MIMS – Research

Macro Research Team

Report – December 2023

The Effects of Monetary Policy on Social Inequality

Following the Global Financial Crisis and the subsequent implementation of unconventional monetary policies by central banks (i.e., quantitative easing), there had been many concerns that these policies would have eventually contributed to social inequality. Nowadays, in the realities of supply shocks and high inflation, the implementation of monetary policy tightening by most developed economies' central banks has attracted even more attention to the topic. Still, the nature of the relationship between the pass-through of macroeconomic policies and income and wealth distribution in an economy is indefinite and, thus, remains an object of great research interest.

In general, in this area of research, economists use both direct and indirect kinds of measures for quantifying the impact of monetary policy on inequality. The direct measure assumes consumption levels as the indicator of inequality within the economy. Alternatively, the indirect measure aggregates the various monetary transmission channels to provide a more holistic analysis of inequality levels across different households.

In our December report we mostly refer to the indirect methods to assess whether monetary policy can be deemed to have a material impact on inequality levels. Specifically, we will focus on the two main measures of inequality that can be directly or indirectly affected through monetary policy, namely, income and wealth inequality.

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Income Inequality

Even before the outbreak of the Covid-19 pandemic, many European citizens believed that governments' interventions were more than necessary to reduce inequality and disparities. The pandemic further "exacerbated and raised awareness of disparities between the rich and the poor "(Hansen N., Lin A., Mano R., 2020).

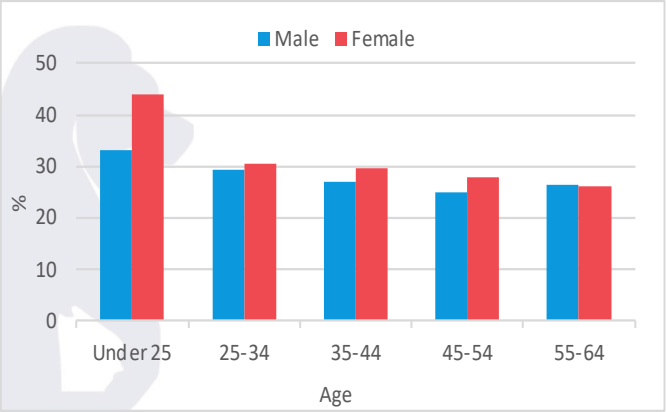
For instance, some research shows that in the Euro area, the employees in lockdown-affected sectors were more likely to be younger workers (aged under 25). Moreover, women were more likely to be employed in the sectors affected by lockdown (*Figure 1*).

At the same time, the effect of Covid-19 happened to be regressive across the income distribution, with the lower quintiles being exposed to higher risks in terms of labor income reduction and unemployment (*Figure 2*). Moreover, the pandemic led to housing insecurities with many individuals facing eviction and homelessness

because of the inability to pay rent. Also, the richest quintiles had to face the strong repercussions of the pandemic, as they were forced to reassess their priorities in terms of everyday consumption and investments.

Figure 1

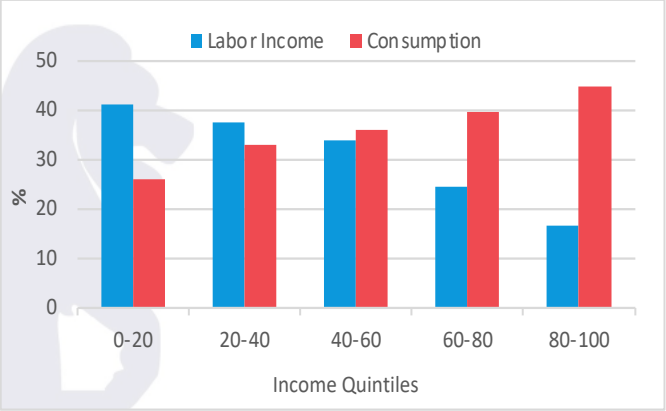
Employees in lockdown sectors by age and gender, %



Source: Monetary Policy and Inequality; Dossche, Slačálek, & Wolswijk; (2021, February)

Figure 2

Income and consumption exposed to lockdown measures by income quintiles, %



Source: Monetary Policy and Inequality; Dossche, Slačálek, & Wolswijk; (2021, February)

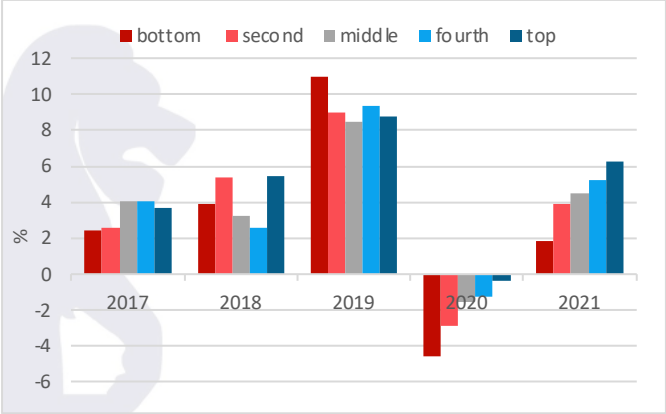
Briefly considering how Covid-19 affected the income quintiles distribution in the US, let's now visualize how the amount of income (mean estimation) trend associated with each quintile changed throughout the years, with a special focus on the pre and post Covid-19 situation.

Mean income estimation by quintiles decreased between 2019 and 2020 as a direct consequence of the pandemic (*Figure 3*). However, this did not excessively interfere with the overall increasing trend that the various quintiles were experiencing in the calculation of their medium income.

Thus, the pandemic only exacerbated a process that was present since the 1980s, but how can this (never-ending) trend of rising inequality be explained? The first answer to this question has its roots in the distributional effects of technological changes: technological advancements show a bias towards skilled labor, resulting in a much faster growth in the wages of more educated workers than those of their less-skilled counterparts.

Figure 3

Changes in mean income estimation by income quintiles, %



Source: Tax Policy Center; Household Income Quintile

Another reason behind the constant increase in inequality can be found in the gradual erosion of workers' wage bargaining power due to globalization and the opening of international borders.

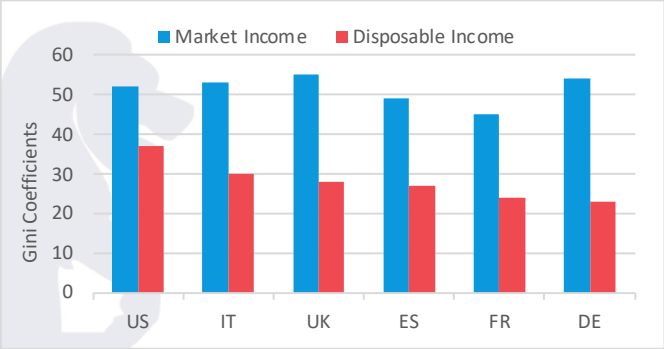
The idea that governments should implement policies directed at limiting social inequality is widely diffused. So, the question is, how can governments mitigate the effects of the structural trends on inequality?

The answer lies in the implementation of a range of policies and programs such as inclusive education policies, income/wealth taxes and transfers, and large-scale national job retention programs. For example, governments' direct taxes and transfers contribute to a reduction of Gini coefficients (a Gini coefficient of 0 indicates perfect equality while a Gini coefficient of 1 reflects maximum inequality) (*Figure 4*).

It is worth noting that in European countries, the level of income redistribution through tax and transfers conducted by the government is significantly higher than that in the US.

Figure 4

Reduction of Gini coefficients through governments' direct taxes and transfers



Source: Monetary Policy and Inequality; Dossche, Slačálek, & Wolswijk; (2021, February)

Note: market income equals income before tax and transfers, while disposable income signifies income after tax and transfers available for spending and saving.

Monetary Policy and Income Inequality

The effects of monetary policy on inequality are less obvious. To determine how monetary policy impacts inequality through income, we first need to introduce the mechanisms that affect labor market equilibriums in the economy.

When central banks enact expansionary monetary policy, thereby reducing interest rates across the economy, they spur aggregate demand and decrease unemployment. This leads to a rise in wages through two distinct avenues. Firstly, the resultant levels of reduced unemployment introduce new labor into the economy and provide the first dimension of increased worker income. This dimension is comprised almost entirely of unskilled workers whose labor and work opportunities are significantly exposed to business and macroeconomic cycles. The second dimension raises wages through tight labor markets which provide workers with increased bargaining power and impact skilled and unskilled workers alike.

However, the overall gains caused by expansionary monetary policy are unlikely to be distributed equally as lower-income households are far more exposed to both business cycles and monetary policy-induced shifts compared to their wealthier counterparts. (Guvenen et al., 2014). As a result, loose monetary policy mitigates income inequality within the economy, meanwhile contractionary monetary policy can be expected to have an opposite effect. As evidenced by the 1979-1983 recession data, income losses for low-income households were much more significant than those of high-income households.

To provide a more holistic understanding of how monetary policy impacts inequality through the income channel, we can apply the direct measure by analyzing the resultant consumption levels across the economy.

One way to classify the various households to determine income inequality is according to the amount of liquid assets held (Dossche et al., 2021). What differentiates the categories is their marginal propensity to consume (MPC) which represents the change in consumer spending resulted from a change in disposable income. According to this categorization, we find: "hand-to-mouth" households which are characterized by very few liquid assets and by a large MPC which means that they tend to consume all their income.

Moreover, this category could be divided into "poor hand-to-mouth" and "rich hand-to-mouth", with the latter that present positive illiquid wealth but very limited assets and large spending commitments.

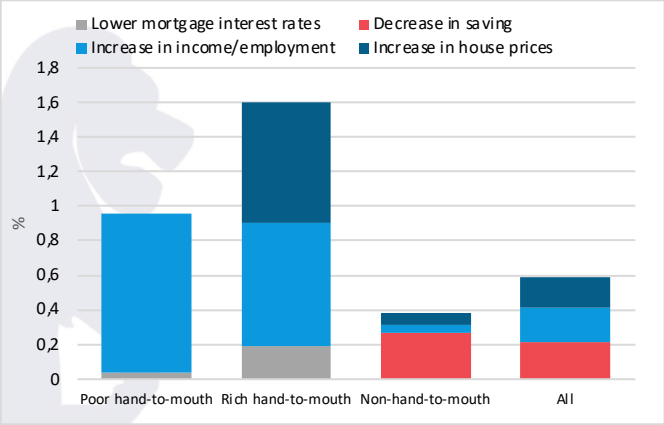
From the "hand-to-mouth" category we distinguish the "non-hand-to-mouth" category in which people tend to behave in line with the permanent income hypothesis since they do not show changes in response to a transitory increase in income, meaning that they can smooth their consumption over time and are not as responsive to immediate changes in income. In the Euro area 10% of households are considered "poor-hand-to-mouth", 12% "rich-hand-to-mouth" and the remaining 78% "non-hand-to-mouth".

Recent research (*Figure 5*) shows that a 100-basis point (1%) cut in real interest rates results in an approximately 1% increase in consumption for poor-hand-to-mouth households likely due to increased affordability of credit or loans, and a 1.6% increase in consumption for wealth-hand-to-mouth households. Consumption for non-hand-to-mouth households, on the other hand, increases only by 0.5% which emphasizes that non-hand-to-mouth households do not significantly alter their consumption behaviors following a temporary shift in interest rates.

The analysis is representative for one of the effects that follow an expansionary monetary policy. But what are the overall impacts on income resulting from such monetary policy? Several economic effects could be listed, and among these we find: lower interest rates which result in an increase of labor income and in the spending of low-income households. Another effect is certainly a higher inflation rate which is translated into a lower value of debts for low-income households and a lower value of assets for rich households.

Figure 5

Estimated impact on consumption of a 100-basis point cut in real interest rates in the euro area, %



Source: Monetary Policy and Inequality; Dossche, Slačálek, & Wolswijk; (2021, February)

Furthermore, there is a noticeable effect on mortgages, with empirical evidence showing that a "1% change in the federal fund rate typically translates to roughly a 0.5 pp change in the 30-year mortgage" (Mckay A., Wolf C., 2023).

Monetary Policy and Wealth Inequality

Central banks' monetary policies influence economic inequality through another important "distributional channel", namely, wealth. Wealth inequality refers to the uneven distribution of assets (taking liabilities into account) among households or individuals.

Focusing on the most recent historic developments, it is possible to notice how income and wealth inequality have increased measurably since the 1980s in many advanced economies, both in the euro area and in the US. Specifically considering the Euro area, one of the latest Euro system Household Finance and Consumption Survey (2017) provides us with evidence on how "the bottom 40% of the euro area households held only 3% of total assets, while the upper 10% owned nearly half of total assets" (Schnabel I., 2021).

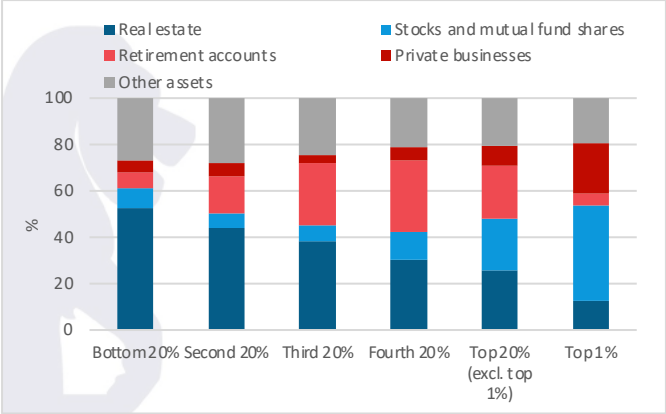
Different wealth composition (*Figure 6*) across different income quantiles' households implies heterogeneous effects caused by the same monetary policy, eventually contributing to inequality. In fact, asset classes respond differently to interest rates movements. Therefore, households are exposed to differential consequences depending on the forms of wealth they hold.

Expansionary monetary policies, aimed at stimulating the real economy by lowering interest rates, mainly have the effect of increasing asset prices, mostly held by the highest income quantiles of the population. It is relevant to point out the disproportion between the quantity of financial assets owned by high quantiles households and those owned by the lowest ones (*Figure 7*).

In the United States, the top decile owned a staggering 70% of net personal wealth in 2019. This unbalanced distribution of the assets owned is at the basis of the side effects of an expansionary policy in the perspective of its impacts on wealth inequality.

Figure 6

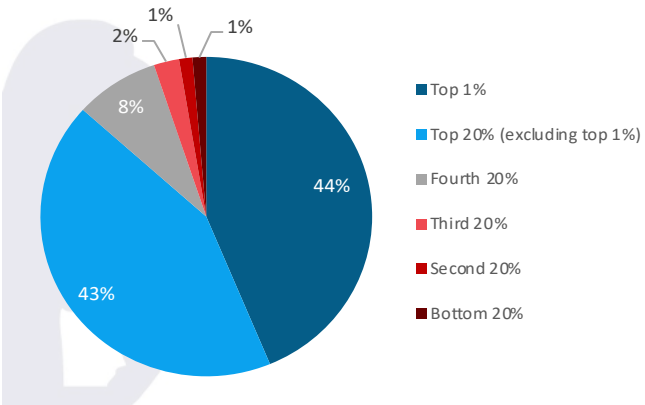
Wealth distribution by income quintiles



Source: Survey of consumer finances and Financial Accounts of the United States; Federal Reserve (2022, Q3)

Figure 7

Total stock equity and mutual funds shares across US income quintiles



Source: Survey of Consumer Finances and Financial Accounts of the United States; Federal Reserve (2022, Q3)

However, it is not totally correct to claim that the expansionary monetary policy ultimately favors most of the asset holders. Indeed, with reference to the so-called "unhedged interest rates exposures" (UREs), it has been shown that, when interest rates decrease, "agents whose financial wealth is primarily invested in short-term certificates of deposit tend to have positive UREs, while those with large long-term bond investments or adjustable-rate mortgage liabilities tend to have negative UREs" (Auclert A., 2016).

In this light, a drop in the real interest rate causes a redistribution from the first group toward the second group: the first one is generally represented by the medium-low quantiles' households, while the second one is traceable to the highest quantiles, who tend to have more long-term investments. In other words, the effects could be positive or negative depending on the different asset classes owned.

Effects of Monetary Policy on Asset Classes

Focusing now on expansionary monetary policies, we are going to analyze their effects on the main asset classes held heterogeneously across the population's quantiles.

Equities

Equity represents a typical component of higher quantiles' wealth: considering for example the United States scenario, approximately 85% of overall equities is owned by only the top 10% of all American households, grouped by percentiles of net worth ("Survey of Consumer Finances", Federal Reserve Board, 2021). This discrepancy becomes even more pronounced within the emerging economies.

Within an expansionary monetary policy, the generalized negative relationship between interest rates and stock prices results in capital gains that mostly benefit high-income households, raising wealth inequality. This is mainly explained by two effects: when interest rates go down, the present value of future cash flows increases, resulting in a higher stock price. Moreover, the stimulus given to the real economy normally leads to higher companies' earnings, with a reduction of financing costs, and therefore a second increase in dividends and stock prices. Domanski et al. (2016) argue that, on average, changes in equity prices have been a key driver of changes in wealth inequality in advanced countries since the start of the Global Financial Crisis.

Fixed-income Investments

The same is generally true for fixed-income investments, with a favored position for those with longer maturities, often held by high-income households. Bonds with longer maturities have higher durations which are more responsive to changes in interest rates. As a result, when expansionary monetary policy is enacted by the central bank, high-income households benefit from a sharp increase in price. While middle to low-income households are also sometimes invested in fixed-income instruments, it is far more unlikely that they would have the ability to incur the potential risk of having to hold the instrument to maturity. Instead, most low-income households tend to keep their wealth in liquid forms such as deposit accounts which are disadvantaged by lower interest rates.

Real Estate

Within "broader portfolios", real estate represents another crucial asset. Lower interest rates stimulate demand in the sector by reducing the cost of financing for homebuyers and investors, leading to higher house prices and increasing the value of real estate.

The effects on inequality depend on the homeownership distribution. These increased prices could be an equalizing factor if homeownership is broadly distributed amongst the population or can escalate wealth inequality if instead homeownership is concentrated among the top wealth holders.

Empirically, homeownership is justly distributed among the main developed economies, such as the United States (66%), Europe (70%) and Australia (66.3%), with certain outliers (like Italy, Portugal, and Spain within Europe, with higher rates). On the other hand, many developing countries, have a more broadly distributed homeownership (such is the case in Eastern Europe and some Eastern Asian countries, with rates frequently ranging from 80% to 95%) (World Bank, 2021).

Higher house prices have a strong effect on reducing wealth inequality as it benefits a larger group of households. The distribution of home ownership is more balanced, and the middle- and upper-middle-class benefit the most from the rise in house prices, as observed by Adam and Tzamourani in 2016 for the Euro area. Since this demographic constitutes a significant portion of the population, an increase in house prices has the potential to decrease wealth inequality.

Generally speaking, "by raising financial asset prices, a fall in the interest rate affects balance sheets of households through differences in the composition of their portfolio of assets" (Coibion et al., 2017; Inui et al., 2017). In this view, it would be appropriate to rebalance one's portfolio according to the expected changes in interest rates. Within an expansionary monetary policy, for example, it tends to be convenient to own stocks and long-maturity bonds, even considering diverse risk-aversions and preferences.

Household Debt

Also, a relatively important element is represented by households' credit and debt conditions. Within an expansionary monetary policy borrowers' condition is better off, considering the reduction of interest

payments on debt. On the other side, creditors will see lower returns on the money lent (and savers will see lower returns on their deposits). The opposite happens within a restrictive monetary policy. This effect tends to move in the opposite direction of that which occurs through main asset prices, thereby often scaling back the overall redistribution. (Ampudia et al., 2018)

However, with reference to savings again, within a monetary policy also the unexpected inflation rate represents in an indirect way a channel that affects inequality, by causing revaluations of nominal balance sheets, with creditors losing and debtors gaining.

Broadly speaking, younger, indebted households tend to benefit from an unexpected hike in the inflation rate, while older savers tend to suffer from it. The opposite holds for surprise deflation. Nevertheless, these effects are quantitatively very small for single-digit changes in the price level (Auclert A., 2016).

It is possible to say that in most cases the effects manifested through the portfolio composition channel (regarding the increase in asset prices with an expansive monetary policy) influence inequality to a far greater extent than the latter presented.

So far, we have only considered the case of expansionary monetary policies, which is the most relevant within the theoretical papers dealing with the relationships between monetary policies and inequality. Concerning restrictive monetary policies, the situation is generally similar to what is explained above.

In particular, on the equity and fixed-income side, the scenario becomes benevolent: higher interest rates generally mean lower prices within the equity and bond market, this way reducing inequalities. The same for what concerns cash deposits, where the higher rates improve the situation of the lower quintiles, who usually have most of their wealth in a liquid form.

A different scenario emerges with regard to real estate: in this case a restrictive monetary policy is generally more negatively impactful on wealth inequality, as higher interest rates mean higher mortgage and financing costs, hurting low-income individuals with adjustable rates mortgages, or looking for a house to rent.

Unconventional Monetary Policies

Regarding unconventional monetary policies, increasingly relevant in recent times, the perspective is even more drastic. There are two reasons explaining why an unconventional monetary policy may have had larger than usual effects on wealth inequality.

First, the short end of the yield curve has been at zero and the long end has been compressed for a long time. This means larger and more persistent valuation effects on financial assets. Second, some unconventional policy measures have explicitly targeted asset prices. As a result, the distributional effects of recent policy actions have attracted the attention of the public, drawing central banks into the debate on inequality, as highlighted by several speeches by top monetary policymakers (Yellen (2015), Draghi (2015), Mersch (2014) and Haldane (2014)).

However, many studies argue that unconventional monetary policies have had negligible effects on wealth inequality if we consider the asset prices channel in the Euro area (Adam and Tzamourani, 2016; Lenza and Slačálek, 2018), USA (Bivens, 2015), UK (Bunn et al., 2018), and OECD countries (O'Farrell et al., 2016). All these papers, taking into consideration equity, bond, and house prices, report ambiguous overall effects explained by the offsetting distributional impacts through the different asset prices, with higher house prices tending to reduce wealth inequality and higher equity and bond prices tending to increase it.

In support of these conclusions, other studies (Casiraghi et al., 2018; Inui et al., 2017), considering the two distributional channels represented by portfolio composition and savings redistribution, find that their effects on wealth inequality cancel out. In fact, rich households benefit more from unconventional policy thanks to capital gains on financial assets (portfolio composition), but the net wealth of poor households improves as well due to lower liabilities (savings redistribution).

Monetary policy affects inequality through wealth and income, with altered interest rates and aggregate demand affecting asset prices and labor market equilibriums respectively.

To conclude, in today's conduction of monetary policies, income and wealth inequality are largely taken into consideration since they could represent huge constraints on the effects of the monetary policies discussed. So, it appears to be fundamental to take into consideration the differences in households' wealth composition, their income's sensitivity to economic cycles and their propensity to consume to design the most effective transmission method of monetary policy to influence economic activity and inflation.

Existing Research

Many research papers have already been dedicated to the empirical analysis of the connection between monetary policy and inequality. This interest may be caused by the fact that most of the developed countries experienced a rise in inequality over the past twenty years, despite economic growth and the attempts to regulate social policy regarding income redistribution. For example, if we look at the European countries, in the last twenty years Gini index grew in such large and well-developed economies as Germany (9.3% increase), Sweden (6.3% increase), and Spain (3.3% increase). This increasing inequality leads to such undesirable consequences as constraining consumers' consumption and active investing.

From a theoretical perspective, monetary policy must have a significant effect on inequality, however, empirical studies show mixed conclusions regarding their connection. Some research papers prove that contractionary monetary policy increased income inequality in the US (Coibion, Gorodnichenko, Kueng, & Silvia, 2017) and the UK (Mumtaz & Theophilopoulou, 2017).

Ample research on the effects of monetary shocks conducted by IMF for 32 countries for fifty fifty-year period proved the same result with the effect on inequality being larger for positive shocks (Furceri, Loungani, & Zdzienicka, 2018).

However, other studies report the opposite results for Japan (Inui, Sudou, & Yamada., 2017) and the UK (Cloyne, Ferreira, & Surico., 2020) with both relying on the survey data rather than macroeconomic data. The latter also implied that loose monetary policy improves the lot of middle-income households the most, which means the 'inverted-U-shape' response of consumption to lower interest rates along the income distribution. Nevertheless, research on the US showed the opposite conclusion of "U-shape" response with both income and wealth of the poorest and wealthiest increase the most when monetary policy is loose (Albert & Gómez-Fernández, 2022). Same is proven to hold for the Swedish economy as well (Amberg, Jansson, Klein, & Picco, 2022).

Moreover, some of the researchers conclude that there is no evidence for the connection between monetary policy and inequality. For instance, the research in 24 developed and 66 developing countries conducted by Siami-Namini and Hudson over 25 years data showed that there is no direct relation between inflation and income inequality in developed economies, so inflation cannot act as a proxy of monetary policy, but this connection holds in the least developed countries (Siami-Namini & Hudson, 2019). Even further, Bank for International Settlements conducted research on the connection of inequity with monetary policy, globalization, and technological innovations and concluded that only the last two play a significant role in inequality's change (Bank for International Settlements, 2021).

To sum up, empirical results show different trends and even their absence, which theoretically can be explained by picking different variables as a proxy of monetary policy and different results from direct/indirect effects of monetary policy shocks. Thus, the question of the right approach to analyzing the connection between monetary policy and inequality remains open. Finding a solution can be beneficial to address social distribution issues and to improve constants for the economies' growth.

Prospects for Future Research

Determining any evident connections between the execution of monetary policy and social inequality still remains an attractive area for research.

The links between monetary policies and social inequality are not evident and thus, do not appear easy to quantify. The main limitation when attempting to quantitatively assess the nature of the relationship is the fact that monetary policy is an indirect factor when it comes to inequality. And so, there still is a lack of a structured approach to understand the (marginal) impact of monetary policy on inequality.

Moreover, inequality seems a multifaceted construct influenced to a large extent by various underlying factors. There are geopolitical (and similar exogenous) variables which are statistically difficult to quantify. Thus, it might be difficult to determine the exact extent to which the inequality levels are influenced by the monetary policy specifically.

Surely, the overall gains caused by expansionary monetary policy are unlikely to be distributed equally as lower-income households are far more exposed to both business cycles and monetary policy-induced shifts compared to their wealthier counterparts. (Guvenen et al., 2014). However, the absence of consensus on this matter in previous research underlines a present need to take a more holistic and comparative approach in statistical studies.

To further develop the topic of this paper, a first thing to do would be to find variables that capture the phenomenon of inequality in a full and exhaustive manner. Alternatively, another solution would be to

define a single variable (factor) that would unite together several indicators that describe inequality.

Another aspect that requires attention is a list of countries for consideration. Further developments on the topic could also include analysing the connection between monetary policy and inequality in a broader list of countries, especially those, where inequality is either more pronounced or, on the contrary, very low. In this regard, however, one of the possible problems that would be encountered is the difficulty in finding country-specific data corresponding to a sufficient time horizon.

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