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Federal Reserve Anti-Inflation Policy: Wealth Protection for the 1%?

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FEDERAL RESERVE ANTI-INFLATION POLICY: WEALTH PROTECTION FOR THE 1%?

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ABSTRACT

The Federal Reserve has a dual mandate from Congress that directs it to conduct monetary policy as such to achieve "maximum employment" and "stable prices." Yet the U.S. central bank typically chooses to address inflation as a top priority and focuses on employment only secondarily, if at all. Why? In this paper we argue that an important reason is that the Federal Reserve conducts policy so as protect the real wealth of the top 1% of the wealth distribution. We focus on the Fed's fight against inflation in 2021-2022, when it rapidly raised its policy interest rates by almost 4 percentage points in the face of more than 6 percent inflation. Using a novel econometric analysis, we provide evidence that shows that this policy serves as a real net wealth protection policy for the 1% by restoring some of the lost wealth that they would otherwise lose due to unexpected inflation. The results of this policy for the top 10% of the wealth distribution are econometrically ambiguous. But to the extent that the Fed's high interest rates generate higher unemployment or even a recession, this wealth protection for the 1% could have serious income costs for workers who find themselves or another member of their household out of a job.

Keywords: Inflation; Wealth distribution; Monetary policy; Interest rates.

JEL Codes: E52; E58; E60

1. INTRODUCTION

1.1 Inflation, Wealth, and the Political Economy of Federal Reserve Monetary Policy

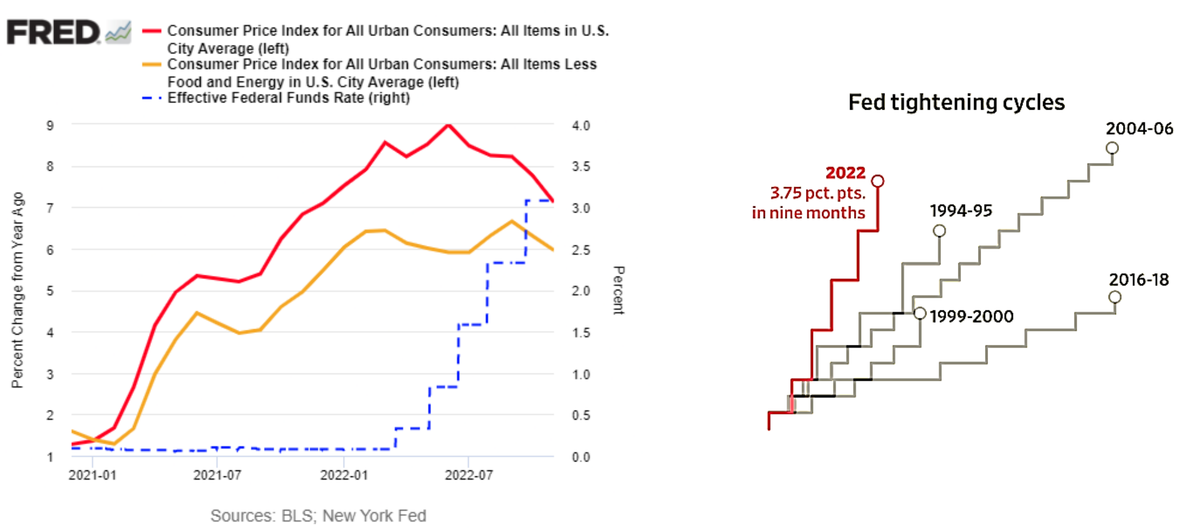
The Federal Reserve (the Fed) has been given a dual mandate from Congress, identifying the key goals it should try to achieve with its monetary policy (Binder & Spindel, 2017). The Federal Reserve Act mandates that the central bank conduct monetary policy "so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates" (BGFRS, 2021). However, the Fed has been and remains primarily focused on keeping inflation extremely low—for the last decade or more at a 2 percent target—no matter the costs for the labor market and economic growth (Pollin & Bouazza, 2022).

Why does the Fed typically ignore its maximum employment mandate when inflation exceeds 2 percent? The current fight against inflation and the Fed's approach to fighting it place this question in high relief. The CPI inflation rate from 2021 through early 2022 was over 7 percent annually. The Fed has said that it will do whatever it takes to reduce annual inflation to 2 percent, even if it must induce a recession to make it happen (Powell, 2022). It has already raised the Federal Funds rate, its primary policy tool, by more than 3.5 percentage points (Figure 1). Moreover, Fed officials have projected that they will need to raise the policy rate by at least another percentage point in 2023 (BGFRS, 2022). Unemployment is bound to increase significantly if the Fed continues to raise interest rates in this manner.

Figure 1 shows the 7 percent increase in prices in 2021 and the related 3.75 percent increase in the federal funds rate. This pace of interest rate increases is much steeper than we have seen in recent tightening cycles.

Fig. 1: Inflation and monetary policy tightening since the beginning of 2021

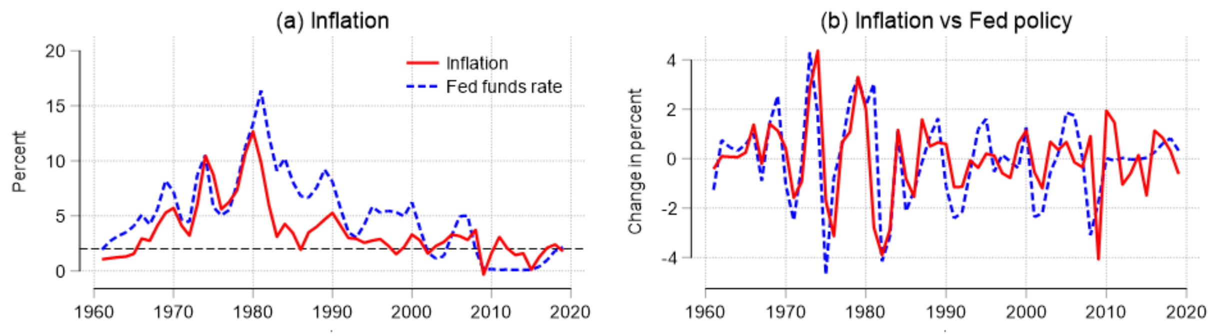
(a) Headline and core inflation vs policy rate | (b) Compared to past tightening cycles



Notes: (a) Period: Dec. 2020 - Nov. 2022. Inflation is defined on the left axis as the year-over-year percent change monthly. The effective federal funds rate is defined as a percent rate on the right axis. (b) Compares Fed policy rate tightening of the Federal Funds rate since the 1990s. The abbreviation pct. pts. refer to percentage points.

Source: (a) Federal Reserve Bank of St. Louis: FRED; (b) Sunderji, A. (2022, Nov. 1).

Fig. 2: U.S. inflation experience and monetary policy over the last six decades



Notes: Inflation is measured as the yearly average CPI inflation rate. Panel (a) is the level inflation rate and federal funds rate, the Fed's main policy target rate, while panel (b) is the change, or acceleration of the inflation, versus changes in the federal funds rate. In panel (a), the black-dashed reference line denotes the 2% inflation targeting regime of the Fed which has been an implicit goal of 1.5-2% since the 1990s and an explicit target of 2% since 2012.

Source: Federal Reserve Bank of St. Louis: FRED.

This pattern of policy rate tightening in the face of increasing inflation, with less concern about fulfilling its second mandate of maximum employment, is a typical postwar pattern. Figure 2 illustrates the pattern of inflation and monetary policy stance over the past 60 years.

Panel (a) shows the well-known pattern of inflation in the U.S. over the last sixty years, with inflation spikes during oil price increases of the 1970s and extremely low inflation since the rise of international competition, largely from China and the Great Financial Crisis of 2007-2008. Panel (b) illustrates the tight relationship between increases in inflation rates and tightening monetary policy through increases in the Federal Funds rate.

This paper explores why the Fed officials pursue this 'inflation-obsessed' policy. We argue that the central goal of Fed monetary policy is to protect the real wealth of the richest Americans, the "top 1%" (or higher) of the wealth distribution. This goal reflects the interests of the central bank's primary constituency: mega financiers and the owners of the major non-financial corporations (Epstein, 2019, 2023). This focus often places Fed policy in direct tension with the interests of workers and the bottom half of the wealth distribution.

Historical narratives are replete with evidence that the Federal Reserve tends to see the world through "finance colored" glasses (D'Arista, 1994; Greider, 1989; Jacobs & King, 2016). In addition, there is substantial econometric evidence that Federal Reserve monetary policy at various times has enhanced the incomes of finance and other capitalists. (See, for example, Coibion et al. (2017), Epstein and Ferguson (1984), in Epstein (2019), Ch. 6, Epstein and Schor (1990), in Epstein (2019), Ch. 7, Montecino and Epstein, in Epstein, (2019), Ch. 18-20.)

While plenty of rhetorical and theoretical attention has been paid to the relationship between inflation, wealth distribution, and macroeconomic policy, including central bank policy, empirical studies of the interactions are few. In the *General Theory* and elsewhere, John Maynard Keynes railed against the Bank of England for its excessive interest rates based on its focus on the needs of the City of London in opposition to the goal of full employment (Keynes, 1936; Crotty, 2019). Michal Kalecki also noted the "rentier interests" that oppose inflation in his famous article on the "political aspects of full employment" (Kalecki, 1971).

This paper explores the hypothesis that the Fed's current anti-inflationary monetary policy can be explained as a wealth protection device for the top 1%. Our econometric approach uses unexpected inflation and monetary policy changes to estimate the impact of inflation shocks and tight monetary policy on real net wealth—holding other key macro variables constant. We consider inflation and monetary policy shocks of the magnitude we have seen in the 2021-2022 period on real net wealth and its distribution.[1]

Our results are quite robust. They show that in the face of unexpectedly high inflation, such as the U.S. economy experienced in 2021-2022, sizeable contractionary monetary policy increases the real wealth of the top 1% compared with what their wealth would have been had the Fed taken no restrictive action. There is some evidence that the top 10% also benefited, though this result is not as robust. Meanwhile, the Fed's contractionary policy had no statistically significant impact on the real wealth of the bottom half.

This evidence supports the idea that the Fed policy of large interest rate increases in the face of high inflation serves as a wealth protection device for the top 1%. This wealth protection for the 1% also has costs for others. Specifically, we know that high-interest rates--by raising unemployment--worsen the income prospects for most workers. In fact, the negative impact on workers of the Fed's tightening is likely to be larger in the context of the current inflation, which is primarily supply-side induced (Banerjee & Bivens, 2022; Jarsulic, 2022; Ferguson & Storm, 2022). Supply-side generated inflation is likely to require a monetary policy that is tighter for longer to deliver the requisite reduction in inflation than would demand-driven inflation. Therefore, workers will bear the brunt of an induced recession by Fed policy.

Note, however, that we are not claiming that inflation is immaterial to the bottom 50%. The impact of inflation reduction on the real incomes of the poorest members of society, including those who work in sectors with little real wage protection, such as care workers, is unclear and worthy of further study (Folbre, 2022). Our results here focus on real wealth impacts, with most attention given to the top 1% and 10% of the wealth distribution.

1.2 Outline of the paper

The rest of our paper is organized as follows. The next section presents some stylized facts on the relationship between inflation, real wealth, and monetary policy. We then introduce our data sources and econometric approach. Following these preliminaries, we present our findings. We end with some qualifications of these results and a discussion of the implications of the results.

[1] Methodologically, our approach is similar to Bartscher et al. (2021). As they do, we estimate the effects of inflation and monetary policy using an instrumental variable local projections approach to account for endogeneity concerns. However, our approach differs in that we estimate the effect of inflation and monetary policy shocks on direct measures of real net wealth and distributional statistics, which resemble the work done by Coibion et al. (2017), Furceri et al. (2017) and Heraddi et al. (2020) for income measures, though, rather than wealth which we focus on here. Our results on the dynamic effects of inflation on wealth are in keeping with those of Doepke and Schneider (2006), who also study the U.S. case concerning inflation; however, the authors do not consider monetary policy effects, which are a focus of our work.

2. INFLATION, REAL WEALTH, AND INEQUALITY

2.1 Analytical preliminaries

Some straightforward economic reasoning can identify the likely channels of the impact of inflation and monetary policy on net wealth distribution. Here are some key channels of the impact of inflation and restrictive monetary policy on real net wealth: Unexpected inflation tends to diminish the real values of assets and liabilities. On balance, through this channel, net debtors benefit from unexpected inflation while creditors lose. Households' savings rate declines as incomes become constrained when real wages do not keep up with inflation; this would reduce wealth accumulation, especially by middle- and lower-income households. In this context, restrictive monetary policy has various impacts. Unexpected increases in interest rates decrease the market value of longer-term securities, redistributing wealth from households with unhedged long-term exposure--e.g., bonds and adjustable-rate liabilities--toward those primarily with short-term exposure--e.g., deposits and treasury bills, and fixed-rate liabilities.

In sum, higher inflation erodes the real wealth of creditors, and tight monetary policy has mixed impacts on the wealth of the rich: it lowers nominal asset values but may preserve the real value of wealth. Increased debt service burdens and increased cost of credit for continued consumption can lead income-constrained households to sell asset sales or increase borrowing, thereby reducing real net wealth.

The net effect on wealth distribution of unexpected inflation combined with monetary tightening is thus an empirical question, one which we address in this paper.

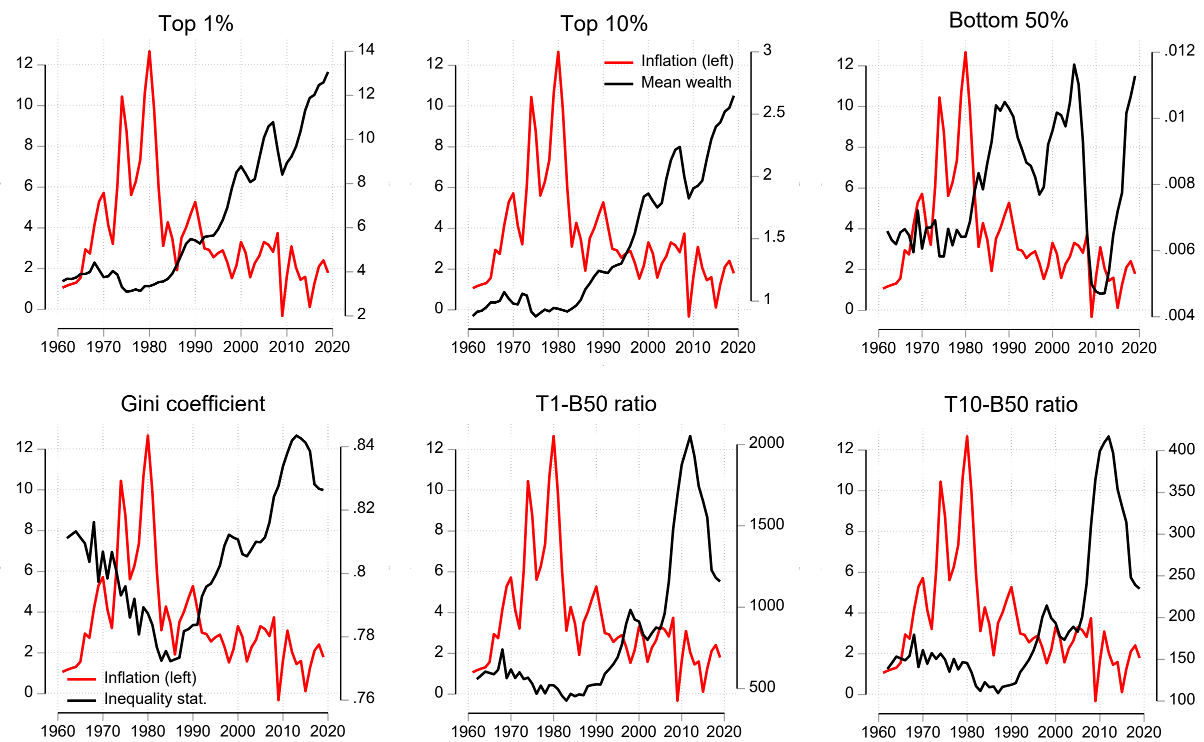
2.2 Existing Literature and Stylized Facts

The existing literature studying the intersection of wealth and inflation is limited. In a comprehensive survey conducted by Colciago et al. (2019), only three studies analyzed the effect on wealth through the inflation channel. Even among this small set of studies, there is no consensus on the relationship between inflation, wealth, and inequality. In lieu of a consensus, we examine descriptive data on these relationships.

2.2.1 Stylized Facts on the relationship between inflation, wealth, and wealth inequality for the U.S.

Figure 3 plots inflation against the evolution of real mean net wealth by class in the top row and wealth distributional statistics, including the Gini coefficient and wealth ratios, in the bottom row. What stands out is that the high inflation of the 1970s is associated with an erosion of real wealth at the top 1% and 10% of the distribution. By contrast, during the low inflation environment from the 1980s onward, the real wealth of the 1% and 10% have increased substantially. In contrast, the bottom half (B50) has generally stagnated, taking a substantial fall after the 2008 financial crisis and subsequent recession. In terms of distributional statistics, in the bottom row of Figure 3, there is a clearer negative correlation between inflation and wealth inequality. Between 1960 and 1985, wealth inequality, as broadly measured by the Gini Index, fell from 0.81 to about 0.77 in this higher period of inflation and then reversed to rise precipitously to over 0.84 in the subsequent era of lower inflation. The same story holds with respect to wealth ratios.

Fig. 3: Inflation, wealth and its distribution



Notes: The red line denotes the inflation rate in all the graphs. T1, T10, and B50 refer to the top 1%, top 10%, and bottom half of the wealth distribution, respectively. For each panel, inflation is measured on the left axis as the annual percent change in CPI. In the top row, mean wealth is measured on the right axis in millions of 2019 adjusted dollars. In the bottom panel, inequality stat. denotes the distributional statistic for which the graph is titled above and is measured on the right axis in its respective units. The Gini coefficient, or Gini index, is measured on a scale of 0 to 1, 1 being the most unequal.

These apparent relationships raise the key question of our paper: To what extent is the relative growth in real wealth of the top end of the distribution been generated, at least in part, by Fed policy toward inflation?

3. Data

In this section, we elaborate on the sources and characteristics of the data used in the analysis. Our period of observations is narrowly focused on the post-war United States between 1969 and 2012. Beyond this period, we are constrained due to data availability of instrumental variables measures and some macroeconomic variables. Our main goal with data choices is to maximize the available observations that would capture the 1970s Great Inflation as it is the most relevant period to inform our present experience. To be relevant, it is important that our estimates reflect this period as much as the "Great Moderation" period of low inflation from the 1980s onward.

3.1 Measures of wealth and inequality

We obtain wealth data from the World Inequality Database (WID), which has built on the work of Piketty (2001, 2003) and Piketty and Saez (2003) and their World Top Incomes

Database (WTID) and has since been subsumed into the WID project as of 2015. As pioneers of the Distributional National Accounts (DNA) methodology, WID attempts to harmonize the system of national accounts with micro survey and tax data to produce a consistent annual time series of income and wealth aggregates and distributional statistics across a board set of countries (Blanchet et al., 2021).

Our main dependent variables of interest are the mean net wealth of the top 1% (T1) and top 10% (T10), as well as the bottom half (B50) of the distribution. We also examine distributional statistics, including the Gini coefficient and wealth ratios of the T1-to-B50 and T10-to-B50.

Net wealth is defined in the WID as financial plus non-financial assets minus liabilities. Real values are adjusted to 2019 dollars using the Consumer Price Index (CPI) from the Bureau of Labor Statistics, obtained from the Federal Reserve Economic Database (FRED).

3.2 WID data versus other wealth measures

The advantage of WID data is that it provides the longest consistent annual times series of wealth that would permit this type of analysis. Other data series do not compare on this dimension. For example, the Fed's Distributional Financial Accounts data only goes back to 1989, which excludes the 1970s Great Inflation period.[2,3] And survey measures of wealth for the United States, such as the SCF, contain significant gaps between surveys or, as in the case of the Survey of Income and Program Participation (SIPP), have only recently started to measure wealth on an annual basis in the last few years.

It is also worth acknowledging that measuring the distribution of income and wealth is challenging, and statisticians and economists continue to develop and debate appropriate methods. Naturally, there are discrepancies between wealth measures due to methodological choices and inherent measurement errors. Figure 4 provides a comparison between WID data, SCF+ data from Kuhn et al. (2020), which harmonizes the triennial surveys conducted by the Fed since 1983 with older surveys of the SCF commissioned between 1947 and 1977, as well as measures from tax data estimated by Saez and Zucman (2016). These are the longest-running wealth measures available to date that provide a sense of the historical evolution of wealth inequality. What is important to notice is that although there are discrepancies in the levels of inequality, all three measures in Figure 4 indicate the same basic trends in wealth inequality over the last half century: wealth inequality declined between the 1960s and 1970s but has been rising precipitously since 1980. For our purposes, this is important as we want to estimate the dynamic relationship between these trends for inflation and monetary policy. As long as the trends are relatively the same, any measurement error associated with any one measure is likely to be small on average.

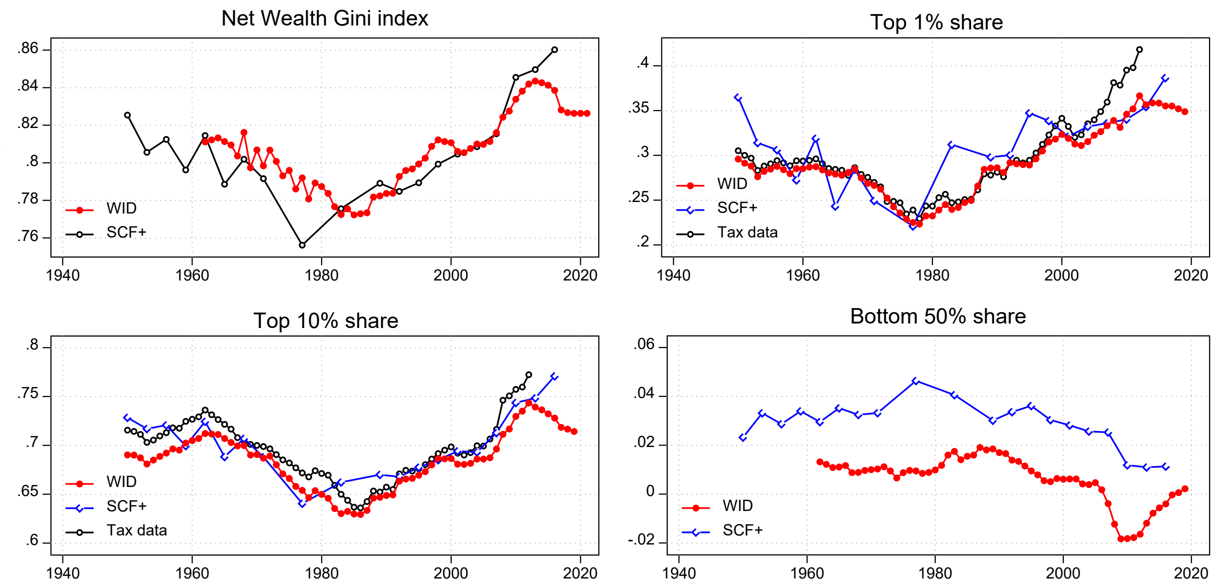
3.3 Monetary Policy Shock Variable

Our analysis of monetary policy relies on measures of "unexpected" monetary policy. A detailed discussion of our measures of this variable is provided in section 4.3 below.

[2] For comparison, the data is available at https://www.federalreserve.gov/releases/z1/dataviz/dfa.

[3] DFA does, however, offer a breakdown of different asset classes; this could be important for future research as some assets or liabilities may respond differently to inflation and interest rate changes. Our thanks to Michael Ash for pointing this out.

Fig. 4: Comparison of wealth measures



Notes: WID = World Inequality Database. SCF+ = Survey of Consumer Finances plus obtained from Kuhn et al. (2020). Tax data is from Saez & Zucman (2016); also obtained from Kuhn et al.; not available for bottom 50% share.

3.4 Macroeconomic Control Variables

Table A1 in the Appendix summarizes the additional macro variables we use in our analysis as controls and to construct alternative instrumental variables for inflation in later analysis. Inflation is calculated by taking the change in the log of CPI and multiplying it by 100. GDP growth is also calculated this way. The Wilshire 5000 Index was chosen over the S&P 500 as it captures a larger share of the public equity market. The FHFA transactions index was chosen over the Case-Shiller index because it goes back further in time; Case-Shiller began in 1987. However, results do not fundamentally change in either case.

4. Empirical Methodology

In this section, we discuss our methodology. Our empirical strategy accounts for the competing effects of inflation and monetary policy intervention on mean net wealth and its distribution. The general approach has two parts. First, we use the local projections method to estimate the dynamics effects of an unanticipated increase in inflation on measures of net wealth inequality and mean net wealth by class. Then we estimate the varying impact of inflation shocks conditional on Fed intervention with contractionary monetary policy and compare the outcomes. In the second part, we disaggregate the net effect by estimating each dynamic effect of monetary policy on inflation, inflation on wealth, and monetary policy on wealth to understand better the channels driving our results.

4.1 Instrument variable local projections

The local projections method developed by Jordà (2005b) is an increasingly popular alternative to vector autoregression (VAR) to compute impulse response functions (IRFs) which estimate the dynamic relationship between two variables over some time horizon. However, to address endogeneity issues concerning monetary policy and inflation, we use the recently developed instrumental variable local projections (LP-IV) approach following Jordà, Schularick, and Taylor (2020) and Bartscher et al. (2021).

Using instrumental variables in regression analysis is a common identification strategy to address problems of omitted variable bias--i.e., when the explanatory variable is correlated with the error term--and simultaneity and reverse causation between the outcome variable and explanatory variables. If these issues are present, ordinary least squares will produce biased and inconsistent estimates.

Stock and Watson (2018) formalize the econometric theory of identifying dynamic causal effects using "external instruments" within the local projections approach; *external* in the sense that "credible identification is obtained using as-if random variation in the shock of interest that is distinct from—external to—the macroeconomic shocks hitting the economy." In the study of monetary policy, for example, it is common to construct such instruments as partial measures of monetary shocks revealed during windows of monetary policy announcements.

Central bank officials who set monetary policy do so in response to macroeconomic conditions. In one of the most widely cited and used approaches in the literature, Romer and Romer (2004) attempt to address this endogeneity problem by regressing Fed officials' intended policy rate changes, identified from primary documents (e.g., FOMC meeting transcripts, etc., the so-called "narrative" approach), on the Fed's Green book (now the Teal book) projections of inflation, GDP, and unemployment, then extract the residuals.[4] These residuals, or "innovations" in econometric parlance, represent the "exogenous" component of policy rate changes. It is standard in the literature to estimate the effect of monetary policy using this measure directly in structural vector autoregression (SVAR) or local projections methods.

There are some problems with this approach. One is that measures of this kind typically contain measurement error and may lead to biased results when treated as the "true" shock. However, according to Stock and Watson, "that measurement error need not compromise the validity of the measure as an instrument" (2018, p. 918). To the extent such measures are exogenous, even if they only capture a partial aspect of the true shock, they are uncorrelated with the other shocks hitting the economy and, therefore, can be used as an instrument to identify the exogenous variation in the actual policy rate (ibid., p. 923). Using such shock measures in an instrumental variable set-up, therefore, is argued to produce a quasi-experimental design that aims to establish a cause-and-effect relationship between our independent variable, in this case, the changes in the policy rate, and an outcome variable of interest, and is a more credible identification strategy than the standard SVAR approach.

We first apply the standard LP-IV approach. Our innovation is to instrument both the policy rate and inflation rate in the same model using a two-step general method of moments (GMM) estimator.[5] The reason we instrument two variables is the following: both inflation and monetary policy are endogenous variables (Barro, 1996, 1997; Hineline, 2007). Moreover, the Hausman-

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[4] Other methods identify shocks of monetary policy by looking at high-frequency responses of fed funds futures contracts (e.g., Bernanke & Kuttner (2005), Gertler & Karadi (2015)).

[5] Allen, Galati, Moessner, and Nelson (2017) use a similar approach to address the endogeneity of two variables simultaneously: cross-currency basis swap spreads and the LIBOR-OIS spreads.

Wu test confirms it in practice. Therefore, we have little choice but to proceed cautiously to identify two endogenous variables, being careful to confirm that our estimates are not subject to weak identification problems. We then estimate cumulative impulse response functions (IRFs), which we use to graphically visualize the path of our dependent variables in response to unanticipated shocks to the inflation rate--i.e., in response to an acceleration of inflation--and the policy rate over the short to medium term, that is, up to 5 years after the shock.

Then, as a type of robustness check, we estimate these effects separately on each other using the LP-IV to see if we obtain similar results. First, we estimate the dynamic effects of contractionary monetary policy on inflation, then inflation on mean net wealth, and finally, contractionary monetary policy on mean net wealth. This deconstructed approach also helps us understand the underlying dynamics driving our main results.

4.2 Specification

The LP-IV specification takes the following form and is estimated in two-stages using a GMM estimator:

First stage:

$$r_t = bz_t + \delta x_t + \varepsilon_t \tag{1}$$

$$\pi_t = bz_t + \delta x_t + u_t \tag{2}$$

where $t = 1, \dots, T$.

Second stage:

$$y_{t+h} - y_t = \alpha_h + \beta_h \widehat{r_t} + \varphi_h \widehat{\pi_t} + \gamma_h X_t + v_{t+h}; \text{ for } h = 0,1, \dots, H-1. \tag{3}$$

In the first stage, r_t and $\pi_t$denote the policy rate and inflation rate, respectively, at time t. z_t is the vector of shock instrument variables and x_t is a vector of contemporaneous values of control variables to improve identification—including the unemployment rate, inflation rate, and GDP growth, and the 10-year treasury note yield—and X_t, in the second stage, is a vector of lags using those same variables, asset prices in equities and housing and includes four lags of the dependent variable and explanatory variables. And y_{t+h} is the measure of wealth or inequality at h periods after unanticipated change in inflation and or monetary policy. ε_t, u_t, and v_t are the respective error terms for each stage of estimation.

4.3 Instruments

For our main instrument used to identify the exogenous component of monetary policy changes, we use Romer and Romer's (2004) monetary policy shocks updated through 2012 by Breitenlechner (2018). The advantage of Romer-Romer shocks is that the measure goes back to 1969, whereas other measures date back only to the late 1980s (e.g., Gertler & Karadi (2015), Bernanke & Kuttner (2005)) or early 1990s (e.g., Bu, Rogers, & Wu (2019)); therefore, they miss a crucial period of U.S. historical experience of elevated inflation, the 1970s.

Identifying an appropriate instrument for inflation is difficult. Common past practice has been to use lag values of inflation (Hineline, 2007). However, according to Barro (1996), this can be problematic as past inflation would be correlated with the error term, i.e., creating omitted variable bias. However, this problem can be attenuated with additional control variables (Barro, 1996, p. 11).[6]

Therefore, we proceed first by estimating LP-IV with lag values of inflation as an instrument and then, as a robustness check, estimate with an inflation shock measure derived as the differential between the survey of consumers' inflation expectations and actual inflation to identify the exogenous component of inflation. Following the recommendation of Stock and Watson (2018), we include relevant contemporaneous control variables to improve identification (p. 925).

Our biggest concern is weak identification using these instruments, as weak correlation may produce biased parameter estimates and misleading inferences from standard errors. We rely on a diagnostic test developed by Stock and Watson (2005) to check that we do not have a weak identification problem.[7]

4.4 Scaling impulse shocks to simulate current inflation and policy tightening

One advantage of the LP approach is that it is easy to scale the size of impulses to explanatory variables. While typical IRF analysis would estimate a one standard deviation shock, as is often the case in VAR approaches, the LP method normalizes coefficient estimates to the unit of the impulse variable. Therefore, we can easily scale the shock to fit a particular policy scenario or event using scalar multiplication.[8] To inform our current moment, we look to the recent experience of inflation and the Fed policy tightening intervention since the onset of the covid-19 pandemic.

For the convenience of the reader, Figure 5 reproduces Figure 1 with some added annotation. Panel (a) plots the inflation rate, defined as the monthly year-over-year percent change in (headline) CPI and core-CPI, which excludes food and energy prices, for comparison, and the federal funds rate, the Fed's primary policy variable. Over the course of 2021, inflation increased from 1.35 to 7.5 percent, about a 6-percentage point acceleration. Compared with core inflation, we see a similar surge, rising from 1.38 to 6.04 percent over the same period; this indicates that underlying inflation is not primarily due to the more volatile food and energy components. In terms of professional forecasters, this was a wholly unanticipated surge. The Federal Reserve Bank of Cleveland forecast model put expected headline inflation at 1.4 percent. The average forecast by the Survey of Professional Forecasters put inflation at 2.22 percent for the year in the first quarter of 2021. The University of Michigan's household survey of inflation expectations was 3 percent; however, this survey tends to run systematically higher relative to professional forecasters and actual inflation.

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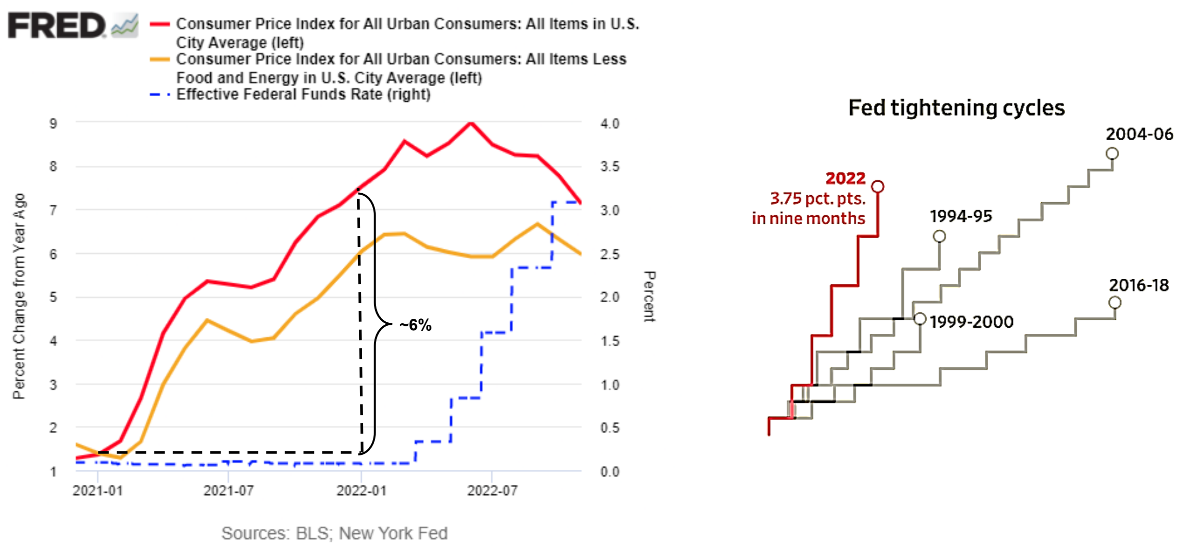
[6] Some alternative approaches derive inflation shocks as the difference between actual inflation and surveys of inflation expectations 1-year out, e.g., of households by the University of Michigan or of professional forecasters as conducted in the Survey of Professional Forecasters (SPF) by the Federal Reserve Bank of Philadelphia (Connelly & Stivers, 2022). The drawback of these measures, however, is data availability. The University of Michigan survey started in 1978 and forecast data of CPI began in 1981 in the SPF. Again, this excludes a central period observation we would want to preserve.

[7] We use the enhanced routine diagnostic capacities of the user-contributed `ivreg2` command in Stata developed by Baum et al. (2007) to obtain the test statistics and Stock-Yogo critical values.

[8] Note that this must be applied to the vector of standard errors and coefficients.

Fig. 5: Putting the current inflation and monetary policy tightening in context

(c) Headline and core inflation vs policy rate (d) Compared to past tightening cycles



Notes: (a) Inflation is defined on the left axis as the year-over-year percent change monthly. The effective federal funds rate is defined as a percent rate on the right axis. (b) pct. pts. = percentage points.

Source: (a) Federal Reserve Bank of St. Louis: FRED; (b) Sunderji, A. (2022, Nov. 1).

In terms of Fed intervention in response to inflation, Figure 5 (a) indicates a steep liftoff from the zero lower bound of nearly 400 basis points in the Federal Funds rate. Figure 5 (b) is taken from a recent article in *The Wall Street Journal* which informatively compares this tightening cycle relative to previous cycles since the 1990s. The figure illustrates that this is the most rapid tightening cycle in two decades.

Given the most recent shocks noted above, we scale our impulse shocks on inflation of 6 percent, then estimate the same impulse responses conditional on Fed contractionary policy intervention of 200 basis points and 375 basis points (or 3.75 percent) for comparison.[9]

5. Results

In this section, we first report the results of our LP-IV models using the double instrumental variable strategy explained in section 4. Then we discuss robustness checks using an alternative instrument for inflation. The figures for that exercise are provided in the Appendix. We then report the results of the estimated LP-IVs for the decomposition of individual effects.

5.1 Double instrument LP-IV model

5.1.1 Main results

Figures 6 and 7 present our main results for distributional statistics and real net wealth by class, respectively. For each figure, the top row shows the estimated impulse response function

[9] Note that even if we use smaller scalars of, say, a 3 percent shock to inflation and 100bp and 200bp shock to the policy rate, the conclusions do not change, just the scale of the effect on the dependent variables we examine.

of a 6 percent unanticipated shock to the inflation rate. The middle and bottom panels estimate the response functions for the same inflation shock with contemporaneous Fed contractionary policy intervention of 200 basis point (bp) and 375 bp rise in the policy rate, respectively.

As previously noted, we want to be careful to avoid weak identification. Table A2 in the Appendix reports the results of weak identification tests for each specification considered. Figures 6 and 7 correspond to specification (2), in which we include controls for asset prices on equities and housing but instrument inflation using lagged inflation values. See the notes for the rationale of these control choices.

Taking each figure in turn, Figure 6, column 1, looks at the effect of inflation shock on the Gini index, which ranges between 0 and 1, with 0 being the most equal and 1 being the most unequal distribution of wealth, and the ratios of the top 1% and 10% relative to the bottom half of the distribution. Our estimates indicate that a 6 percent inflation shock initially increases the Gini index but reduces inequality for all three measures over the medium term in the case of the Gini index and T1-B50 ratio, whereas the effect appears to dissipate for the T10-B50 ratio. When monetary policy also intervenes with a 200 bp unanticipated shock (see the blue line in the middle row panel) or an even more aggressive 375 bp shock (see the red line in the last row), the effect is not statistically significant from zero. We interpret statistical significance at the 10 percent level based on the gap between confidence bands. Overall, the combination of inflation after monetary policy may reduce inequality but does not appear to have a statistically significant impact.

Figure 7 presents estimated impulse responses for average real net wealth by class. An inflation shock of 6 percent reduces the net wealth of the top 1% and 10% but improves it for the bottom half of the wealth distribution. However, with contractionary policy intervention by the Fed of 200bp, the wealth at the top 1% does not decrease as much, effectively increasing their wealth relative to the top 10% and bottom 50%, for whom the policy intervention does not appear to make a statistically significant difference. If the Fed acts more aggressively by increasing the policy rate by 375 bp, the 1% does even better in the short term, two years after the shock, but in the long term, 4-5 years after the shock, the effect dissipates. The top 10% and bottom 50% still do not experience any statistically meaningful effect.

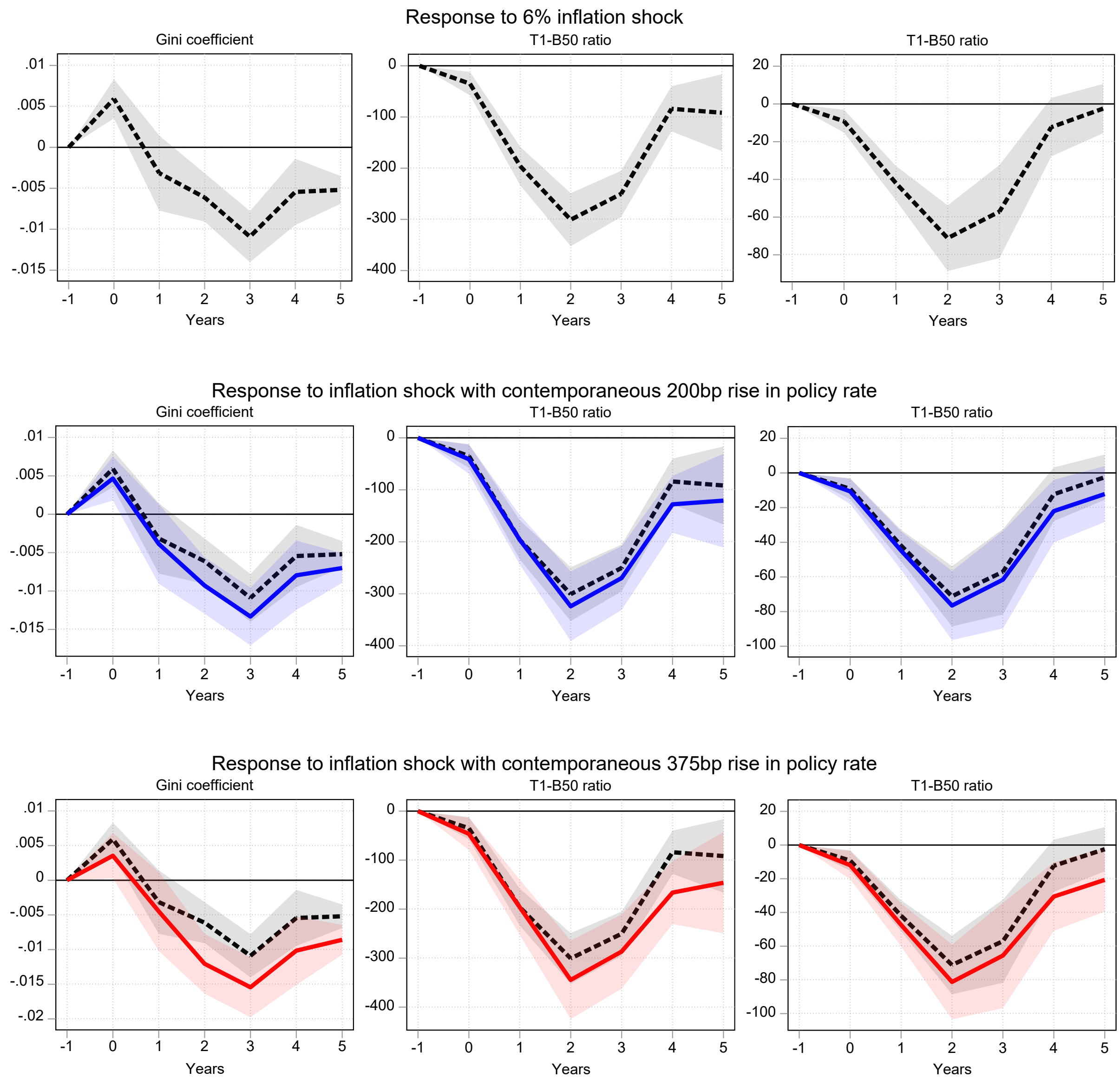
5.1.2 With an alternative inflation instrument

As a robustness test, we also use an alternative instrument for inflation based on consumers' expectations, as briefly described in section 4. The instrument performs well, as indicated in Table A2, column (3) of the Appendix, but becomes less reliable for the 1%'s mean wealth when asset prices are included as controls.

The results for the alternative instrument are reported in Figure A1 for the distributional statistics and Figure A2 for mean wealth by class. For this case, we use the same impulse scalars as before but obtain differing results.

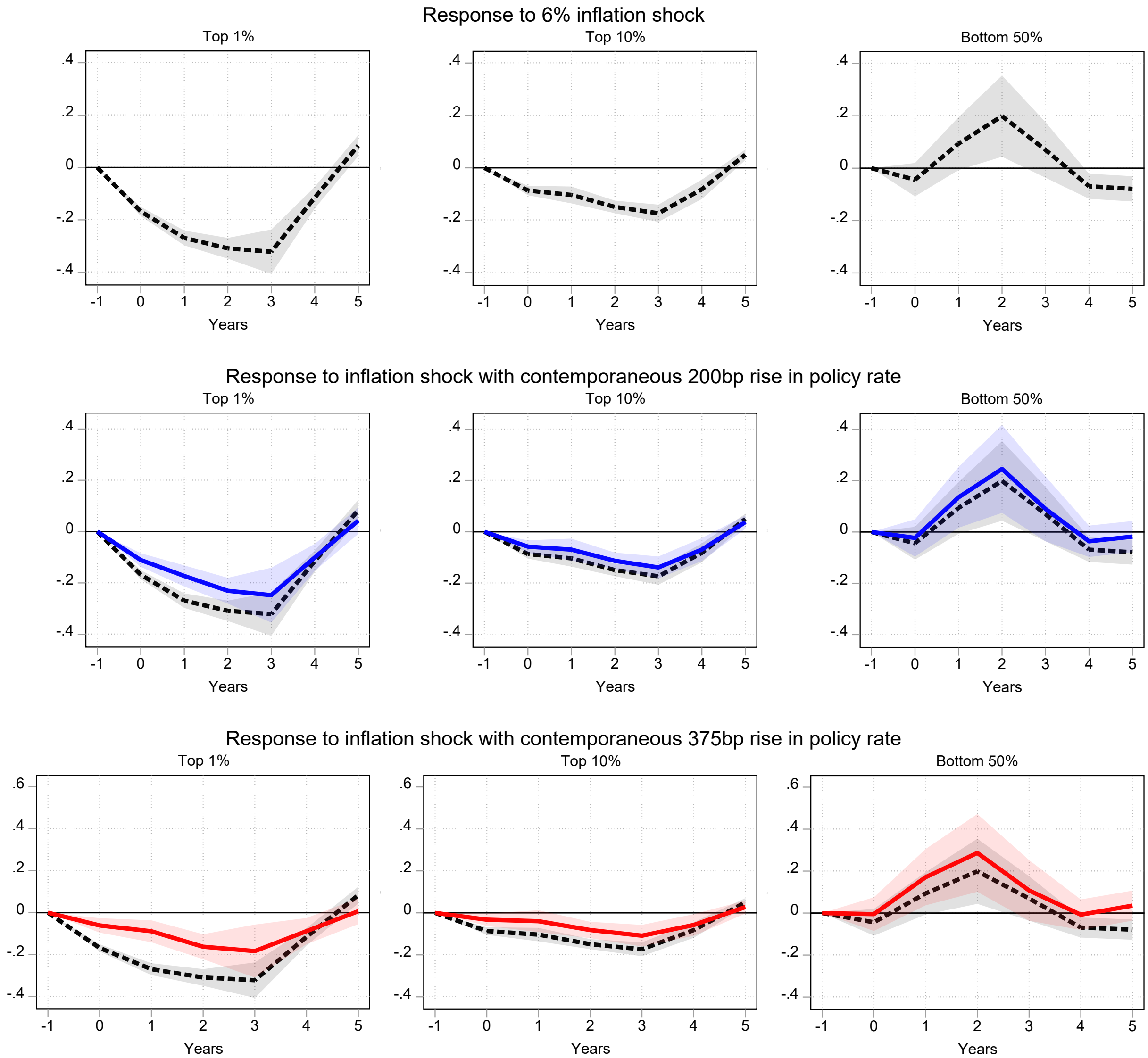
In the top row of Figure A1, we see a statistically significant negative decline in the Gini coefficient initially for a couple of years in response to inflation, then a statistically significant increase in years four and five after the shock. For the T1-B50 ratio, a 6 percent inflation shock induces an eventual rise in the wealth gap after four to five years. The T10-B50 ratio also rises but is not statistically significant. The other difference is that a more aggressive contractionary policy appears to reduce the Gini coefficient in the process of fighting inflation, but, this time,

Fig. 6: Estimated effects of inflation and contractionary monetary policy on wealth distribution



Notes: The figure shows cumulative impulse responses to the Gini index and wealth ratios of the top 1% and 10% relative to the bottom 50% (a measure of the wealth gap) in response to inflation and monetary policy shocks. The top panels show responses after a 6% unanticipated increase in the inflation rate only (black-dash line). The middle panels response to the 6% inflation shock with a simultaneous contractionary shock to the policy rate of 200 basis points (blue-solid line). And the bottom shows the responses after the 6% inflation shock combined with more aggressive contractionary policy of 375 basis point increase (red-solid line). Light shaded regions corresponding to the color of each line denote 10 percent confidence bands obtained from Newey-West robust standard errors. The time scale on the horizontal axis is measured in years. The vertical axis measures the cumulative change in each variable's respective units over the indicated time horizon. Point estimates of the impulse responses and the confidence intervals for this figure are provided in Table A3 of the Appendix.

Fig. 7: Estimated effects of inflation and contractionary monetary policy on log of mean real wealth by class



Notes: The figure shows cumulative impulse responses of log mean real net wealth for the top 1%, 10%, and bottom 50% after a 6% unanticipated increase in the inflation rate (top row), and a simultaneous unanticipated contractionary shock to the policy rate of 200 basis points (middle row, blue line) and 375 basis point increase (bottom row, red line). Light shaded regions corresponding to the color of each line denote 10% confidence bands obtained from Newey-West robust standard errors. The time scale on the horizontal axis is measured in years. The vertical axis measures the cumulative change in logscale which approximate percentage change in the value of the variable—0.2 or below—over the indicated time horizon. Point estimates of impulse responses and the confidence intervals of this figure are provided in Table A4 of the Appendix.

the effect is statistically significant in year two after the shock. Contractionary monetary policy does not make a statistically significant difference in any other case.

In Figure A2, we return to mean net wealth and find similar outcomes as the previous results. The biggest difference is that this estimate suggests a 6 percent inflation shock has a more sustained adverse effect on the wealth of the top 1% and 10% even five years after the shock. A contractionary monetary policy intervention of 200 bp does not make a significant difference. However, the more aggressive 375 bp increase in the policy rate does in the third and fourth years after the shock for the top 1%. Still, no statistically significant effect is found for the top 10% or bottom half of the distribution.

5.1.2 Discussion of the main result

In both models, we find a statistically significant effect from monetary policy reducing the adverse effects on wealth accumulation to the benefit of the top 1%. It appears contractionary monetary policy acts as a preservation mechanism against inflation which would otherwise erode the value of the wealth of the ultra-rich if left unchecked. The effect of the intervention on the top 10% and bottom 50% is ambiguous. The estimates indicate contractionary policy may also help the top 10% and even the bottom half, but the effect is not statistically significant.

5.2 Decomposition of dynamic effects on mean net wealth

In looking at the impact of inflation and tight monetary policy on real wealth, several forces pull in opposing directions to generate the net outcomes we see. On the one hand, increases in unexpected inflation lower the real wealth of creditors and raise the real wealth of net debtors. On the other hand, when the Fed increases nominal interest rates, it has two opposing impacts on net real wealth. The interest rate increase reduces the nominal value of financial assets owned mostly by the wealthy. By itself, this further erodes the real value of the creditors' net wealth. On the other hand, as the increased interest rates reduce the inflation rate, this increases the real net wealth of the creditors. The net impact depends on the size and timing of the inflation reduction impacts of the Fed's contractionary policy.

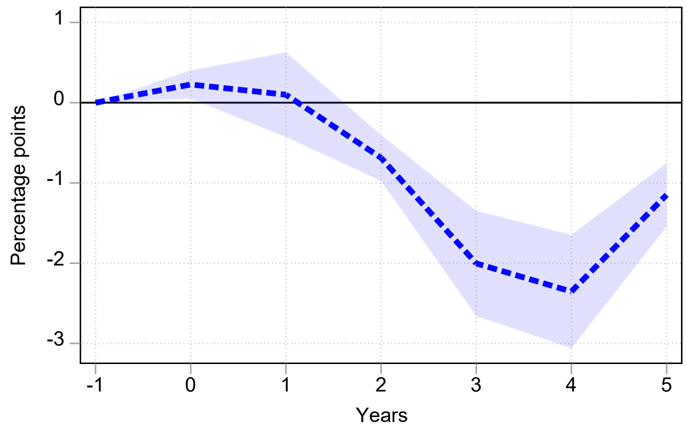
We can thus gain more insight into the forces driving our results by looking at the effects of inflation and monetary policy separately and then computing the net effects of these two factors. For this exercise, we also use LP-IV but using a single instrument, meaning we estimate only equation (1) or (2) in the first stage where appropriate. Then we combine the two results. In the end, we obtain similar results from this exercise as from the joint exercise we reported earlier, further validating our double instrument model presented above.

5.2.1 Monetary policy on inflation

First, we estimate the effect of monetary policy on inflation. Figure 8 reports the impulse response of inflation to a contractionary 100bps increase in the policy rate. The point estimates of the response are also reported in Table A5.

The cliché among central bankers—which may have originated with Milton Friedman (Culbertson, 1960)—is that monetary policy operates with "long and variable lags" on the economy. Figure 8 indicates that the lag is about one to two years to affect inflation. At the point of the initial shock, we see a small but positive and significant effect on inflation. This result is not uncommon in estimates of inflation in response to a contractionary policy which has presented a "puzzle" for mainstream researchers of monetary policy (Bernanke & Blinder, 1992; Sims, 1992; Balke & Emery, 1994). However, it is not surprising that firms attempt to price in

Fig. 8: Impulse response of inflation to 100 bp increase in the policy rate



Notes: This figure shows the response of the inflation rate, defined as the annual percent change in headline CPI for all urban consumers, to an unanticipated contractionary 100 bp increase of the policy rate. The only instrument used is Romer-Romer shock series on the policy rate. Controls include lags of the dependent variable and explanatory variable. The light-shaded region denotes 10 percent confidence bands obtained from Newey-West robust standard errors. The time scale on the horizontal axis is measured in years. The vertical axis measures the cumulative change in percentage points of the inflation rate.

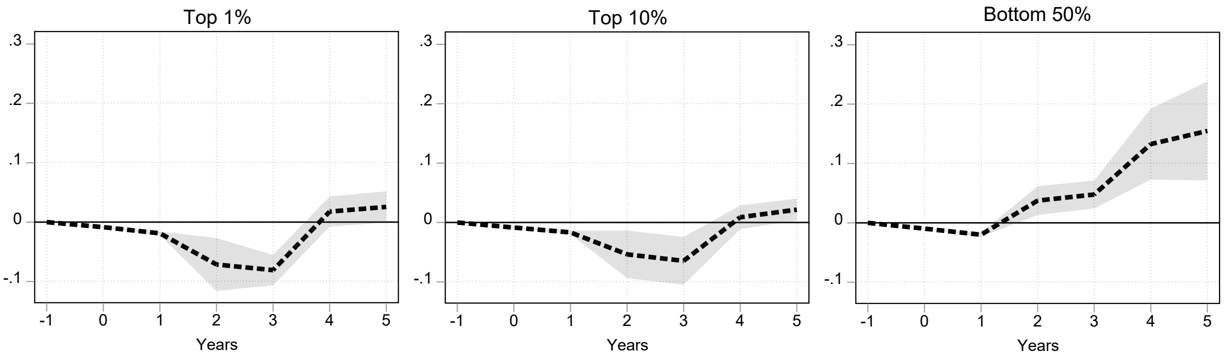
higher borrowing costs when they have the market power to do so and demand is still strong at the beginning of a tightening cycle (Konczal & Lusiani, 2022). Other factors, like the increase in interest income to deposit and bond holders, may also produce an initial positive effect on effective demand under certain conditions (Tauheed & Wray, 2006).

Nevertheless, rising borrowing costs eventually start to bite, increasing the cost of capital expenditure by firms, constraining firm expansion at the extensive margin and, therefore, labor demand. Households are also affected by the increased cost of borrowing for durable goods consumption, e.g., cars, housing, appliances, etc. To the extent that contractionary monetary policy puts downward pressure on labor demand, job growth will fall or even turn negative, causing unemployment to rise, reducing household income and consumer demand. To the extent inflation is of the demand-pull variety, meaning inflation is due to excess aggregate demand relative to supply, the inflation rate will start to fall. But if inflation is of the cost-push variety, on the other hand, e.g., due to supply chain disruptions, inflation may subside but will be due to the weakening of aggregate demand, even though it is not the source of the price shock.

Our baseline LP-IV response estimates indicate that a 100 bp increase in the policy rate reduces inflation by 2 percent. Given this is a linear model, that would imply that if the Fed desired to rein in the excess inflation with contractionary policy, it needs to increase the policy rate by at least 50bp for every 1 percent increase in inflation above its 2 percent target; it will take about three years for the inflation to fall before the effect begins to dissipate. For this analysis, we take that as given.

Now let us consider the most recent inflation shock since the pandemic. The result clarifies why the Fed has acted aggressively in this tightening cycle as it implies the Fed would need to respond to an inflation acceleration of 6 percent with an increase in the policy rate on the order of 300 bp or more to tame inflation back to its previous rate—assuming all else constant.

Fig. 9: Impulse responses of log of mean real net wealth to a 1 percent increase in inflation



Notes: This figure shows LP-IV responses of the log of mean real net wealth to a 1 percent unanticipated increase in the inflation rate for the top 1%, top 10%, and bottom 50% of the wealth of distribution. For these estimates, only lagged inflation was used as an instrument. Light shaded region indicates 90 percent confidence bands obtained from Newey-West robust standard errors. The horizontal axis is measured in years since the shock. The vertical axis is measured in log point changes which closely approximate percentage point change for values less than 0.2.

Moreover, to the extent inflation continues to rise to 8 and 9 percent since the beginning of 2022, Fed officials will likely see further need to continue its aggressive tightening cycle to a level it is convinced will reduce the "excess" inflation back down to the 2 percent average target it has publicly committed to achieving.

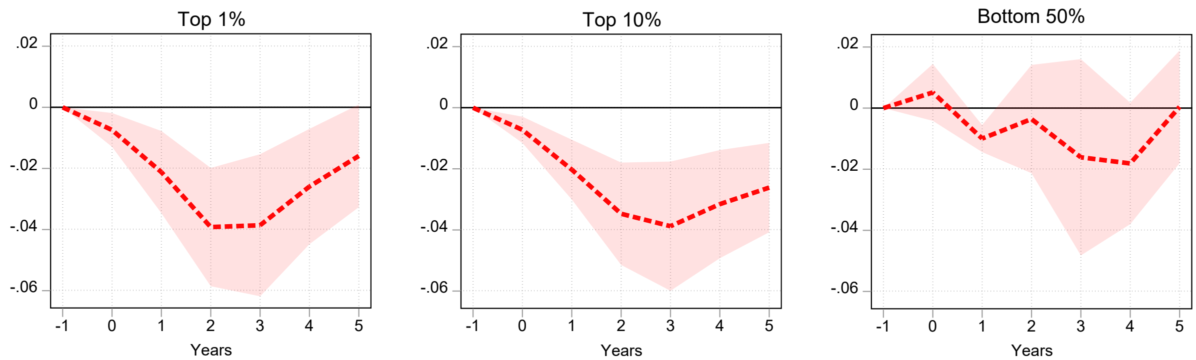
5.2.2 Inflation on wealth

Next, we estimate the dynamic effects of inflation on the mean real net wealth for the top 1%, top 10%, and bottom 50% of the distribution. Figure 9 reports the impulse responses of mean wealth to a 1 percent increase in the inflation rate. The response estimates are reported in Table A5 of the Appendix.

According to Figure 9, mean net wealth falls in response to a rise in the inflation rate for the wealthy but increases for the bottom half. For the top 1%, the first panel, mean wealth falls 8.3 percentage points after three years; the effect dissipates by the fourth year. For the top 10%, the middle panel, mean wealth also falls by 6.5 percentage points after three years. For the bottom 50%, their real wealth initially declines less than a percentage point in the first year before rising to 5 percent by the third year after the shock. Our estimates indicate the effect is not only positive but statistically significant and sustained into the fourth and fifth years, increasing 15 percent by the fifth year. This result is consistent with the literature on inflation, such as Doepke and Schneider (2006): inflation hurts the rich while helping the bottom half, of which a substantial portion are net debtors.

Note that these estimates are based on a linear model. Therefore, it is assumed that a 1 percent decrease in the inflation rate (i.e., disinflation) would produce an inverse effect—increasing the real wealth at the top and decreasing it for the bottom half of the distribution—of the same magnitude. Therefore, we use the inverse sign of these estimates to compute the indirect effect of contractionary monetary policy when considering the counterfactual of non-intervention by the Fed.

Fig. 10: Impulse responses of log mean real net wealth to a 100 bp increase in the policy rate



Notes: This figure shows LP-IV responses of the log of mean real net wealth to a 100 bp unanticipated increase in the policy rate for the top 1%, top 10%, and bottom 50% of the wealth of distribution. The Romer-Romer instrument was used with contemporaneous control variables. Light shaded region indicates 90 percent confidence bands obtained from Newey-West robust standard errors. The horizontal axis is measured in years since the shock. The vertical axis is measured in log point changes which closely approximate percentage point change for values less than 0.2.

5.2.3 Monetary policy on wealth

The results presented in Figure 10 illustrate the wealthy's rational preference for a low inflation environment maintained by the Fed's high-interest rates to preserve the real value of their assets. But is the cure worse than the disease?

Figure 10 presents the impulse responses of mean real net wealth to a 100 bp increase in the policy rate. Point estimates are also reported in Table A5 of the Appendix. Figure 10 indicates that contractionary monetary policy does have a higher cost for the wealthy. The effect is immediate and significantly negative, decreasing real wealth for the top 1% and 10% by about 4 percent by the third year, after which the effect diminishes in the fourth and fifth years. Mean net wealth also declines for the bottom half of the distribution but is only statistically significant for the first year.

5.2.4 Comparing counterfactuals: what is the net effect?

Comparing dynamic effects from the two prior figures, inflation on wealth versus contractionary policy on wealth, contractionary monetary policy has less impact on wealth than inflation for the top 1% and 10% of wealth distribution, but vice versa for the bottom 50%. Therefore, the wealthy may prefer the Fed to intervene even as they will pay a cost associated with the contractionary policy. That cost is the direct impact contractionary monetary policy will have mean wealth. The benefit, or net gain, however, would be the differential between the outcome after Fed intervention and the counterfactual of non-intervention, i.e., permitting inflation to rise above the desired level and erode wealth in real terms.

Table 1 reports the net gain or loss for each class from monetary policy intervention relative to the counterfactual of non-intervention based on the estimates obtained from responses in Figures 9 and 10. This baseline scenario assumes the Fed anticipates a 1 percent increase in inflation and intervenes aggressively with a 1-for-1 increase in the policy rate of 100 bp (or 1 percent). The difference between allowing inflation to remain at the 1 percent higher level and intervening net benefits the top 1% and 10% by preserving or shielding their net wealth from 4.3 percent and 2.6 percent cumulative decline in the third year after the shock. Beyond three years, the effect is negative as inflation appears to dissipate in the fourth and fifth years. However, the effect of monetary policy is longer lasting based on Figures 8 and 9, respectively.

This result leads us to the same conclusion. While the wealthy still lose wealth in either scenario, they lose less wealth when the Fed raises interest rates than they would otherwise. Therefore, the contractionary policy by the Fed serves as a real wealth protection policy for the top 1% of the wealth distribution.

What about the bottom 50%? In theory, the Fed's fight against inflation should worsen their net real wealth position because they tend to be net debtors and would have to forgo some debt erosion benefits from higher inflation. In fact, Table 1 suggests that households in the bottom 50% do lose in real terms, with mean net wealth decreasing cumulatively to about 6 percent by the third year and dramatically increasing to 14 percent by the fifth year. However, these effects are not statistically significant, as in our earlier estimates.

Overall, these decomposition exercises led to the mixed factors driving the net impact on wealth outcomes of tight monetary policy in the face of high inflation, yielding the same results we found in our earlier analysis. To reiterate, interest rate increases by the Fed in the face of high inflation rates serve to protect the real wealth of the top 1%, relative to the outcome if the Fed had sat on its hands and done nothing.

Table 1. Baseline: Net gain/loss with MP intervention

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Log scale change						
Top 1%	0.001	-0.002	0.032	0.042	-0.044	-0.042
Top 10%	0.001	-0.004	0.019	0.026	-0.04	-0.048
Bottom 50%	0.015	0.01	-0.041	-0.064	-0.151	-0.154
Adjusted to percent change						
Top 1%	0.108	-0.231	3.274	4.315	-4.271	-4.069
Top 10%	0.132	-0.358	1.913	2.616	-3.961	-4.666
Bottom 50%	1.491	1.002	-4.026	-6.184	-13.997	-14.304

Notes: This table provides estimates of the computed differential, i.e., the net gain or loss, for each wealth class of Fed a 100 bp contractionary policy intervention in response to a 1 percent increase in the inflation rate compared to the counterfactual of non-intervention. The point estimates for this computation are obtained from those in Table A5 of the Appendix for the effect of inflation on wealth, Figure 8, and monetary policy on net wealth, Figure 9. The point estimates are expressed in log points and then converted into the cumulative percentage change by exponentiating the estimate, subtracting 1, and multiplying by 100.

6. CONCLUSION

In this paper, we have conducted an exercise to assess the impact of contractionary Federal Reserve monetary policy on net real wealth in the context of recent monetary and macroeconomic dynamics of the previous 40 years or so. We apply our estimates of these monetary and macroeconomic relationships to predict the impact of a 375 basis point increase in interest rates by the Fed and a 6 percent increase in the inflation rate on real net wealth along the U.S. wealth distribution. The simulated Fed policy and inflation rate correspond to the actual environment in the U.S. in 2022. Our results show that this policy would have raised the real wealth of the top 1% of the wealth distribution compared with no restrictive policy by the Fed. Hence, this is evidence that the Fed's anti-inflationary policy can serve as a wealth protection device for the 1%.

Our results do not prove that this is the only goal of the Federal Reserve or that it is even a goal of Fed policymakers. What they do add is evidence to a small but growing body of research that has tried to empirically estimate the impact of central bank monetary policy on income and wealth distribution in the US and elsewhere.

Along those lines, we are conducting research that suggests that Fed monetary policy has historically contributed to wealth inequality even in a low inflation environment. Whereas this paper focuses on contractionary Fed policy, in a separate paper, we look at the impact of expansionary monetary policy with a focus on low inflation periods, such as the 1990s and early 2000s. We provide evidence that expansionary monetary policy increases the net real wealth of the top 1% even in a low inflation environment.[10] Putting the two together would suggest that a central bank that wants to increase the wealth of the top 1% would pursue loose monetary policy in a low-inflation environment to pump up nominal (and real) asset prices and raise interest rates in a high-inflation environment to protect their wealth. This behavior roughly mirrors Fed policy for the last several decades.

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[10] A complete analysis would also have to include the issue of financial sector bail-outs by the Federal Reserve (see Pollin and Epstein, 2021).

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APPENDIX

Table A1: Macroeconomic data

Variable	Description	Time period	Source
Policy rate	Federal funds rate set by the FOMC	1969 - 2012	FRED
Inflation	Year-over-year percent change in Consumer Price Index (CPI), all urban consumers	1969 - 2012	FRED
Unemployment	Seasonally adjusted unemployment rate	1969 - 2012	FRED
GDP growth	Year-over-year percent change in GDP	1969 - 2012	FRED
Treasury yield	10-year treasury note yield at constant maturity	1969 - 2012	FRED
Consumer inflation expectations	University of Michigan Survey of Consumers expected inflation over the next 12 months*	1978 - 2012	FRED
Stock price	Wilshire 5000 Price Index	1971 - 2012	FRED
House prices	FHFA transaction index	1971 - 2012	FRED

Notes: This table summarizes the macroeconomic data used in LP-IV estimates of IRFs. It provides a description of each variable, period for which it is available, and the source where it can be obtained. * Consumer inflation expectations are used in constructing an alternative instrument variable for inflation using the difference between actual inflation and consumers inflation expectations.

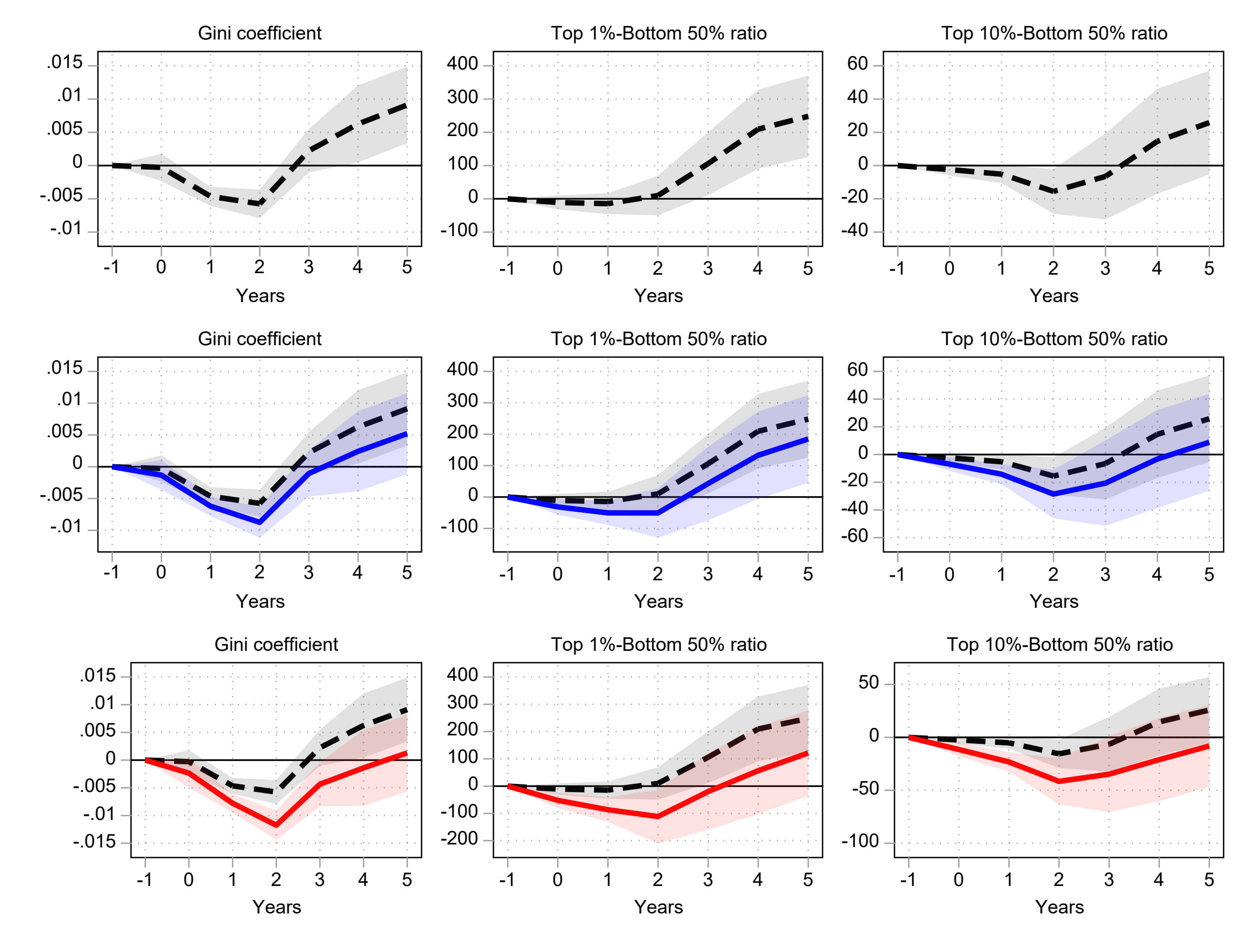
Table A2: Weak identification tests

	(1)	(2)	(3)	(4)
Distributional statistics				
Gini index	10.6*	9.6*	16.29**	19.7***
99/50	8.08	13.34*	27.10***	38.43***
90/50	7.65	13.59*	10.71*	132.00***
Avg. real net wealth				
Top 1%	7.5	19.08**	53.40***	5.29
Top 10%	14.07*	27.51***	28.15***	13.68**
Bottom 50%	12.14*	26.77***	37.78***	63.00***

Notes: This table reports Kleibergen-Paap rk Wald F statistics for each local projection specification evaluated against Stock-Yogo critical values. The null hypothesis is that equation is weakly identified. *, **, *** indicate null hypothesis of weak instruments is rejected at the 20, 15, 10% levels, respectively.

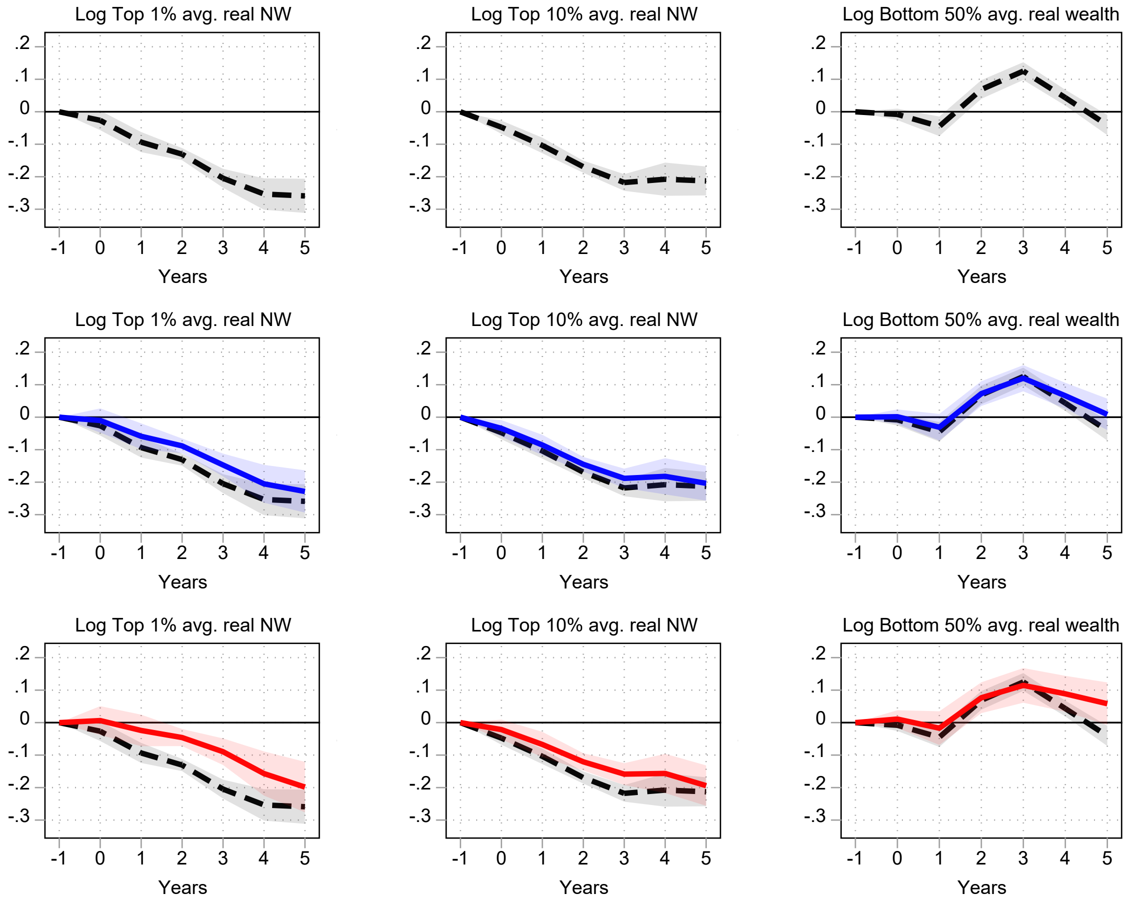
In specification (1), we use lagged inflation as an instrument and include controls for unemployment, GDP growth, and 10-year T-note yield. In (2), we add lag controls for equity prices and house prices which appear to improve identification as the test statistic yields large values that clear Stock-Yogo critical values. In specification (3), we change the instrument for inflation to a shock measure computed as the differential between actual inflation and households' inflation expectations. We use the same controls as in (1). When we add controls for equities and house prices in (4), identification appears to weaken, especially for the top 1% average net wealth. Therefore, we rely on model (2) to present our main results in Figure 5-6 and model (3) in Figure A1-A2 of the Appendix.

Figure A1: Estimated effects on Gini index and wealth ratios using an alternative inflation instrument



Notes: The figure shows cumulative impulse responses to the Gini index and ratios of the top 1% and 10% relative to the bottom 50% (a measure of the wealth gap) after a 6% unanticipated increase in the inflation rate (top row), for which we adopt an alternate instrument variable (differential between households' inflation expectations and actual inflation), and a simultaneous unanticipated contractionary shock to the policy rate (still using Romer-Romer shocks as an instrument) of 200 basis points (middle row, blue line) and 375 basis point increase (bottom row, red line). Light shaded regions corresponding to the color of each line denote 10 percent confidence bands obtained from Newey-West robust standard errors.

Figure A2: Estimated effects on average real wealth by class using an alternate inflation instrument



Notes: The figure shows cumulative impulse responses of log average real net wealth for the top 1%, 10%, and bottom 50% after a 6% unanticipated increase in the inflation rate (top row), in which we use our alternative inflation shock measure as an instrument, and a simultaneous unanticipated contractionary shock to the policy rate of 200 basis points (middle row, blue line) and 375 basis point increase (bottom row, red line). Light shaded regions corresponding to the color of each line denote 10% confidence bands obtained from Newey-West robust standard errors. The time scale on the horizontal axis is measured in years. The vertical axis measures the cumulative change in logscale which approximate percentage change in the value of the variable—0.2 or below—over the indicated time horizon.

Table A3: Impulse response estimates reported in Fig. 6

Year after shock:	Y0	Y1	Y2	Y3	Y4	Y5
Gini coefficient						
Inflation shock 6%	0.006	-0.003	-0.006	-0.011	-0.005	-0.005
	[0.004, 0.005]	[-0.008, -0.004]	[-0.009, -0.009]	[-0.014, -0.013]	[-0.009, -0.008]	[-0.007, -0.007]
Inflation + MP shock 200 bp	0.005	-0.004	-0.009	-0.013	-0.008	-0.007
	[0.008, 0.002]	[0.001, -0.009]	[-0.006, -0.013]	[-0.01, -0.017]	[-0.003, -0.012]	[-0.005, -0.009]
Inflation + MP shock 375 bp	0.004	-0.004	-0.012	-0.015	-0.010	-0.009
	[0.007,0]	[0.001,-0.01]	[-0.008, -0.016]	[-0.011, -0.02]	[-0.005, -0.015]	[-0.006, -0.011]
T1-B50 ratio						
Inflation shock 6%	-34.893	-196.152	-300.599	-250.212	-83.899	-91.601
	[-12.138, -57.647]	[-158.478, -233.827]	[-248.814, -352.384]	[-205.155, -295.269]	[-39.827, -127.972]	[-16.533, -166.669]
Inflation + MP shock 200 bp	-41.023	-196.171	-323.968	-269.584	-127.820	-120.706
	[-12.927, -69.119]	[-148.474, -243.868]	[-257.124, -390.811]	[-208.174, -330.993]	[-72.956, -182.684]	[-30.606, -210.805]
Inflation + MP shock 375 bp	-46.387	-196.187	-344.415	-286.534	-166.250	-146.172
	[-13.617, -79.157]	[-139.72, -252.654]	[-264.395, -424.435]	[-210.816, -362.252]	[-101.944, -230.556]	[-42.92, -249.425]
T10-B50 ratio						
Inflation shock 6%	-9.152	-41.920	-71.157	-57.029	-12.286	-2.459
	[-3.067, -15.237]	[-32.791, -51.048]	[-53.763, -88.551]	[-32.359, -81.698]	[3.209, -27.78]	[10.609, -15.528]
Inflation + MP shock 200 bp	-10.624	-44.810	-76.518	-61.578	-22.023	-12.165
	[-3.334, -17.914]	[-33.732, -55.888]	[-56.576, -96.461]	[-33.4, -89.755]	[-3.949, -40.097]	[3.977, -28.308]
Inflation + MP shock 375 bp	-11.912	-47.339	-81.210	-65.558	-30.544	-20.658
	[-3.567, -20.257]	[-34.554, -60.123]	[-59.037, -103.382]	[-34.311, -96.805]	[-10.213, -50.875]	[-1.827, -39.49]

Notes: The table reports the point estimates from impulse responses of the Gini coefficient and wealth ratios of the top 1% and 10% relative to the bottom 50% (a measure of the wealth gap) to inflation and monetary policy shocks as shown in Figure 6. Brackets below the point estimates at each horizon indicate the 90-percent confidence intervals derived from Newey-West robust standard errors.

Table A4: Impulse response point estimates from Fig. 7

Year after shock:	Y0	Y1	Y2	Y3	Y4	Y5
Log mean net wealth Top 1%						
Inflation shock 6%	-0.168	-0.269	-0.309	-0.322	-0.115	0.084
	[-0.15, -0.185]	[-0.241, -0.297]	[-0.269, -0.348]	[-0.237, -0.406]	[-0.074, -0.156]	[0.124, 0.044]
Inflation + MP shock 200 bp	-0.111	-0.173	-0.230	-0.248	-0.101	0.043
	[-0.084, -0.137]	[-0.132, -0.214]	[-0.18, -0.281]	[-0.141, -0.354]	[-0.048, -0.153]	[0.094, -0.009]
Inflation + MP shock 375 bp	-0.061	-0.089	-0.162	-0.183	-0.088	0.007
	[-0.026, -0.095]	[-0.036, -0.141]	[-0.103, -0.222]	[-0.057, -0.309]	[-0.025, -0.15]	[0.068, -0.055]
Log mean net wealth Top 10%						
Inflation shock 6%	-0.086	-0.104	-0.149	-0.173	-0.082	0.050
	[-0.068, -0.105]	[-0.071, -0.136]	[-0.125, -0.173]	[-0.141, -0.206]	[-0.045, -0.119]	[0.07, 0.03]
Inflation + MP shock 200 bp	-0.058	-0.069	-0.113	-0.139	-0.069	0.038
	[-0.033, -0.082]	[-0.027, -0.112]	[-0.081, -0.145]	[-0.096, -0.182]	[-0.024, -0.114]	[0.064, 0.012]
Inflation + MP shock 375 bp	-0.032	-0.039	-0.082	-0.109	-0.058	0.028
	[-0.003, -0.062]	[0.013, -0.092]	[-0.043, -0.121]	[-0.057, -0.16]	[-0.006, -0.109]	[0.059, -0.003]
Log mean net wealth bottom 50%						
Inflation shock 6%	-0.044	0.094	0.199	0.070	-0.069	-0.079
	[0.02, -0.108]	[0.195, -0.007]	[0.354, 0.044]	[0.176, -0.036]	[-0.021, -0.117]	[-0.031, -0.127]
Inflation + MP shock 200 bp	-0.023	0.135	0.246	0.090	-0.036	-0.018
	[0.049, -0.096]	[0.254, 0.016]	[0.417, 0.074]	[0.216, -0.037]	[0.025, -0.097]	[0.043, -0.079]
Inflation + MP shock 375 bp	-0.005	0.171	0.287	0.108	-0.008	0.035
	[0.075, -0.085]	[0.305, 0.037]	[0.472, 0.101]	[0.252, -0.037]	[0.065, -0.08]	[0.107, -0.036]

Notes: The table reports the point estimates from impulse responses of the log of mean net wealth for the top 1% and 10% to inflation and monetary policy shocks as shown in Figure 7. Brackets below the point estimates at each horizon indicate the 90-percent confidence intervals derived from Newey-West robust standard errors.

Table A5: Impulse response estimates for Fig. 8-10

Year after shock:	Y0	Y1	Y2	Y3	Y4	Y5
Fig. 8. Impulse response of inflation to 100 bps increase in the policy rate						
	0.227*	0.0997	-0.687***	-2.003***	-2.353***	-1.149***
	[0.0510, 0.403]	[-0.427, 0.627]	[-0.974, -0.401]	[-2.657, -1.348]	[-3.059, -1.647]	[-1.543, -0.754]
Fig. 9. Impulse response of mean net wealth to 1% increase of inflation rate						
Top 1%	-0.00848***	-0.0189***	-0.0714**	-0.0808***	0.0177	0.0256
	[-0.0100, -0.00693]	[-0.0219, -0.0158]	[-0.116, -0.0268]	[-0.106, -0.0552]	[-0.00769, 0.0431]	[-0.000686, 0.0520]
Top 10%	-0.00856***	-0.0167***	-0.0537*	-0.0646**	0.00886	0.0217
	[-0.00966, -0.00747]	[-0.0197, -0.0136]	[-0.0937, -0.0136]	[-0.105, -0.0244]	[-0.0112, 0.0289]	[0.00312, 0.0402]
Bottom 50%	-0.00967***	-0.0199***	0.0375*	0.0477***	0.133***	0.155**
	[-0.0101, -0.00927]	[-0.0234, -0.0164]	[0.0133, 0.0618]	[0.0242, 0.0713]	[0.0729, 0.192]	[0.0714, 0.238]
Fig. 10. Impulse response of mean net wealth to 100 bps increase in the policy rate.						
Top 1%	-0.00740*	-0.0212**	-0.0392***	-0.0386**	-0.0259*	-0.0159
	[-0.0129, -0.00187]	[-0.0346, -0.00776]	[-0.0585, -0.0198]	[-0.0618, -0.0153]	[-0.0448, -0.00705]	[-0.0327, 0.000893]
Top 10%	-0.00724**	-0.0202***	-0.0347***	-0.0388**	-0.0316**	-0.0261**
	[-0.0116, -0.00293]	[-0.0300, -0.0105]	[-0.0515, -0.0179]	[-0.0599, -0.0176]	[-0.0493, -0.0139]	[-0.0407, -0.0115]
Bottom 50%	0.00513	-0.00995***	-0.00358	-0.0161	-0.0181	0.00041
	[-0.00417, 0.0144]	[-0.0144, -0.00552]	[-0.0213, 0.0141]	[-0.0482, 0.0160]	[-0.0380, 0.00176]	[-0.0180, 0.0189]

Notes: The table shows point estimates of impulse response functions of real mean net wealth plotted in Figures 7, 8, and 9. Figures 7 is measured in percent change while Figures 8 and 9 are reported in log point change. The rows for each shock series show the point estimates of the response after 1 to 5 years. Brackets below the point estimates at each horizon show the 90-percent confidence intervals from Newey-West robust standard errors. *, **, *** indicate significance at the 10 percent level, 5 percent level, and 1 percent level, respectively.