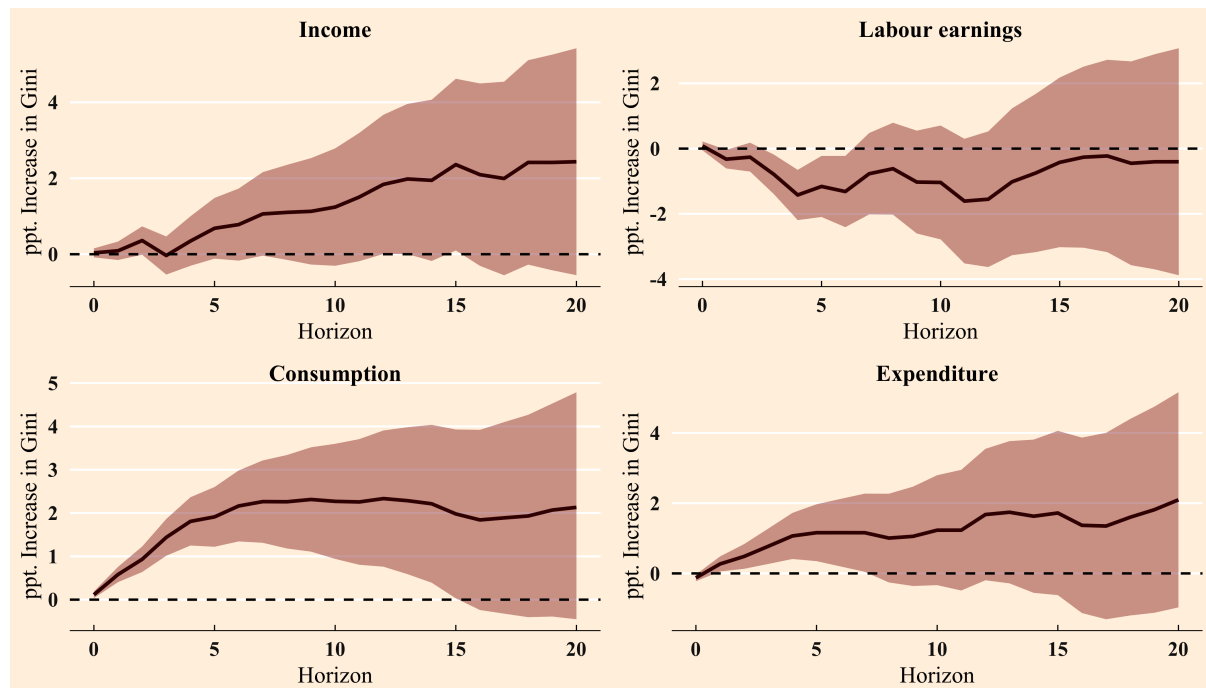


Figure 14: Response of inequality to a 30% shock in the real oil price

The impulse responses for total income inequality, consumption inequality, and expenditure inequality are all jointly positively significant at the 5% level (Table 10). The impulse responses for labour earnings inequality, in contrast, are jointly negatively significant at the 10% level.

Table 10: P-values of a joint test to assess the overall significance of the response to a negative (oil) supply shock

Variable	p-value
Inflation	8.7077-07
Gini coefficient for total income inequality	1.6342e-4
Gini coefficient for labour earnings inequality	0.0918
Gini coefficient for consumption inequality	8.8129e-5
Gini coefficient for expenditure inequality	0.0018

Table 11 displays the outcomes of the cumulative (inflation) inequality multipliers for an h-period horizon for supply-push inflation. Over longer horizons, the cumulative multipliers for total income, consumption, and expenditure inequality are of similar magnitudes. The cumulative multipliers for labour earnings inequality are relatively smaller in absolute values at longer

horizons.

Table 11: Cumulative (inflation) inequality multiplier over an h-period horizon for negative (oil) supply shocks relative to the average Gini coefficient considered (%)

Horizon	Total Income	Labour earnings	Consumption	Expenditure
4	0.4389	-1.5185	4.6457	2.8035
8	0.8960	-0.7077	2.8844	1.3467
12	0.9620	-0.7012	1.8495	1.4985
16	0.9076	-0.1024	1.0766	1.0372
20	0.8924	-0.1442	1.1210	1.0924

As it seems that mainly negative (oil) supply shocks increase inequality, it is interesting to know whether the effects depend on the monetary policy response. To analyse this, I estimate two supplementary local projections specifications⁶⁶. To compute them, I incorporate three interaction terms between policy indicators signifying a contractionary monetary policy response in the subsequent quarters and the negative (oil) supply shock. In addition, I also consider interaction terms in the case of an expansionary monetary policy response. I use the changes in the federal funds rate (ΔFF_t), when positive⁶⁷, in the next three quarters to signal a contractionary response. Conversely, I use the changes in the federal funds rate, when negative⁶⁸, in the next three quarters to signal an expansionary response. To account for the possibility that changes in the Federal Funds rate may be influenced by factors such as aggregate demand, I include the change in real GDP growth and the unemployment rate as control variables.

⁶⁶For these two local projections estimations, I exclude positive oil supply shocks for e_t^{OIL} . The lagged e_{t-i}^{OIL} do, however, include positive oil supply shocks.

⁶⁷When the federal funds rate is lowered, I set ΔFF_t to zero.

⁶⁸When the federal funds rate is increased, I set ΔFF_t to zero.

$$\begin{aligned}
\frac{1}{4} \sum_{j=0}^3 \Delta GINI_{t+h-j} &= \alpha^{(h)} + \sum_{i=0}^{20} \beta_i^{(h)} e_{t-i}^{OIL} \\
&+ \sum_{j=1}^4 \rho_j^{(h)} \Delta GINI_{t-j} \\
&+ \gamma^{(h-1)} \Delta FF_{t+1} e_t^{OIL} \\
&+ \zeta^{(h-2)} \Delta FF_{t+2} e_t^{OIL} \\
&+ \eta^{(h-3)} \Delta FF_{t+3} e_t^{OIL} \\
&+ \mu^{(h)} \Delta ECOGROWTH_t \\
&+ \nu^{(h)} \Delta UNEMPLOYMENT_t \\
&+ \epsilon_{t+h}
\end{aligned} \tag{23}$$

As an illustration, the first five impulse responses are given by:

$$\begin{aligned}
&\beta_0^0 \\
&\beta_0^1 + \gamma^0 \Delta FF_{t+1} \\
&\beta_0^2 + \gamma^1 \Delta FF_{t+1} + \zeta^0 \Delta FF_{t+2} \\
&\beta_0^3 + \gamma^2 \Delta FF_{t+1} + \zeta^1 \Delta FF_{t+2} + \eta^0 \Delta FF_{t+3} \\
&\beta_0^4 + \gamma^3 \Delta FF_{t+1} + \zeta^2 \Delta FF_{t+2} + \eta^1 \Delta FF_{t+3} \\
&\beta_0^5 + \gamma^4 \Delta FF_{t+1} + \zeta^3 \Delta FF_{t+2} + \eta^2 \Delta FF_{t+3}
\end{aligned} \tag{24}$$

Table 12 illustrates the average difference⁶⁹ in the impulse response functions for each Gini coefficient between a contractionary and an expansionary monetary policy reaction⁷⁰. For three of the four Gini coefficients, inequality appears to be more pronounced following a contractionary response compared to an expansionary one. From the perspective of inequality, an expansionary response emerges as the preferable policy action concerning these four Gini coefficients.

⁶⁹From the fourth quarter to the twentieth quarter.

⁷⁰For context, the average difference in the impulse responses for inflation between a contractionary monetary response and an expansionary monetary policy response is -0.2642. After twenty quarters, a negative oil supply shock followed by contractionary policy results in a 4.20% increase in the GDP deflator. In contrast, if expansionary policy had been adopted, the GDP deflator would have risen by 9.09%.

Table 12: Average difference in the impulse response functions following a contractionary versus an expansionary monetary policy response

Gini coefficient	Average of $(IRF_{hikes} - IRF_{cuts})$
Total income inequality	1.3770
Labour earnings inequality	-1.1220
Consumption inequality	1.0861
Expenditure inequality	1.6000

For readers interested in the differences for specific horizons, Appendix 1.11 displays these differences individually.

Summary

Overall my findings align with the view that the effects of inflation on inequality are contingent on what drives this inflation. Without differentiating between demand and supply shocks, the effects of inflation were significantly negative in the CCE estimators. However, upon isolating the effects of supply-push inflation, inflation seems to heighten inequality⁷¹. The absence of a positive relationship between inflation and inequality without making a distinction between demand and supply shocks is likely to be attributed to the mitigating effects of positive demand shocks, which cancel out the adverse effects of negative supply shocks. In line with this reasoning, I find that expansionary monetary policy shocks alleviate inequality.

An expansionary monetary policy in response to negative oil supply shocks can partially mitigate the regressive impact on inequality of negative oil supply shocks. Conversely, a contractionary monetary policy exacerbates the effects of these negative oil supply shocks on inequality. However, inflation is substantially higher under expansionary policy, indicating a clear policy trade-off.

It is crucial to acknowledge that there is still a substantial amount of uncertainty surrounding all findings as inference is incorrect due to a random walk in the error terms.

⁷¹At least in the United States.

6 Conclusion

Given the profound implications of income inequality on various aspects such as economic growth, financial stability, macroeconomic stabilisation policy, human capital development, and productivity, the recent surge in income inequality is a cause for concern. Numerous studies aim to elucidate the underlying factors driving this upward trajectory. Frequently cited propositions in the literature include skill-biased technological advancements, globalisation (trade and financial), financial deepening, the erosion of workers' bargaining power, heightened product market concentration, changes in the objectives of fiscal and monetary policy, the phenomenon of "Superstars", and demographic ageing.

My Contribution

The objective of this study was to empirically identify the key drivers influencing income inequality dynamics in OECD countries within one dataset. While a tsunami of empirical studies concentrates on individual determinants such as globalisation or technological advancements, there remains a scarcity of research that simultaneously examines multiple drivers within a single dataset⁷².

In contrast to many papers in the literature that either focus solely on the rise in inequality since the 1980s or examine only a limited number of countries, this study stands out by using data dating back to the 1970s across numerous countries, and including newer OECD members. Moreover, while many existing studies overlook the time-series properties of various variables and fail to test for cointegration, my analysis places significant emphasis on these properties, recognising that non-stationary error terms can significantly distort the reliability of regression results.

Furthermore, in the context of studying the drivers of income inequality, this analysis pioneers by employing a common correlated effects approach, a method traditionally neglected in the income inequality literature⁷³ despite the potential relevance of common correlated factors with heterogeneous impacts, as demonstrated in my study.

⁷²Noteworthy exceptions include the works of Jaumotte et al. (2013), Asteriou et al. (2014), Dabla-Norris et al. (2015), Peters & Volwahn (2017), Tridico (2018), and Furceri et al. (2019), Jaumotte & Buitron (2020).

⁷³Only a few studies, such as Sequeira et al. (2017), have adopted the unobserved common factors approach.

This dissertation also examines the effects of inflation on four distinct types of inequality in more detail. To broaden the literature's understanding of the relationship between inflation and inequality, I distinguished between two types of macroeconomic shocks that can fuel inflation by using local projections specifications with exogenous shocks.

Main Results

I find evidence for most of the drivers discussed in Section 4. However, significant differences exist in the contribution of each driver to the trajectory of income inequality since the 1970s. Moreover, there is considerable variation among countries regarding the impact of the same driver. Overall, TFP, SCHOOLING, KOF, UNION, and REV emerge as the most influential drivers, albeit with substantial cross-country variations in their effects.

A careful treatment of the time series properties of the different variables is, however, crucial in obtaining reliable and robust results. Traditional fixed-effects specifications are not robust when considering different dependent variables.

My findings exhibit remarkable robustness when examining various dependent variables and alternative specifications. Introducing heterogeneous coefficients for the explanatory variables changes nothing in terms of signs, with the sole exception of DEPEND. For all variables, excluding $\log(\text{GDPCAPITA})$, in the base CCE NETGINI specification, causality mainly runs from the explanatory variable toward NETGINI and not vice versa. Furthermore, all coefficients, where economic theory was not ambiguous, demonstrate the anticipated signs in the NETGINI specification. As demonstrated in Subsection 5.5, the model effectively captures cross-country variations in both income inequality levels and changes. Moreover, the results outlined in Subsection 5.6 illustrate that the magnitude of the coefficients in the NETGINI specification aligns with realistic expectations, as proven by hypothetical scenarios for France, Italy, New Zealand, and Japan that are quite plausible.

While the negative sign of the coefficient for $\log(\text{INFLATION})$ might be surprising for some, my local projections specifications in Subsection 5.8 illustrate that the impact of inflation varies depending on the nature of the macroeconomic shock driving the observed higher inflation.

Demand-pull inflation appears to alleviate inequality in total income, labour earnings, consumption, and expenditures. Supply-push inflation, on the other hand, exacerbates inequality in total earnings, consumption, and expenditures. While a contractionary monetary policy response effectively reduces inflation, it amplifies the increase in inequality.

Relevance of My Results

Most of the factors believed by popular media (and academic literature) to drive macroeconomic income inequality have undeniably played a significant role in the rise of income inequality within the OECD. Thus, it is important to acknowledge that the rhetoric by some populists contains some elements of truth. When formulating policy, it is important to consider the impact of these drivers on income inequality. Dismissing their influence would be misguided and could potentially exacerbate resistance to globalisation, financial deepening, automation, labour market deregulation, and other structural changes.

Rather than denying their role, policymakers should recognise the multifaceted nature of these factors and devise strategies to address their regressive effects while advocating for these changes on grounds other than equity. By simultaneously promoting other benefits of these transformations and implementing policies to counteract their negative impacts, policymakers can strive for a more equitable and sustainable economic landscape. The compensation hypothesis, for example, argues that resistance towards globalisation is much lower in strong welfare states (Cuyvers et al., 2011; Leibrecht et al., 2011; Walter, 2010).

The panel data analysis indicates that increasing the stock of human capital, along with imposing a higher tax burden, can effectively reduce income inequality. The Galor & Zeira model (1993) provides a clear strategy for achieving a Pareto improvement: subsidize education to decrease the individual costs of investing in human capital and fund this subsidy by taxing skilled workers.

Increasing the bargaining power of workers can also contribute to a more equitable income distribution. However, this argument is often challenged by concerns over potential efficiency

costs⁷⁴ (Jaumotte & Osorio-Buitron, 2015).

Following the recent surge in inflation, hawks often use equity arguments to advocate for a contractionary monetary policy response. Their commonly held belief that inflation universally exacerbates inequality is more complex than often assumed. My research reveals that while supply-push inflation tends to increase inequality, demand-pull inflation shows the opposite effect. Even in instances of supply-push inflation, advocating for a contractionary monetary policy response based on equity considerations may be misguided, as my findings suggest that this can actually worsen the situation in terms of inequality (but is effective in lowering inflation).

Avenues for Future Research

While my empirical analysis has provided valuable insights into the macroeconomic drivers of income inequality, this study also suffers from severe limitations and several areas need further exploration.

Follow-up research could potentially disaggregate the various drivers to discern the precise mechanisms at play. For instance, in all countries included in this analysis, Revenues as a share of GDP has increased over time, however, the (evolution of the) progressivity of the tax system may be very different across countries. As demonstrated in Subsection 5.8 for inflation, exploring the effects of a driver through different causes and indicators can yield markedly different results.

My analysis primarily focussed on income inequality, overlooking other forms such as wealth inequality. The impact of the various drivers on wealth inequality might diverge significantly, as is certainly conceivable in the case of inflation (subsection 4.7). Additionally, the drivers examined in my study may not adequately account for the rise in the Top 1% income share, despite the Top 1% experiencing the steepest incline. Subsequent studies could explore the influence of “Superstars” and returns for managerial skills to provide a more comprehensive

⁷⁴Empirical research tends to confirm that more regulated labour market institutions lead to less employment (Nickell et al., 1999, Nickell et al., 2005; Bassanini & Duval, 2006; Alesina et al., 2005). Although it should be noted that even though regulated labour market institutions do tend to lead to more unemployment, Berger & Heylen (2011) find that the evolution of labour and product market institutions only plays a minor role in explaining the differences in per capita hours worked across countries compared to changes in fiscal policies.

understanding.

Excluding subsection 5.8, my customary approach has always been to employ inequality indicators for disposable income. Nevertheless, as proven in subsection 5.8, the trajectory of consumption and expenditure inequality might substantially diverge from that of disposable income inequality. Consider globalisation, for example: while it might exert downward pressure on nominal wages for low-skilled workers, it could simultaneously drive down import prices, resulting in markedly different effects on real wages. Similar reasoning applies to automation. Moreover, inequality in disposable income fails to capture the accessibility of various public goods available to households.

This analysis was conducted in a static context, however, the impact of certain drivers may be different between the short run and the long run. For instance, Hailemariam, Sakutukwa & Dzumashev (2021) employed a PVAR approach to investigate the long-term determinants of income inequality across 17 OECD countries from 1870 to 2016. Their findings indicate that while technology shocks initially decrease income inequality, they ultimately lead to higher income inequality in the long run. However, their analysis is constrained by the small number of countries examined, the narrow scope of drivers considered, and not accounting for unobserved common factors. Therefore, there is a need for new research that explores the dynamic impact of diverse drivers while addressing these constraints.

In subsection 5.8, I solely focused on analysing the effects of one specific⁷⁵ type of demand shock and one particular type of supply shock. However, future research could expand upon this by investigating additional types of demand shocks, such as government spending shocks, and other types of supply shocks, such as technology shocks. Considering various types of shocks could yield significantly different results. For instance, within the framework of skill-biased technological change, it follows that positive technology shocks since the 1970s have contributed to higher inequality (even though they are positive supply shocks). Therefore, there is a need for further exploration into the impacts of different demand and supply shocks.

⁷⁵ Although Geiger, Mayer, and Scharler (2020) analyse the impact of supply and demand shocks broadly, they do not distinguish between different types of these shocks.

References

- [1] Acemoglu, D. (2011). Thoughts on inequality and the financial crisis [Presentation at the American Economic Association].
- [2] Acemoglu, D., & Restrepo, P. (2018). Artificial intelligence, automation, and work. In D. Acemoglu & P. Restrepo (Eds.), *The economics of artificial intelligence: An agenda* (pp. 197-236). University of Chicago Press.
- [3] Acemoglu, D., & Restrepo, P. (2018). The race between man and machine: Implications of technology for growth, factor shares, and employment. *American Economic Review*, 108(6), 1488-1542.
- [4] Acemoglu, D., & Restrepo, P. (2022). Tasks, automation, and the rise in US wage inequality. *Econometrica*, 90(5), 1973-2016.
- [5] Aghion, P., & Bolton, P. (1992). An incomplete contracts approach to financial contracting. *The Review of Economic Studies*, 59(3), 473-494.
- [6] Aghion, P., Caroli, E., & Garcia-Penalosa, C. (1999). Inequality and economic growth: The perspective of the new growth theories. *Journal of Economic Literature*, 37(4), 1615-1660.
- [7] Aghion, P., Howitt, P., Brant-Collett, M., & García-Peñalosa, C. (1998). *Endogenous growth theory*. MIT Press.
- [8] Agnello, L., & Sousa, R. M. (2014). How does fiscal consolidation impact on income inequality?. *Review of Income and Wealth*, 60(4), 702-726.
- [9] Aguiar, M., & Bils, M. (2015). Has consumption inequality mirrored income inequality?. *American Economic Review*, 105(9), 2725-2756.
- [10] Ahlquist, J. S. (2011). Navigating institutional change: The accord, Rogernomics, and the politics of adjustment in Australia and New Zealand. *Comparative Political Studies*, 44(2), 127-155.
- [11] Ahn, S., & Song, N. K. (2017). Unemployment, recurrent unemployment, and material hardships among older workers since the Great Recession. *Social Work Research*, 41(4), 249-262.

- [12] Ahn, S., Kaplan, G., Moll, B., Winberry, T., & Wolf, C. (2018). When inequality matters for macro and macro matters for inequality. *NBER Macroeconomics Annual*, 32(1), 1-75.
- [13] Aiyar, S., & Ebeke, C. (2020). Inequality of opportunity, inequality of income and economic growth. *World Development*, 136, 105115.
- [14] Albanesi, S. (2007). Inflation and inequality. *Journal of Monetary Economics*, 54(4), 1088-1114.
- [15] Alderson, A. S., & Nielsen, F. (2002). Globalization and the great U-turn: Income inequality trends in 16 OECD countries. *American Journal of Sociology*, 107(5), 1244-1299.
- [16] Alesina, A., Glaeser, E., & Sacerdote, B. (2005). Work and leisure in the United States and Europe: Why so different?. *NBER Macroeconomics Annual*, 20, 1–64.
- [17] Alesina, A., & Rodrik, D. (1994). Distributive politics and economic growth. *The Quarterly Journal of Economics*, 109(2), 465-490.
- [18] Almgren, M., Gallegos, J. E., Kramer, J., & Lima, R. (2022). Monetary policy and liquidity constraints: Evidence from the euro area. *American Economic Journal: Macroeconomics*, 14(4), 309-340.
- [19] Amaral, P. S. (2017). Monetary policy and inequality. *Economic Commentary*, (2017-01).
- [20] Ampudia, M., Georgarakos, D., Slacalek, J., Tristani, O., Vermeulen, P., & Violante, G. (2018). Monetary policy and household inequality.
- [21] Anderson, E., Jalles D'Orey, M. A., Duvendack, M., & Esposito, L. (2017). Does government spending affect income inequality? A meta-regression analysis. *Journal of Economic Surveys*, 31(4), 961-987.
- [22] Asteriou, D., Dimelis, S., & Moudatsou, A. (2014). Globalization and income inequality: A panel data econometric approach for the EU27 countries. *Economic Modelling*, 36, 592–599.
- [23] Attanasio, O. P., & Pistaferri, L. (2016). Consumption inequality. *Journal of Economic Perspectives*, 30(2), 3-28.

- [24] Autor, D. H., Dorn, D., & Hanson, G. H. (2013). The China syndrome: Local labor market effects of import competition in the United States. *American Economic Review*, 103(6), 2121-2168.
- [25] Autor, D. H., Dorn, D., & Hanson, G. H. (2016). The China shock: Learning from labor-market adjustment to large changes in trade. *Annual Review of Economics*, 8, 205-240.
- [26] Autor, D., & Salomons, A. (2018). Is automation labor-displacing? Productivity growth, employment, and the labor share (No. w24871). National Bureau of Economic Research.
- [27] Alexiou, C., Trachanas, E., & Vogiazas, S. (2022). Income inequality and financialization: A not so straightforward relationship. *Journal of Economic Studies*, 49(1), 95–111.
- [28] Aye, G. C., Clance, M. W., & Gupta, R. (2019). The effectiveness of monetary and fiscal policy shocks on US inequality: The role of uncertainty. *Quality & Quantity*, 53, 283-295.
- [29] Baccaro, L., & Howell, C. (2011). A common neoliberal trajectory: The transformation of industrial relations in advanced capitalism. *Politics & Society*, 39(4), 521-563.
- [30] Baldwin, R. (2017). The great convergence: Information technology and the new globalization. Harvard University Press.
- [31] Baldwin, R., & Lopez-Gonzalez, J. (2015). Supply-chain trade: A portrait of global patterns and several testable hypotheses. *The World Economy*, 38(11), 1682-1721.
- [32] Ball, L. M., Furceri, D., Leigh, M. D., & Loungani, M. P. (2013). The distributional effects of fiscal consolidation. International Monetary Fund.
- [33] Banerjee, A. V., & Newman, A. F. (1993). Occupational choice and the process of development. *Journal of Political Economy*, 101(2), 274-298.
- [34] Barro, R. J. (2000). Inequality and Growth in a Panel of Countries. *Journal of Economic Growth*, 5, 5-32.
- [35] Barro, R., & Lee, J.-W. (2013). A New Data Set of Educational Attainment in the World, 1950-2010. *Journal of Development Economics*, 104, 184–198.
- [36] Bartels, L. M. (2009). Economic inequality and political representation. In *The unsustainable American state* (pp. 167-196).

- [37] Bartels, L. M. (2016). *Unequal democracy: The political economy of the new gilded age*. Princeton University Press.
- [38] Bassanini, A., & Duval, R. (2006). Employment Patterns in OECD Countries: Reassessing the Role of Policies and Institutions. *OECD Economics Department Working Papers No. 486*. OECD Publishing.
- [39] Bayer, C., & Hanck, C. (2013). Combining non-cointegration tests. *Journal of Time Series Analysis*, 34(1), 83-95.
- [40] Bebchuk, L., & Fried, J. (2006). *Pay without performance: The unfulfilled promise of executive compensation*. Harvard University Press.
- [41] Beck, T., Demirguc-Kunt, A., & Levine, R. (2004). Finance, inequality, and poverty: Cross-country evidence.
- [42] Beck, U. (2018). *What is globalization?*. John Wiley & Sons.
- [43] Benhabib, J., & Rustichini, A. (1996). Social conflict and growth. *Journal of Economic Growth*, 1, 125-142.
- [44] Berg, A. G., & Ostry, J. D. (2017). Inequality and unsustainable growth: Two sides of the same coin? *IMF Economic Review*, 65, 792-815.
- [45] Berg, A., Ostry, J. D., Tsangarides, C. G., & Yakhshilikov, Y. (2018). Redistribution, inequality, and growth: New evidence. *Journal of Economic Growth*, 23, 259-305.
- [46] Berger, T., & Heylen, F. (2011). Differences in hours worked in the OECD: Institutions or fiscal policies?. *Journal of Money, Credit and Banking*, 43(7), 1333–1369.
- [47] Bergh, A., & Nilsson, T. (2010). Do liberalization and globalization increase income inequality?. *European Journal of Political Economy*, 26(4), 488–505.
- [48] Bergholt, D., Furlanetto, F., & Maffei-Faccioli, N. (2022). The decline of the labor share: New empirical evidence. *American Economic Journal: Macroeconomics*, 14(3), 163-198.
- [49] Bilbiie, F. O. (2018). Monetary policy and heterogeneity: An analytical framework.
- [50] Binder, C. (2019). Inequality and the inflation tax. *Journal of Macroeconomics*, 61, 103-122.

- [51] Blanchard, O. J., & Summers, L. H. (1986). Hysteresis and the European unemployment problem. *NBER Macroeconomics Annual*, 1, 15-78.
- [52] Blanchard, O., & Giavazzi, F. (2003). Macroeconomic effects of regulation and deregulation in goods and labor markets. *The Quarterly Journal of Economics*, 118(3), 879-907.
- [53] Blanchard, O., & Katz, L. F. (1997). What we know and do not know about the natural rate of unemployment. *Journal of Economic Perspectives*, 11(1), 51-72.
- [54] Block, F. (2011). Crisis and renewal: The outlines of a twenty-first century new deal. *Socio-Economic Review*, 9(1), 31-57.
- [55] Bordo, M. D., & Meissner, C. M. (2012). Does inequality lead to a financial crisis?. *Journal of International Money and Finance*, 31(8), 2147-2161.
- [56] Borstelmann, T. (2011). *The 1970s: A new global history from civil rights to economic inequality*. Princeton University Press.
- [57] Bourguignon, F. (1981). Pareto superiority of unequalitarian equilibria in Stiglitz's model of wealth distribution with convex saving function. *Econometrica: Journal of the Econometric Society*, 1469-1475.
- [58] Bourguignon, F. (1990). Growth and inequality in the dual model of development: The role of demand factors. *The Review of Economic Studies*, 57(2), 215-228.
- [59] Breunig, R., & Majeed, O. (2020). Inequality, poverty and economic growth. *International Economics*, 161, 83-99.
- [60] Breusch, T. S., & Pagan, A. R. (1979). A simple test for heteroscedasticity and random coefficient variation. *Econometrica: Journal of the Econometric Society*, 1287-1294.
- [61] Brinca, P., Ferreira, M. H., Franco, F., Holter, H. A., & Malafry, L. (2021). Fiscal consolidation programs and income inequality. *International Economic Review*, 62(1), 405-460.
- [62] Buera, F. J., Kaboski, J. P., Rogerson, R., & Vizcaino, J. I. (2022). Skill-biased structural change. *The Review of Economic Studies*, 89(2), 592-625.
- [63] Bumann, S., & Lensink, R. (2016). Capital account liberalization and income inequality. *Journal of International Money and Finance*, 61, 143-162.

- [64] Canning, D., & Pedroni, P. (2008). Infrastructure, long-run economic growth and causality tests for cointegrated panels. *The Manchester School*, 76(5), 504-527.
- [65] Card, D., & DiNardo, J. E. (2002). Skill-biased technological change and rising wage inequality: Some problems and puzzles. *Journal of Labor Economics*, 20(4), 733-783.
- [66] Carreno, J. (2023). Productivity Hysteresis from the Great Recession.
- [67] Cavdar, S. C., & Aydin, A. D. (2015). An empirical analysis about technological development and innovation indicators. *Procedia-Social and Behavioral Sciences*, 195, 1486-1495.
- [68] Charalampakis, E., Fagandini, B., Henkel, L., & Osbat, C. (2022). The impact of the recent rise in inflation on low-income households. *Economic Bulletin Boxes*, 7.
- [69] Checchi, D., & García-Peñalosa, C. (2008). Labour market institutions and income inequality. *Economic Policy*, 23(56), 602-649.
- [70] Chletsos, M., & Sintos, A. (2023). Financial development and income inequality: A meta-analysis. *Journal of Economic Surveys*, 37(4), 1090–1119.
- [71] Chikhale, N. (2023). The effects of uncertainty shocks: Implications of wealth inequality. *European Economic Review*, 154, 104412.
- [72] Chudik, A., & Pesaran, M. H. (2013). Large panel data models with cross-sectional dependence: a survey. *CAFE Research Paper*, (13.15).
- [73] Čihák, M., Demirgüç-Kunt, A., Feyen, E., & Levine, R. (2012). Benchmarking financial systems around the world. *World Bank Policy Research Working Paper*, (6175).
- [74] Cingano, F. (2014). Trends in income inequality and its impact on economic growth.
- [75] Claessens, S., & Perotti, E. (2007). Finance and inequality: Channels and evidence. *Journal of Comparative Economics*, 35(4), 748-773.
- [76] Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent bystanders? Monetary policy and inequality. *Journal of Monetary Economics*, 88, 70-89.
- [77] Colantone, I., & Stanig, P. (2018). Global competition and Brexit. *American Political Science Review*, 112(2), 201-218.

- [78] Cournède, B., Goujard, A., & Pina, Á. (2013). How to achieve growth-and equity-friendly fiscal consolidation? A proposed methodology for instrument choice with an illustrative application to OECD countries. *OECD Journal: Economic Studies*, 13(1).
- [79] Cuyvers, L., De Lombaerde, P., & Rayp, G. (2011). The labour market consequences of globalisation and regionalisation. *International Journal of Manpower*, 32(3), 252–256.
- [80] Dabla-Norris, M. E., Kochhar, M. K., Suphaphiphat, M. N., Ricka, M. F., & Tsounta, M. E. (2015). Causes and consequences of income inequality: A global perspective. International Monetary Fund.
- [81] Dauth, W., Findeisen, S., & Suedekum, J. (2014). The rise of the East and the Far East: German labor markets and trade integration. *Journal of the European Economic Association*, 12(6), 1643-1675.
- [82] Deaton, A., & Paxson, C. (1994). Intertemporal choice and inequality. *Journal of Political Economy*, 102(3), 437-467.
- [83] Devriendt, W., & Heylen, F. (2020). Macroeconomic and distributional effects of demographic change in an open economy—the case of Belgium. *Journal of Demographic Economics*, 86(1), 87-124.
- [84] Devriendt, W., Heylen, F., & Jacobs, A. (2018). Coping with demographic change: Macroeconomic performance and welfare inequality effects of public pension reform. *Journal of Pension Economics & Finance*, 1-25.
- [85] Debortoli, D., & Galí, J. (2021). Monetary policy with heterogeneous agents: Insights from TANK models. *Department of Economics and Business, Universitat Pompeu Fabra*.
- [86] Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *Review of Economics and Statistics*, 80(4), 549–560.
- [87] Dolls, M., Doorley, K., Paulus, A., Schneider, H., & Sommer, E. (2019). Demographic change and the European income distribution. *The Journal of Economic Inequality*, 17, 337-357.

- [88] Dornbusch, R., Fischer, S., & Samuelson, P. A. (1977). Comparative advantage, trade, and payments in a Ricardian model with a continuum of goods. *The American Economic Review*, 67(5), 823-839.
- [89] Dosi, G., Fagiolo, G., Napoletano, M., & Roventini, A. (2013). Income distribution, credit and fiscal policies in an agent-based Keynesian model. *Journal of Economic Dynamics and Control*, 37(8), 1598-1625.
- [90] Dosi, G., Pereira, M. C., Roventini, A., & Virgillito, M. E. (2018). The effects of labour market reforms upon unemployment and income inequalities: An agent-based model.
- [91] Drosdowski, T., Stöver, B., & Wolter, M. I. (2015). The impact of ageing on income inequality (No. 2015/16). *GWS Discussion Paper*.
- [92] Durbin, J., & Watson, G. S. (1950). Testing for serial correlation in least squares regression: I. *Biometrika*, 37(3/4), 409-428.
- [93] Durkin, T. A., Elliehausen, G., Staten, M. E., & Zywicki, T. J. (2014). *Consumer credit and the American economy*. Oxford University Press.
- [94] Easterly, W., & Fischer, S. (2001). Inflation and the Poor. *Journal of Money, Credit and Banking*, 160-178.
- [95] Eberhardt, M., & Teal, F. (2013). No mangoes in the tundra: Spatial heterogeneity in agricultural productivity analysis. *Oxford Bulletin of Economics and Statistics*, 75(6), 914-939.
- [96] Eeckhout, J. (2022). *The Profit Paradox: How Thriving Firms Threaten the Future of Work*. Princeton University Press.
- [97] Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica: Journal of the Econometric Society*, 251-276.
- [98] Fadda, S., & Tridico, P. (Eds.). (2017). *Inequality and uneven development in the post-crisis World*. Taylor & Francis.
- [99] Feenstra, R. C., & Hanson, G. H. (1996). Globalization, outsourcing, and wage inequality.

- [100] Feenstra, R. C., & Hanson, G. H. (1999). The impact of outsourcing and high-technology capital on wages: Estimates for the United States, 1979–1990. *The Quarterly Journal of Economics*, 114(3), 907-940.
- [101] Feenstra, R. C., Inklaar, R., & Timmer, M. P. (2015). The Next Generation of the Penn World Table. *American Economic Review*, 105(10), 3150–3182. Available for download at www.ggdc.net/pwt.
- [102] Feenstra, R. C., & Hanson, G. H. (2003). Global production sharing and rising inequality: A survey of trade and wages. In *Handbook of International Trade*, 146-185.
- [103] Fisher, I. (1933). The debt-deflation theory of great depressions. *Econometrica: Journal of the Econometric Society*, 337-357.
- [104] Friedman, M. (1977). Nobel lecture: Inflation and unemployment. *Journal of Political Economy*, 85(3), 451-472.
- [105] International Monetary Fund. (2017). *World Economic Outlook, April 2017: Gaining Momentum? In Perspectives de l'économie mondiale*. <https://doi.org/10.5089/9781475597172.081>
- [106] Furceri, D., & Loungani, M. P. (2015). Capital account liberalization and inequality. *International Monetary Fund*.
- [107] Furceri, D., Loungani, P., & Zdzienicka, A. (2018). The effects of monetary policy shocks on inequality. *Journal of International Money and Finance*, 85, 168-186.
- [108] Furceri, D., & Ostry, J. D. (2019). Robust determinants of income inequality. *Oxford Review of Economic Policy*, 35(3), 490–517.
- [109] Galasso, V., & Profeta, P. (2007). How does ageing affect the welfare state?. *European Journal of Political Economy*, 23(2), 554-563.
- [110] Galbraith, J. K. (2012). *Inequality and instability: A study of the world economy just before the great crisis*. Oxford University Press.
- [111] Galí, J., López-Salido, J. D., & Vallés, J. (2007). Understanding the effects of government spending on consumption. *Journal of the European Economic Association*, 5(1), 227–270. <https://doi.org/10.1162/JEEA.2007.5.1.227>

- [112] Galor, O., & Moav, O. (2004). From physical to human capital accumulation: Inequality and the process of development. *The Review of Economic Studies*, 71(4), 1001-1026.
- [113] Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *The Review of Economic Studies*, 60(1), 35-52.
- [114] Galí, J. (2018). The state of New Keynesian economics: A partial assessment. *Journal of Economic Perspectives*, 32(3), 87-112.
- [115] Geiger, M., Mayer, E., & Scharler, J. (2020). Inequality and the business cycle: evidence from US survey data. *Applied Economics*, 52(31), 3418–3435.
- [116] Glei, D. A., Goldman, N., & Weinstein, M. (2019). A growing socioeconomic divide: Effects of the Great Recession on perceived economic distress in the United States. *PloS One*, 14(4), e0214947.
- [117] Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98(5, Part 1), 1076-1107.
- [118] Gregory, R. (2009). Breaking sharply with the past: Government employment in New Zealand. *The State at Work, Volume*, 40.
- [119] Grohmann, A., Klühs, T., & Menkhoff, L. (2018). Does financial literacy improve financial inclusion? Cross country evidence. *World Development*, 111, 84-96.
- [120] Gustafsson, B., & Johansson, M. (1999). In search of smoking guns: What makes income inequality vary over time in different countries?. *American Sociological Review*, 64(4), 585–605.
- [121] Gygli, S., Haelg, F., Potrafke, N., & Sturm, J.-E. (2019). The KOF Globalisation Index – Revisited. *Review of International Organizations*, 14(3), 543–574. <https://doi.org/10.1007/s11558-019-09344-2>.
- [122] Hacker, J. S., & Pierson, P. (2010). Winner-take-all politics: How Washington made the rich richer—and turned its back on the middle class. Simon and Schuster.
- [123] Hager, S. B. (2020). Varieties of top incomes?. *Socio-Economic Review*, 18(4), 1175-1198.

- [124] Hailemariam, A., Sakutukwa, T., & Dzhumashev, R. (2021). Long-term determinants of income inequality: Evidence from panel data over 1870–2016. *Empirical Economics*, 61(4), 1935-1958.
- [125] Haldane, A. (2015, November). Labour's share. In Speech at the Trades Union Congress, London. Available online at: <https://www.bankofengland.co.uk/speech/2015/labours-share> [Accessed 30 November 2018].
- [126] Hamori, S., & Hashiguchi, Y. (2012). The effect of financial deepening on inequality: Some international evidence. *Journal of Asian Economics*, 23(4), 353–359.
- [127] Hanck, C. (2013). Cross-sectional correlation robust tests for panel cointegration. *Journal of Applied Statistics*, 36(7), 817-833.
- [128] Hagedorn, M., Manovskii, I., & Mitman, K. (2019). The fiscal multiplier (No. w25571). *National Bureau of Economic Research*.
- [129] Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 1251-1271.
- [130] Heimberger, P. (2020). Does economic globalisation affect income inequality? A meta-analysis. *The World Economy*, 43(11), 2960–2982.
- [131] Heimberger, P. (2020). The dynamic effects of fiscal consolidation episodes on income inequality: Evidence for 17 OECD countries over 1978–2013. *Empirica*, 47(1), 53-81.
- [132] Herzer, D. (2016). Unions and income inequality: A Heterogeneous panel cointegration and causality analysis. *Labour*, 30(3), 318–346.
- [133] Heylen, F. (2023). *Macro-economie* (5th ed.) [Book]. Owl Press.
- [134] Heylen, F. H., & Van Rymentant, P. V. R. (2024, April 22). Short Run Effects of Fiscal Policy - Theory (22 April) [Presentation slides]. Fiscal Policy Class 9. Retrieved from <https://ufora.ugent.be/d21/le/content/822902/viewContent/2301843/View>
- [135] Hobijn, B., & Lagakos, D. (2005). Inflation inequality in the United States. *Review of Income and Wealth*, 51(4), 581-606.

- [136] Honohan, P. (2004). Financial development, growth and poverty: How close are the links?. In *Financial development and economic growth: Explaining the links* (pp. 1-37). London: Palgrave Macmillan UK.
- [137] Hwang, S., Lee, K., & Yim, G. (2022). Demand Shocks vs. Supply Shocks: Which Shocks Matter More in Income and Price Inequality?. *Bank of Korea WP*, 6.
- [138] Jacobs, A., & Heylen, F. (2021). Demographic change, secular stagnation and inequality: Automation as a blessing? (No. 21/1030). Ghent University, Faculty of Economics and Business Administration.
- [139] Jaravel, X. (2021). Inflation inequality: Measurement, causes, and policy implications. *Annual Review of Economics*, 13, 599-629.
- [140] Jaumotte, F., & Osorio-Buitron, C. (2015). Inequality and labor market institutions.
- [141] Jaumotte, F., Lall, S., & Papageorgiou, C. (2013). Rising income inequality: Technology, or trade and financial globalization?. *IMF Economic Review*, 61(2), 271-309.
- [142] Jaumotte, F., & Osorio Buitron, C. (2020). Inequality: Traditional drivers and the role of union power. *Oxford Economic Papers*, 72(1), 25–58. <https://doi.org/10.1093/oep/gpz024>
- [143] Jones, C. I., & Kim, J. (2018). A Schumpeterian model of top income inequality. *Journal of Political Economy*, 126(5), 1785-1826.
- [144] Jordà, Ò. (2005). Estimation and inference of impulse responses by local projections. *American Economic Review*, 95(1), 161-182.
- [145] Jordà, Ò. (2023). Local Projections for Applied Economics. *Annual Review of Economics*, 15, 607-631.
- [146] Juhn, C., Murphy, K. M., Topel, R. H., Yellen, J. L., & Baily, M. N. (1991). Why has the natural rate of unemployment increased over time?. *Brookings Papers on Economic Activity*, 1991(2), 75-142.
- [147] Kaldor, N. (1957). A model of economic growth. *The Economic Journal*, 67(268), 591-624.

- [148] Kaplan, G., & Schulhofer-Wohl, S. (2017). Inflation at the household level. *Journal of Monetary Economics*, 91, 19-38.
- [149] Kaplan, G., & Violante, G. L. (2018). Microeconomic heterogeneity and macroeconomic shocks. *Journal of Economic Perspectives*, 32(3), 167-194.
- [150] Kaplan, G., Moll, B., & Violante, G. L. (2018). Monetary policy according to HANK. *American Economic Review*, 108(3), 697-743.
- [151] Kaplan, S. N., & Rauh, J. (2013). It's the market: The broad-based rise in the return to top talent. *Journal of Economic Perspectives*, 27(3), 35-56.
- [152] Kappes, S. A. (2023). Monetary policy and personal income distribution: A survey of the empirical literature. *Review of Political Economy*, 35(1), 211-230.
- [153] Karabarbounis, L., & Neiman, B. (2014). The global decline of the labor share. *The Quarterly Journal of Economics*, 129(1), 61-103.
- [154] Katz, L. F., & Murphy, K. M. (1992). Changes in relative wages, 1963–1987: supply and demand factors. *The Quarterly Journal of Economics*, 107(1), 35-78.
- [155] Känzig, D. R. (2021). The macroeconomic effects of oil supply news: Evidence from OPEC announcements. *American Economic Review*, 111(4), 1092-1125.
- [156] Kelsey, J. (2015). *The New Zealand experiment: A world model for structural adjustment?*. Bridget Williams Books.
- [157] Keynes, J. M. (1936). *The General Theory of Employment, Interest, and Money (1st ed.)*.
- [158] King, J. E. (2017). The literature on Piketty. *Review of Political Economy*, 29(1), 1-17.
- [159] Koeniger, W., Leonardi, M., & Nunziata, L. (2007). Labor market institutions and wage inequality. *ILR Review*, 60(3), 340-356.
- [160] Krueger, D., & Perri, F. (2006). Does income inequality lead to consumption inequality? Evidence and theory. *The Review of Economic Studies*, 73(1), 163-193.
- [161] Krugman, P., Cooper, R. N., & Srinivasan, T. N. (1995). Growing world trade: causes and consequences. *Brookings Papers on Economic Activity*, 1995(1), 327-377.

- [162] Krusell, P., Ohanian, L. E., Ríos-Rull, J. V., & Violante, G. L. (2000). Capital-skill complementarity and inequality: A macroeconomic analysis. *Econometrica*, 68(5), 1029-1053.
- [163] Kumhof, M. M., Lebarz, M. C., Ranciere, M. R., Richter, M. A. W., & Throckmorton, M. N. A. (2012). Income inequality and current account imbalances. *International Monetary Fund*.
- [164] Kunieda, T., Okada, K., & Shibata, A. (2014). Finance and inequality: How does globalization change their relationship?. *Macroeconomic Dynamics*, 18(5), 1091-1128.
- [165] Lazear, E. P., & Rosen, S. (1981). Rank-order tournaments as optimum labor contracts. *Journal of Political Economy*, 89(5), 841-864.
- [166] Lee, C. S. (2005). Income inequality, democracy, and public sector size. *American Sociological Review*, 70(1), 158-181.
- [167] Leibrecht, M., Klien, M., & Onaran, Ö. (2011). Globalization, welfare regimes and social protection expenditures in Western and Eastern European countries. *Public Choice*, 148, 569-594.
- [168] Levy, F., & Temin, P. (2007). Inequality and institutions in 20th century America.
- [169] Lewis, W. A. (2015). The evolution of the international economic order. Princeton University Press.
- [170] Lindert, P. H. (2015). Fertility and scarcity in America. Princeton University Press.
- [171] Lucas Jr, R. E., & Prescott, E. C. (1978). Equilibrium search and unemployment. In *Uncertainty in Economics* (pp. 515-540). Academic Press.
- [172] Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61(S1), 631-652.
- [173] Malinen, T. (2012). Estimating the long-run relationship between income inequality and economic development. *Empirical Economics*, 42, 209-233.
- [174] Marrero, G. A., & Rodríguez, J. G. (2023). Unfair inequality and growth. *The Scandinavian Journal of Economics*, 125(4), 1056-1092.

- [175] Martinez, J. (2018). Automation, growth and factor shares. In *2018 Meeting Papers* (Vol. 736). Society for Economic Dynamics.
- [176] Mauro, P., Romeu, R., Binder, A., & Zaman, A. (2015). A modern history of fiscal prudence and profligacy. *Journal of Monetary Economics*, 76, 55–70.
- [177] McKay, A., & Wolf, C. K. (2023). Monetary policy and inequality. *Journal of Economic Perspectives*, 37(1), 121-144.
- [178] McKee, K. (2012). Young people, homeownership and future welfare. *Housing studies*, 27(6), 853-862.
- [179] Michieka, N. M., & Gearhart III, R. S. (2022). Oil price changes and wages: A nonlinear and asymmetric approach. *Economic Change and Restructuring*, 55(1), 1–71.
- [180] Mirrlees, J. A. (1971). An exploration in the theory of optimum income taxation. *The Review of Economic Studies*, 38(2), 175-208.
- [181] Mishel, L., & Sabadish, N. (2012). CEO pay and the top 1%. *Economic Policy Institute Issue Brief*, 331, 1-7.
- [182] Munger, K. (2022). *Generation gap: Why the baby boomers still dominate American politics and culture*. Columbia University Press.
- [183] Navarro, V. (2020). Neoliberalism,” globalization,” unemployment, inequalities, and the welfare state. In *The Political Economy of Social Inequalities* (pp. 33-107).
- [184] Newey, W. K., & West, K. D. (1986). A simple, positive semi-definite, heteroskedasticity and autocorrelationconsistent covariance matrix.
- [185] Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica: Journal of the Econometric Society*, 1417–1426.
- [186] Nickell, S., & Layard, R. (1999). Labor market institutions and economic performance. *Handbook of Labor Economics*, 3, 3029–3084.
- [187] Nickell, S., Nunziata, L., & Ochel, W. (2005). Unemployment in the OECD since the 1960s. What do we know?. *The Economic Journal*, 115(500), 1–27.

- [188] OECD. (2023). ICTWSS database (Employment). Retrieved from <https://www.oecd.org/employment/ictwss-database.htm> (accessed on 1/01/2024).
- [189] OECD. (2024). OECD Economic Outlook, Volume 2024 Issue 1: Preliminary version. OECD Publishing, Paris. <https://doi.org/10.1787/69a0c310-en>.
- [190] Okun, A. M. (2015). *Equality and efficiency: The big tradeoff*. Brookings Institution Press.
- [191] Ostry, J. D., Loungani, P., & Furceri, D. (2016). Neoliberalism: Oversold? *Finance and Development*, 53(2), 38–41.
- [192] Ostry, M. J. D., Berg, M. A., & Tsangarides, M. C. G. (2014). Redistribution, inequality, and growth. *International Monetary Fund*.
- [193] Our World In Data based on OECD and Lindert. (n.d.). Social Expenditure %GDP - (OWID extrapolated series) [Dataset]. Our World In Data based on OECD and Lindert (2004) [Original Data].
- [194] Panizza, U. (2002). Income inequality and economic growth: Evidence from American data. *Journal of Economic Growth*, 7, 25-41.
- [195] Pasinetti, L. L. (2000). Critique of the neoclassical theory of growth and distribution. *PSL Quarterly Review*, 53(215).
- [196] Peck, J. (2017). *Offshore: Exploring the worlds of global outsourcing*. Oxford University Press.
- [197] Perotti, R. (1993). Political equilibrium, income distribution, and growth. *The Review of Economic Studies*, 60(4), 755-776.
- [198] Perotti, R. (1996). Growth, income distribution, and democracy: What the data say. *Journal of Economic Growth*, 1, 149-187.
- [199] Persson, T., & Tabellini, G. (1991). Is inequality harmful for growth? Theory and evidence.
- [200] Perugini, C., Hölscher, J., & Collie, S. (2016). Inequality, credit and financial crises. *Cambridge Journal of Economics*, 40(1), 227-257.

- [201] Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, 60(1), 13-50.
- [202] Peters, H., & Volwahren, M. (2017). Rising income inequality: Do not draw the obvious conclusions. *Intereconomics*, 52(2), 111–118.
- [203] Phelps, E. S. (1967). Phillips curves, expectations of inflation and optimal unemployment over time. *Economica*, 254-281.
- [204] Piketty, T. (1997). The dynamics of the wealth distribution and the interest rate with credit rationing. *The Review of Economic Studies*, 64(2), 173-189.
- [205] Piketty, T. (2014). *Capital in the twenty-first century*. Harvard University Press.
- [206] Piketty, T., & Saez, E. (2006). The evolution of top incomes: a historical and international perspective. *American economic review*, 96(2), 200-205.
- [207] Piketty, T., & Saez, E. (2013). Top incomes and the great recession: Recent evolutions and policy implications. *IMF Economic Review*, 61(3), 456-478.
- [208] Prettnner, K., & Bloom, D. E. (2020). Automation and its macroeconomic consequences: Theory, evidence, and social impacts. Academic Press.
- [209] Raczynski, M. (2022). Monetary policy and economic inequality: A literature review. *Bank i Kredyt*, 53(2), 231-278.
- [210] Rajan, R. (2010). How inequality fueled the crisis. *Project Syndicate*, 9.
- [211] Rajan, R. G., & Zingales, L. (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics*, 69(1), 5-50.
- [212] Rawdanowicz, Ł., Wurzel, E., & Christensen, A. K. (2013). The equity implications of fiscal consolidation.
- [213] Rebelo, S. (1991). Long-run policy analysis and long-run growth. *Journal of Political Economy*, 99(3), 500-521.
- [214] Repetto, R. (1978). The interaction of fertility and the size distribution of income. *Journal of Development Studies*, 14(4), 22-39.

- [215] Rinz, K. (2018). Labor market concentration, earnings inequality, and earnings mobility. *Center for Administrative Records Research and Applications Working Paper*, 10.
- [216] Rinz, K. (2022). Labor market concentration, earnings, and inequality. *Journal of Human Resources*, 57(S), S251-S283.
- [217] Romer, C. D., & Romer, D. H. (1998). Monetary policy and the well-being of the poor.
- [218] Rosen, S. (1981). The economics of superstars. *The American Economic Review*, 71(5), 845-858.
- [219] Roser, M., & Cuaresma, J. C. (2016). Why is income inequality increasing in the developed world?. *Review of Income and Wealth*, 62(1), 1–27.
- [220] Rothstein, J. (2017). The Great Recession and Its Aftermath: What Role for Structural Changes? *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 3(3), 22-49.
- [221] Saez, E., & Zucman, G. (2020). The rise of income and wealth inequality in America: Evidence from distributional macroeconomic accounts. *Journal of Economic Perspectives*, 34(4), 3-26.
- [222] Salop, S. C. (1979). A model of the natural rate of unemployment. *The American Economic Review*, 69(1), 117-125.
- [223] Sarafidis, V., & Robertson, D. (2009). On the impact of error cross-sectional dependence in short dynamic panel estimation. *The Econometrics Journal*, 12(1), 62–81.
- [224] Sauer, P., Rao, N. D., & Pachauri, S. (2023). Explaining income inequality trends: An integrated approach. In *Mobility and Inequality Trends* (Vol. 30, pp. 1-47). Emerald Publishing Limited.
- [225] Scholte, J. A. (2017). Globalization: A critical introduction. Bloomsbury Publishing.
- [226] Sequeira, T. N., Santos, M., & Ferreira-Lopes, A. (2017). Income inequality, TFP, and human capital. *Economic Record*, 93(300), 89–111.
- [227] Shin, I. (2012). Income inequality and economic growth. *Economic Modelling*, 29(5), 2049-2057.

- [228] Sintos, A. (2023). Does inflation worsen income inequality? A meta-analysis. *Economic Systems*, 101146.
- [229] Solt, F. (2020). Measuring income inequality across countries and over time: The Standardized World Income Inequality Database. *Social Science Quarterly*, 101(3), 1183–1199. SWIID Version 9.6, December 2023.
- [230] Staiger D.O., & Stock, J.H. (1994). Instrumental variables regression with weak instruments. *NBER*
- [231] Stansbury, A., & Summers, L. H. (2020). The declining worker power hypothesis: An explanation for the recent evolution of the American economy (No. w27193). *National Bureau of Economic Research*.
- [232] Stiglitz, J. E. (2012). *The price of inequality: How today's divided society endangers our future*. WW Norton & Company.
- [233] Stiglitz, J. E. (2015). Macroeconomic fluctuations, inequality, and human development. In *Macroeconomics and Human Development* (pp. 31-58). Routledge.
- [234] Stiglitz, J. E. (2017). *Globalization and its discontents revisited: Anti-globalization in the era of Trump*. WW Norton & Company.
- [235] Stolper, W. F., & Samuelson, P. A. (1941). Protection and real wages. *The Review of Economic Studies*, 9(1), 58-73.
- [236] Tridico, P. (2018). The determinants of income inequality in OECD countries. *Cambridge Journal of Economics*, 42(4), 1009-1042.
- [237] UNU-WIDER. (2022). World Income Inequality Database (WIID) Companion dataset (wiidcountry and/or wiidglobal). Version 30 June 2022. <https://doi.org/10.35188/UNU-WIDER/WIIDcomp-300622>.
- [238] Van Beveren, I. (2012). Total factor productivity estimation: A practical review. *Journal of economic surveys*, 26(1), 98-128.
- [239] Van Treeck, T. (2014). Did inequality cause the US financial crisis? *Journal of economic Surveys*, 28(3), 421-448.

- [240] Varian, H. R. (1992). *Microeconomic Analysis*. New York: Norton. ISBN: 0393957357 9780393957358.
- [241] Venieris, Y. P., & Gupta, D. K. (1986). Income distribution and sociopolitical instability as determinants of savings: a cross-sectional model. *Journal of Political Economy*, 94(4), 873-883.
- [242] Violante, G. L. (2008). Skill-biased technical change. *The new Palgrave dictionary of economics*, 2, 1-6.
- [243] Violante, G. L. (2008). Skill-biased technical change. *The new Palgrave dictionary of economics*, 2, 1-6.
- [244] Walter, S. (2010). Globalization and the welfare state: Testing the microfoundations of the compensation hypothesis. *International Studies Quarterly*, 54(2), 403–426.
- [245] Western, B., & Rosenfeld, J. (2011). Unions, norms, and the rise in US wage inequality. *American Sociological Review*, 76(4), 513-537.
- [246] Willetts, D. (2010). *The Pinch: How the baby boomers took their children's future-and why they should give it back*. Atlantic Books Ltd.
- [247] World Development Indicators. (n.d.). [Dataset]. World Bank. <https://databank.world-bank.org/indicator/SI.POV.NAHC/1ff4a498/Popular-Indicators>.
- [248] Woo, J., Bova, E., Kinda, T., & Sophia Zhang, Y. (2017). Distributional consequences of fiscal adjustments: what do the data say?. *IMF Economic Review*, 65, 273-307.
- [249] Woo, J., Bova, M. E., Kinda, M. T., & Zhang, M. Y. S. (2013). Distributional consequences of fiscal consolidation and the role of fiscal policy: what do the data say?. *International Monetary Fund*.
- [250] Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.
- [251] Yagan, D. (2019). Employment hysteresis from the great recession. *Journal of Political Economy*, 127(5), 2505-2558.
- [252] Zucman, G. (2015). *The hidden wealth of nations: The scourge of tax havens*. University of Chicago Press.

Appendix 1.1: Unit Root Tests

The determination of the number of lags in the ADF tests for the individual countries relies on AIC information criteria. An intercept is included for all variables except inflation. For the ADF tests on the residuals, deterministic terms are not included.

Table 1: Unit root tests

Variable	Number of countries with p-value below 10% in the ADF test	Hanck panel unit root test. Reject unit root?
NETGINI	7 countries out of 35	No
TOP10/BOT-TOM20	4 countries out of 35	No
MARKETGINI	4 countries out of 21	No
GDPCAPITA	0 countries out 35	No
INFLATION	13 countries out of 35	Yes
TFP	5 countries out of 35	No
SCHOOLING	1 country out of 35	No
OPEN	2 countries out of 35	No
KOF	2 countries out 35	No
DEPOSITS	0 countries out of 35	No
UNION	5 countries out of 35	Yes
SOCIALSPENDING	9 countries out of 35	Yes
REV	11 countries out of 35	Yes
DEPEN	1 country out of 35	No

Table 2: Cointegration tests for Table 2

Residuals	Number of countries with p-value below 10% in the ADF test	Hanck panel unit root test. Reject unit root?
(1)	28 countries out of 34	Yes
(2)	28 countries out of 34	Yes
(3)	17 countries out of 21	Yes
(4)	21 countries out of 24	Yes

Appendix 1.2: Fixed Effects specifications

Table 3: Fixed effects specifications (two-ways)

	<i>Dependent variable:</i>			
	NETGINI	TOP10/BOTTOM20	MARKETGINI	NETGINI
	(1)	(2)	(3)	(4)
log(GDPCAPITA)	-2.373*** (0.856)	-1.028*** (0.303)	-5.23** (0.706)	-1.283 (1.006)
log(INFLATION)	-3.165** (1.240)	-1.019* (0.593)	-0.622 (1.389)	-3.407*** (1.205)
TFP	0.116*** (0.042)	0.030** (0.013)	0.291*** (0.038)	0.154*** (0.041)
SCHOOLING	-0.354** (0.171)	-0.121* (0.064)	0.842 (0.158)	-0.525*** (0.183)
TFP * SCHOOLING	-0.025*** (0.007)	-0.007*** (0.002)	-0.0346*** (0.006)	-0.031*** (0.007)
OPEN	-0.019 (0.018)	-0.003 (0.004)	0.054* (0.012)	-0.001 (0.021)
KOF	0.070*** (0.010)	0.021*** (0.003)	0.081*** (0.011)	0.062*** (0.011)
DEPOSITS	0.014*** (0.005)	0.003*** (0.001)	0.022*** (0.004)	0.010* (0.005)
UNION	-0.048*** (0.015)	-0.012*** (0.004)	0.027* (0.015)	-0.063*** (0.018)
SOCIALSPENDING	0.103*** (0.029)	0.021*** (0.008)	0.051* (0.021)	0.100*** (0.028)
REV	-0.111*** (0.019)	-0.031*** (0.005)	-0.139*** (0.019)	-0.108*** (0.020)
DEPEN	-0.040 (0.034)	-0.005 (0.007)	-0.096*** (0.028)	0.020 (0.034)
Observations	1,286	1,286	807	1038
R ²	0.276	0.211	0.351	0.350
Adjusted R ²	0.249	0.181	0.285	0.326

³³The fourth specification is the specification that does not include the “new” OECD members.
Note: The reported standard errors are corrected using a Newey-West (1986) correction.
 * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Appendix 1.3: Non-linear CCE specification for NETGINI

Table 4: Non-linear CCE specification for NETGINI

	Dependent variable:
	NETGINI
log(GDPCAPITA)	-4.151*** (0.749)
log(INFLATION)	-2.769*** (0.958)
TFP	0.138*** (0.042)
SCHOOLING	-0.444** (0.190)
TFP * SCHOOLING	-0.019*** (0.007)
OPEN	0.029** (0.015)
KOF	0.037*** (0.010)
DEPOSITS	0.005 (0.004)
UNION	-0.007 (0.028)
UNION ²	-0.001*** (0.0003)
SOCIALSPENDING	-0.016 (0.018)
REV	-0.067*** (0.015)
DEPEN	0.014 (0.030)
Observations	1,235
R ²	0.654
Adjusted R ²	0.630
F Statistic	46.364***

*Note: The reported standard errors are corrected using a Newey-West (1986) correction.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$*

Appendix 1.4: CCE specification for NETGINI with *Inflation* instead of log(INFLATION)

Table 5: CCE specification for NETGINI with *Inflation* instead of log(INFLATION)

	Dependent variable:
	NETGINI
log(GDPCAPITA)	-4.610*** (0.715)
<i>Inflation</i>	-0.020*** (0.006)
TFP	0.127*** (0.041)
SCHOOLING	-0.473** (0.190)
TFP * SCHOOLING	-0.017** (0.007)
OPEN	0.029** (0.015)
KOF	0.043*** (0.010)
DEPOSITS	0.008** (0.004)
UNION	-0.087*** (0.017)
SOCIALSPENDING	-0.017 (0.019)
REV	-0.081*** (0.014)
DEPEN	-0.0002 (0.029)
Observations	1,235
R ²	0.648
Adjusted R ²	0.624
F Statistic	46.159***
Note: The reported standard errors are corrected using a Newey-West (1986) correction. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$	

Appendix 1.5: CCE mean group specification for NETGINI

Table 6: CCE mean group specification for NETGINI

	Dependent variable:
	NETGINI
log(GDPCAPITA)	−4.940*** (1.736)
log(INFLATION)	−2.292 (3.228)
TFP	0.423 (0.411)
SCHOOLING	−1.475*** (0.472)
TFP * SCHOOLING	−0.030 (0.042)
OPEN	0.008 (0.043)
KOF	0.010 (0.019)
DEPOSITS	0.018 (0.014)
UNION	−0.042** (0.018)
SOCIALSPENDING	−0.015 (0.047)
REV	−0.032 (0.036)
DEPEN	−0.238 (0.149)
Observations	1,235
R ²	0.988

*Note: The reported standard errors are corrected using a Newey-West (1986) correction.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$*

Appendix 1.6: CCE specification for NETGINI with TERT

Table 7: CCE specification for NETGINI with TERT

	Dependent variable:
	NETGINI
log(GDPCAPITA)	-4.874*** (0.738)
log(INFLATION)	-1.812* (1.017)
TFP	0.054*** (0.016)
TERT	0.293 (0.603)
TFP * TERT	-0.249** (0.121)
OPEN	0.022 (0.014)
KOF	0.039*** (0.010)
DEPOSITS	0.007* (0.004)
UNION	-0.078*** (0.017)
SOCIALSPENDING	-0.030* (0.018)
REV	-0.088*** (0.015)
DEPEN	-0.040 (0.026)
Observations	1,235
R ²	0.641
Adjusted R ²	0.616
F Statistic	44.720***

Note: The reported standard errors are corrected using a Newey-West (1986) correction.
p<0.1; **p<0.05; *p<0.01*

Appendix 1.7: Additional Robustness tests

Table 8: Additional Robustness tests

	<i>Dependent variable:</i>			
	SD	log(NETGINI)	NETGINI	NETGINI
	(1)	(2)	(3)	(4)
lag(NETGINI, 1:4)1			0.869*** (0.051)	
lag(NETGINI, 1:4)2			-0.042 (0.064)	
lag(NETGINI, 1:4)3			-0.006 (0.065)	
lag(NETGINI, 1:4)4			-0.071 (0.044)	
log(GDPCAPITA)	-1.742*** (0.105)	-0.142*** (0.022)	-1.248*** (0.394)	-4.845*** (0.818)
log(INFLATION)	-0.252*** (0.094)	-0.066** (0.027)	-0.737** (0.364)	-2.081* (1.178)
TFP	0.002 (0.004)	0.003** (0.001)	0.024 (0.020)	0.129*** (0.035)
SCHOOLING	-0.111*** (0.025)	-0.010* (0.005)	-0.139** (0.069)	-0.190 (0.166)
TFP * SCHOOLING	0.0003 (0.001)	-0.0004* (0.0002)	-0.006* (0.003)	-0.025*** (0.007)
OPEN	0.010*** (0.003)	0.001* (0.0005)	0.010** (0.005)	-0.007 (0.018)
KOF	0.002 (0.001)	0.001*** (0.0003)	0.008* (0.004)	0.055*** (0.010)
DEPOSITS	0.001 (0.001)	0.0002* (0.0001)	0.002 (0.001)	0.010** (0.004)
UNION	-0.003** (0.002)	-0.003*** (0.001)	-0.015** (0.006)	-0.071*** (0.015)
SOCIALSPENDING	-0.006*** (0.002)	-0.001 (0.001)	-0.003 (0.010)	0.011 (0.017)
REV	-0.011*** (0.002)	-0.003*** (0.001)	-0.012* (0.007)	-0.090*** (0.016)
DEPEN	0.011*** (0.004)	-0.001 (0.001)	-0.0001 (0.011)	0.041 (0.028)
Observations	1,235	1,235	1,192	1,235
R ²	0.949	0.662	0.889	0.561
Adjusted R ²	0.945	0.638	0.881	0.532

Note: The reported standard errors are corrected using a Newey-West (1986) correction.
 * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Appendix 1.8: CCE specification with instruments for the stationary variables

Table 9: CCE specification with instruments for the stationary variables

<i>Dependent variable:</i>	
	NETGINI
log(GDPCAPITA)	-3.317* (1.877)
log(INFLATION)	-5.264*** (2.038)
TFP	0.506** (0.207)
SCHOOLING	0.454 (0.618)
TFP * SCHOOLING	-0.067** (0.028)
OPEN	0.001 (0.029)
KOF	0.071*** (0.019)
DEPOSITS	-0.079 (0.067)
UNION	-0.087*** (0.033)
SOCIALSPENDING	0.031 (0.086)
REV	-0.101*** (0.031)
DEPEN	0.030 (0.050)
Observations	1,174
R ²	0.474
Adjusted R ²	0.436
F Statistic	1,262.324***

*Note: The reported standard errors are corrected using a Newey-West (1986) correction.
*p<0.1; **p<0.05; ***p<0.01*

Appendix 1.9: Figures of the exogenous shock variables

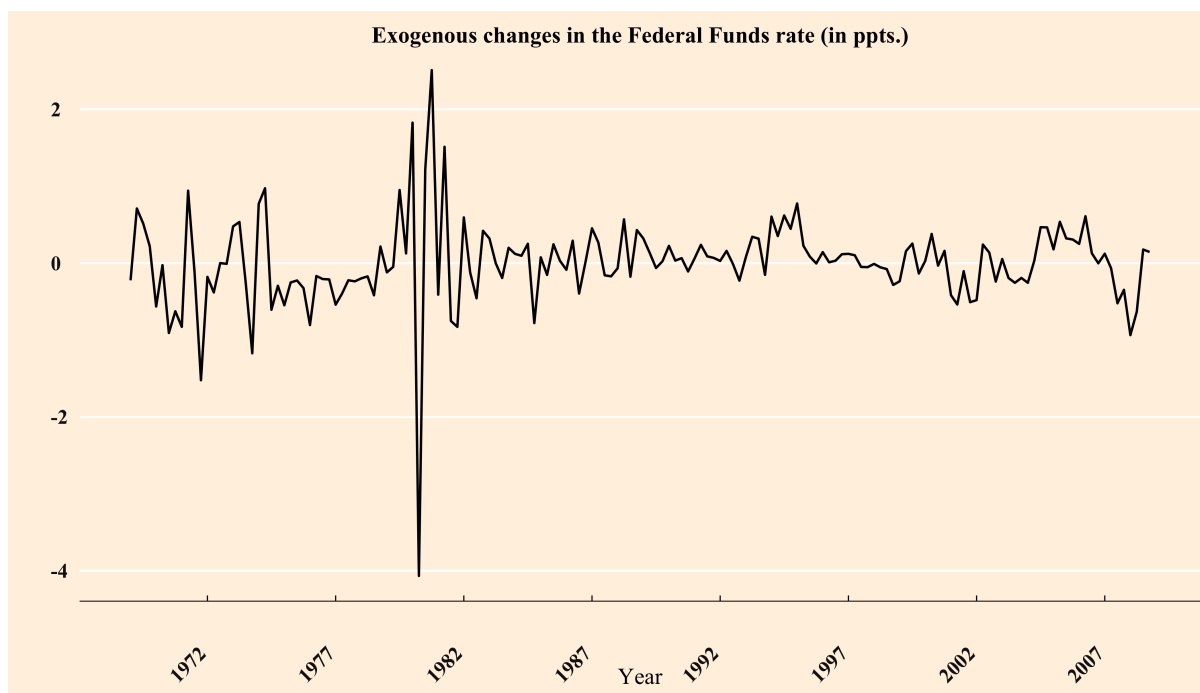


Figure 1: Exogenous US monetary policy shocks identified with the narrative approach (IV-MON)

Source: Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent Bystanders? Monetary policy and inequality. *Journal of Monetary Economics*, 88, 70-89.

The steep increase of the series in 1980 represents the start of the Volcker disinflation period.

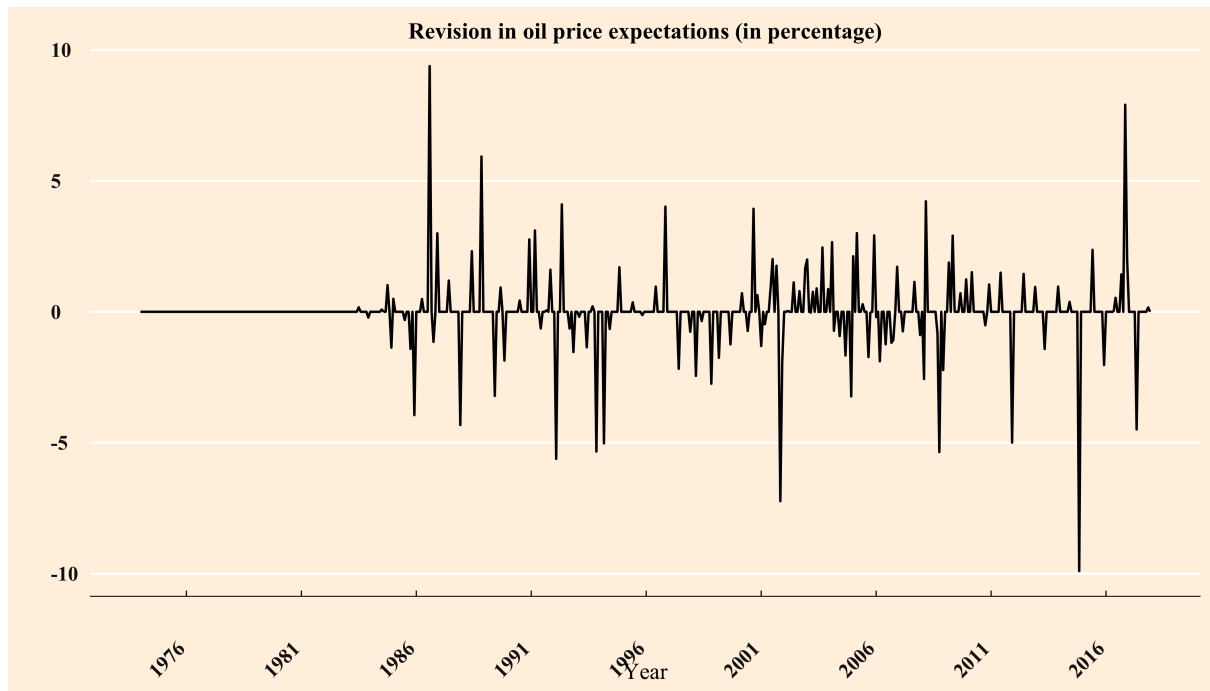


Figure 2: High-frequency data OPEC Oil supply news series (IV-OIL)

Source: Känzig, D. R. (2021). The macroeconomic effects of oil supply news: Evidence from OPEC announcements. *American Economic Review*, 111(4), 1092-1125.

Appendix 1.10: Local Projections analysis with control variables

The control variables included in the expansionary monetary policy specifications are the change in real GDP growth, the change in the unemployment rate, and the change in the crude oil price.

The control variables included in the negative (oil) supply specifications are the change in real GDP growth, the change in the unemployment rate, and the change in the interest rate on three-month treasury bills.

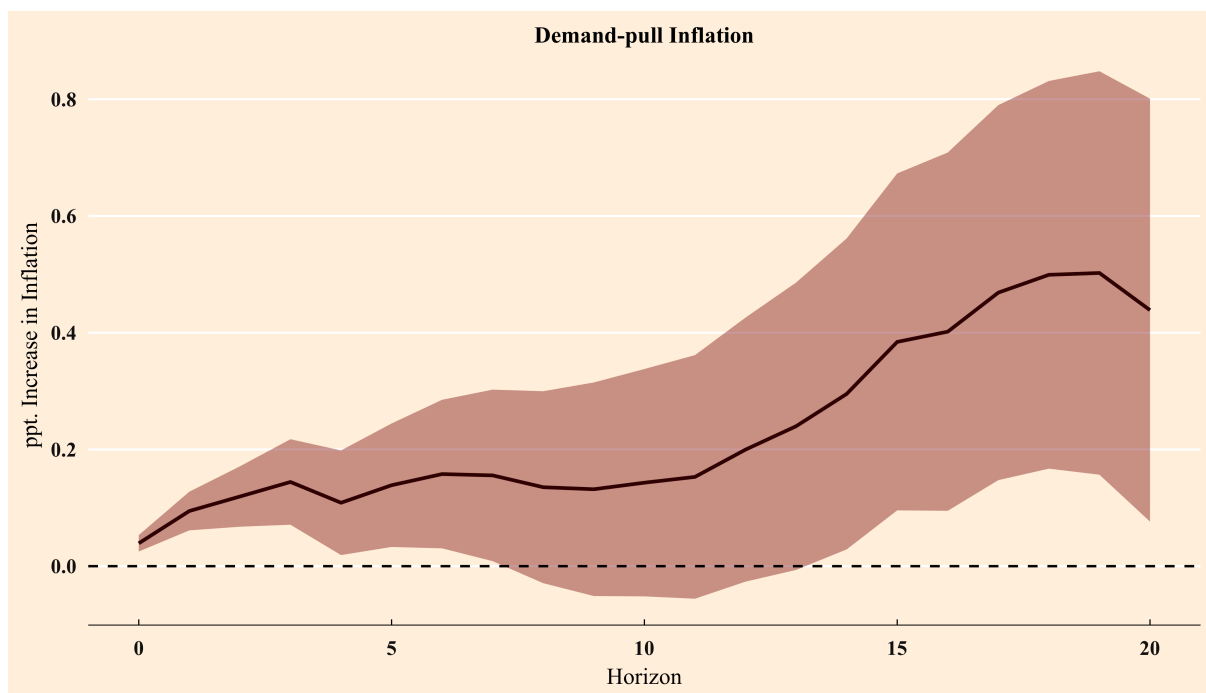


Figure 3: Response of inflation to a 100 basis point reduction in the federal funds rate

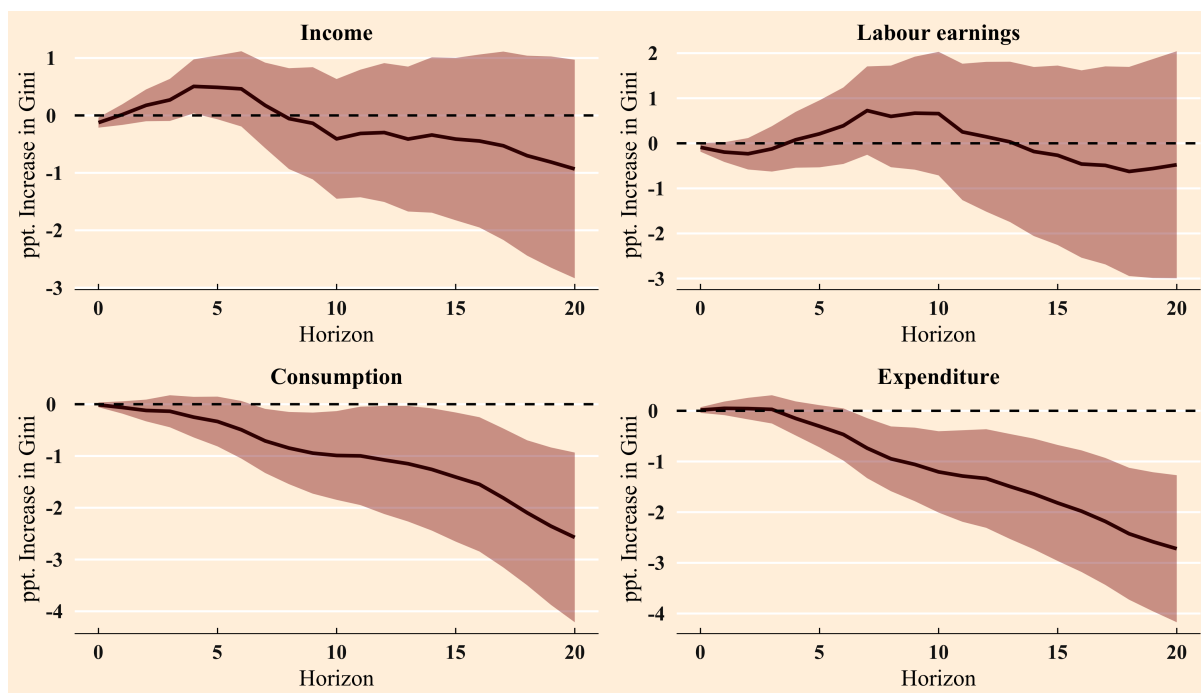


Figure 4: Response of economic inequality to a 100 basis point reduction in the federal funds rate

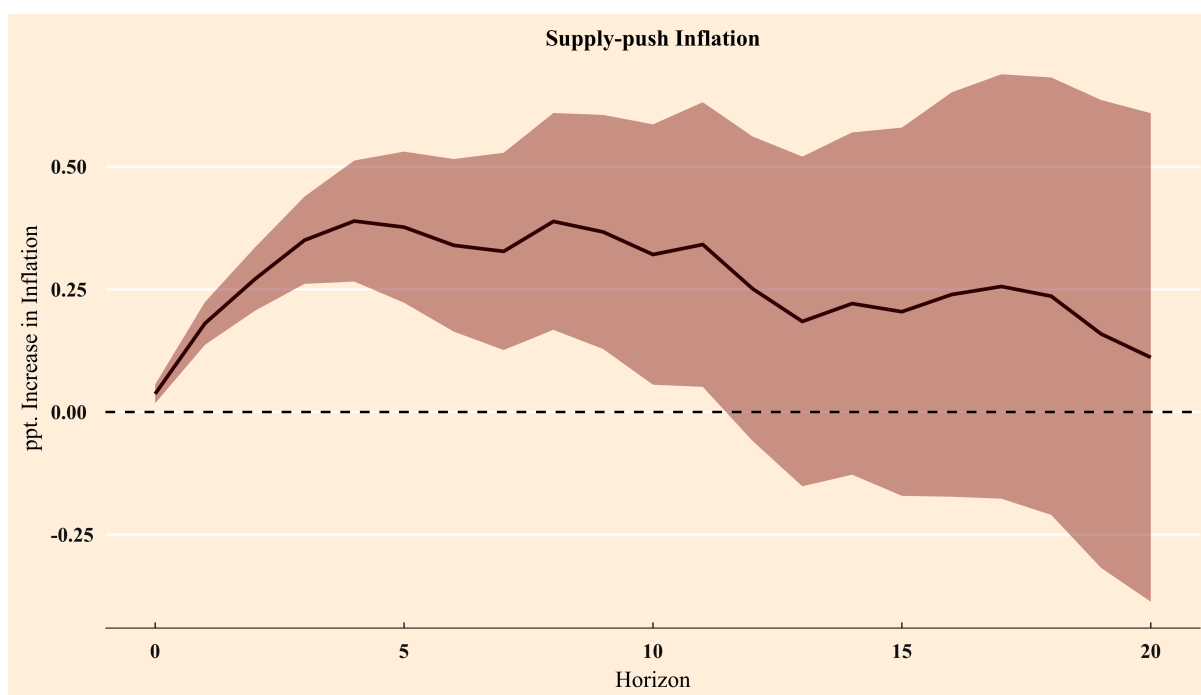


Figure 5: Response of inflation to a 30% shock in the real oil price

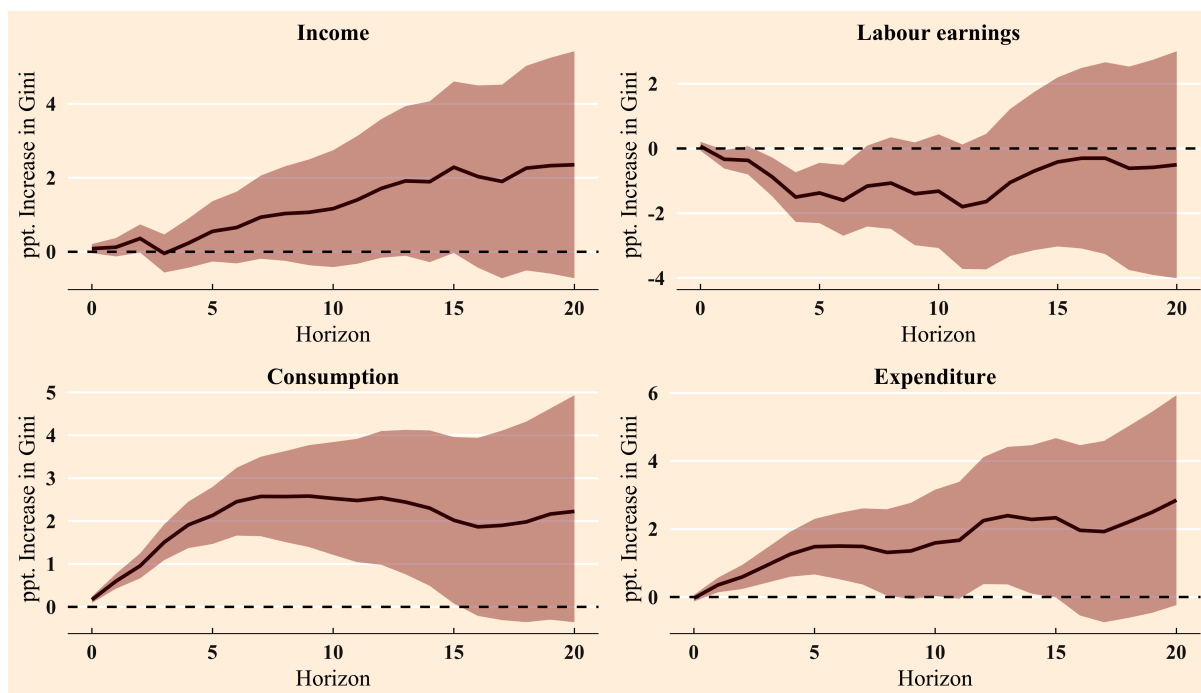


Figure 6: Response of economic inequality to a 30% shock in the real oil price

Appendix 1.11: Details about the effects of different policy responses to a negative supply shock

Table 10: Difference in the impulse response functions (for inflation) following a contractionary versus an expansionary monetary policy response

Horizon	Inflation
4	-0.04
5	-0.32
6	-0.19
7	-0.42
8	-0.41
9	0.01
10	-0.26
11	0.01
12	-0.01
13	-0.30
14	-0.39
15	-0.28
16	-0.24
17	-0.33
18	-0.33
19	-0.48
20	-0.52

Table 11: Difference in the impulse response functions (for inequality) following a contractionary versus an expansionary monetary policy response

Horizon	Total Income	Labour earnings	Consumption	Expenditure
4	-0.13	-0.05	0.14	-0.20
5	0.36	-0.25	-0.06	-0.19
6	0.23	-0.42	-0.17	-0.08
7	0.95	-0.60	-0.08	0.16
8	1.58	-0.46	-0.01	0.89
9	1.34	-0.28	0.55	1.53
10	1.53	-0.39	1.19	2.07
11	1.68	-0.54	1.36	2.53
12	1.13	-0.68	1.52	2.52
13	1.25	-1.06	1.65	2.30
14	1.29	-1.19	1.51	2.02
15	1.03	-1.79	1.76	1.99
16	1.47	-2.18	1.78	2.01
17	1.78	-2.73	1.80	2.00
18	2.31	-3.04	1.83	2.38
19	2.40	-1.93	1.71	2.56
20	3.21	-1.49	1.97	2.71

Appendix 1.12: Summary statistics pertaining to the dataset

The datasets listed below were used for interpolating and extrapolating missing values, as well as for cross-validating the reported datasets presented in Table 2:

- AMECO
- Barro and Lee (2015); Lee and Lee (2016)—with major processing by Our World in Data
- Bergeaud, A., Cette, G. and Lecat, R. (2016): "Productivity Trends in Advanced Countries between 1890 and 2012," *Review of Income and Wealth*, vol. 62(3), pages 420–444.
- Eurostat
- Federal Reserve Economic Data (FRED)
- Madsen, J. B., Islam, M. R., & Doucouliagos, H. (2018). Inequality, financial development and economic growth in the OECD, 1870–2011. *European Economic Review*, 101, 605-624.
- OECD (2024), Multifactor productivity (indicator). doi: 10.1787/a40c5025-en
- OECD (2024), Social spending (indicator). doi: 10.1787/7497563b-en
- Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2017. "Macrofinancial History and the New Business Cycle Facts." in *NBER Macroeconomics Annual 2016*, volume 31, edited by Martin Eichenbaum and Jonathan A. Parker. Chicago: University of Chicago Press.
- Stone Center on Socio-Economic Inequality

Average Time Series Correlation Table $[\frac{1}{N} \sum_{i=1}^N \text{corr}(X_i, Y_i)]$

	NETGINI	GDPCAPITA	INFLATION	TFP	SCHOOLING	OPEN	KOF	DEPOSITS	UNION	SOCIALSPENDING	REV	DEPEN
NETGINI	1	0.193	-0.201	0.144	0.215	0.114	0.200	0.110	-0.223	-0.521	-0.634	0.196
GDPCAPITA	0.193	1	-0.657	0.464	0.900	0.885	0.901	0.716	-0.738	0.447	0.359	0.811
INFLATION	-0.201	-0.657	1	-0.356	-0.620	-0.672	-0.629	-0.523	0.607	-0.412	-0.391	-0.546
TFP	0.144	0.464	-0.356	1	0.341	0.356	0.350	0.361	-0.315	-0.117	-0.124	0.270
SCHOOLING	0.215	0.900	-0.620	0.341	1	0.888	0.876	0.713	-0.716	0.274	0.205	0.817
OPEN	0.114	0.885	-0.672	0.350	0.888	1	0.884	0.684	-0.738	0.331	0.295	0.830
KOF	0.200	0.901	-0.629	0.361	0.876	0.884	1	0.713	-0.720	0.515	0.468	0.762
DEPOSITS	0.110	0.716	-0.523	-0.315	0.713	0.684	0.713	1	-0.573	0.170	0.016	0.687
UNION	-0.223	-0.738	0.607	-0.315	-0.716	-0.738	-0.720	-0.573	1	0.202	0.385	-0.615
SOCIALSPENDING	-0.521	0.447	-0.412	-0.117	0.274	0.331	0.515	0.170	0.202	1	0.725	0.734
REV	-0.634	0.359	-0.391	-0.124	0.205	0.295	0.468	0.016	0.385	0.725	1	0.527
DEPEN	0.196	0.811	-0.546	0.270	0.817	0.830	0.762	0.687	-0.615	0.734	0.527	1

Cross Sectional Correlation Table for 2015 [$corr(X_{2015}, Y_{2015})$]

	NETGINI	GDPCAPITA	INFLATION	TFP	SCHOOLING	OPEN	KOF	DEPOSITS	UNION	SOCIALSPENDING	REV	DEPEN
NETGINI	1	-0.603	0.507	-0.445	0.636	-0.215	-0.352	0.110	-0.223	-0.519	-0.726	-0.214
GDPCAPITA	-0.603	1	-0.330	0.017	0.539	0.685	0.727	0.638	0.353	0.352	0.400	0.335
INFLATION	0.507	-0.330	1	0.297	-0.556	-0.260	-0.478	-0.146	-0.017	-0.515	-0.345	-0.574
TFP	-0.445	0.017	0.297	1	-0.153	0.148	0.041	0.303	-0.278	0.094	-0.021	-0.100
SCHOOLING	0.636	0.539	-0.556	-0.153	1	0.278	0.464	0.308	0.032	0.374	0.247	0.440
OPEN	-0.215	0.685	-0.556	0.148	0.278	1	0.614	0.647	0.212	0.205	0.207	0.023
KOF	-0.352	0.727	-0.260	0.041	0.464	0.614	1	0.366	0.342	0.542	0.591	0.528
DEPOSITS	0.110	0.638	-0.478	0.303	0.308	0.647	0.366	1	0.016	0.137	0.029	0.210
UNION	-0.223	0.353	-0.017	-0.278	0.032	0.212	0.342	0.016	1	0.347	0.372	0.126
SOCIALSPENDING	-0.519	0.352	-0.515	0.094	0.374	0.205	0.542	0.137	0.347	1	0.563	0.593
REV	-0.726	0.400	-0.345	-0.021	0.247	0.207	0.591	0.029	0.372	0.563	1	0.613
DEPEN	-0.214	0.335	-0.574	0.100	0.440	0.023	0.528	0.210	0.126	0.593	0.613	1

Descriptive statistics

Variable	min	mean	max	sd
NETGINI	17.7170	33.3551	59.5050	8.0131
MARKETGINI	32.4000	47.2821	56.4000	4.6882
TOP10	16.6650	26.2672	48.8370	5.9362
BOTTOM20	1.6950	7.5300	12.6300	1.9758
GDPCAPITA	2713.7300	31048.0000	112226.9100	16776.1500
<i>Inflation</i>	-4.4781	12.7258	1281.4430	55.5116
TFP	51.0406	97.4490	164.7964	13.9676
SCHOOLING	2.5800	9.9108	14.3661	2.1440
OPEN	2.0677	27.0366	171.1036	22.0348
KOF	6.7511	60.7740	99.7813	22.9960
DEPOSITS	7.6433	67.5200	462.1295	53.5166
UNION	3.1010	31.4066	93.9000	21.1349
SOCIALSPENDING	1.7030	18.4057	32.2726	5.8012
EXP	7.0000	36.6346	59.6747	11.8580
DEPEN	5.9265	19.5828	50.5686	6.6089