Monetary Policy and Distributional Inflation: New Evidence on Age and Racial Heterogeneity

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Abstract

This paper investigates the heterogeneous effects of monetary policy on inflation across demographic groups, focusing on age and race. Using newly developed distributional Consumer Price Indices we find significant variation in how monetary policy shocks affect different segments of the population. Young people and Black and Native Americans experience larger declines in their group-specific CPIs following contractionary monetary policy shocks compared to other groups. We also document non-linear effects across income percentiles. These findings highlight the importance of considering inflation heterogeneity in monetary policy analysis and adds to the growing literature that finds that central bank actions can have unintended distributional consequences.

JEL classification: E31, E52, J15, J14, E58

Keywords: monetary policy, inflation heterogeneity, racial inequality, age disparities

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1 Introduction

The distributional effects of monetary policy have become a focal point of macroeconomic research in recent years. This paper contributes to this growing body of literature by examining the heterogeneous effects of monetary policy on inflation across various demographic groups, with a particular focus on age and race.

The relationship between monetary policy and inequality has been extensively studied, with researchers investigating its impacts on income, wealth, and consumption disparities (see for example McKay and Wolf (2023) and Coibion et al. (2017)). However, the specific channel of inflation heterogeneity - the idea that different groups experience different inflation rates - has received comparatively less attention in the context of monetary policy transmission.

Recent advances in the measurement of group-specific inflation rates have opened up new avenues for research in this area. Studies by Jaravel (2021), Argente and Lee (2020) and Pallotti et al. (2024) have highlighted significant heterogeneity in inflation experiences across income groups. Building on these findings, researchers have begun to explore the effects of monetary policy on this inflation heterogeneity. Ampudia, Ehrmann, and Strasser (2024), Lauper and Mangiante (2023), Cravino, Lan, and Levchenko (2020), and Del Canto et al. (2023) are recent papers that examined how monetary policy impacts inflation rates across different income groups, revealing varying degrees of responsiveness to policy shocks.

Our paper extends this literature by focusing specifically on the age and racial dimensions of inflation heterogeneity in the context of monetary policy transmission. By examining these demographic categories, we aim to uncover potentially important distributional effects that may be obscured when looking at income alone. We leverage newly developed distributional Consumer Price Indices (D-CPIs) by Jaravel (2024) and employ a structural vector autoregression with external instruments methodology to provide a comprehensive analysis of how monetary policy shocks differentially affect inflation rates across age and racial groups.

Our results reveal significant heterogeneity in the inflationary effects of monetary policy across both age and racial groups. We find that young people experience a larger decline in their group-specific CPI following a contractionary monetary policy shock compared to older individuals. This difference is both statistically significant and economically meaningful, with prices faced by young people falling by approximately one-third more than those faced by older people six months after the shock.

In terms of racial differences, we uncover substantial variation in the inflation responses to monetary policy shocks. Prices faced by Black and Native Americans fall considerably more than the overall CPI, while those faced by Asian/Pacific Islanders and other racial groups fall less. The response for white Americans is similar to the overall CPI. These findings suggest that monetary policy may have unintended distributional consequences along racial lines.

Our work contributes to the nascent but growing literature that links monetary policy to racial inequality. Recent studies have examined various aspects of this relationship: Lee, Macaluso, and Schwartzman (2021) investigate how monetary policy impacts income volatility across Black and white households, while Bartscher et al. (2022) analyze the effects of monetary policy on employment and wealth differentials between Black and white households. Additionally, Gerardi, Willen, and Zhang (2023) demonstrate that expansionary monetary policy can exacerbate racial disparities in mortgage costs due to differences in refinancing behavior. Our paper is also related to the literature on the effects of monetary policy across age groups, see for example Berg et al. (2021), Wong (2018) and Leahy and Thapar (2022). This literature primarily focuses on the effects of monetary policy on consumption with some mixed results. Our analysis complements these studies by focusing specifically on the heterogeneous inflationary impacts of monetary policy across racial and age groups, thus providing a new dimension to understanding the distributional consequences of central bank actions.

2 Data

We combine the recently created distributional CPI measure of Jaravel (2024) with measures of monetary policy shocks constructed from high frequency asset prices around FOMC announcement days.

2.1 Distributional inflation measure

We utilize the distributional Consumer Price Indices (D-CPIs) developed by Jaravel (2024) for the United States, covering the period from 1983 to the present. These D-CPIs are constructed using publicly available data from the Bureau of Labor Statistics (BLS), including monthly price changes from the Consumer Price Index (CPI) and annual expenditure shares from the Consumer Expenditure Survey (CEX). The methodology follows the same data construction steps as the official CPI, but computes expenditure shares across socio-demographic groups (e.g., income percentiles, age, race, urban vs. rural). This measure also closely follows a recent measure constructed by BLS researchers (Klick and Stockburger (2024)).

2.2 Monetary policy shocks

We employ the monetary policy shock series developed by Bauer and Swanson (2023), which refines high-frequency futures-based measures constructed around FOMC announcements. This series orthogonalizes the shocks with respect to publicly available economic data, better isolating true monetary surprises. Spanning 1988-2019, it allows us to examine a more recent period, while shock measures like Romer and Romer (2004) typically end around 2007-2008.

3 Results

To estimate the causal effects of monetary policy on distributional CPI, we employ a structural vector autoregression with external instruments (proxy-SVAR). This approach is preferred over local projections (Jordà, 2005) due to the mismatch in data availability: our distributional CPI data begins in 1983, while the futures-based monetary policy shocks are only available from around 1990. The proxy-SVAR framework allows us to estimate the reduced-form VAR using the full sample from 1983 onward, while identifying monetary shocks using the shorter sample of available high-frequency measures. For details on this issue in proxy-SVAR methodology, we direct readers to Gertler and Karadi (2015).

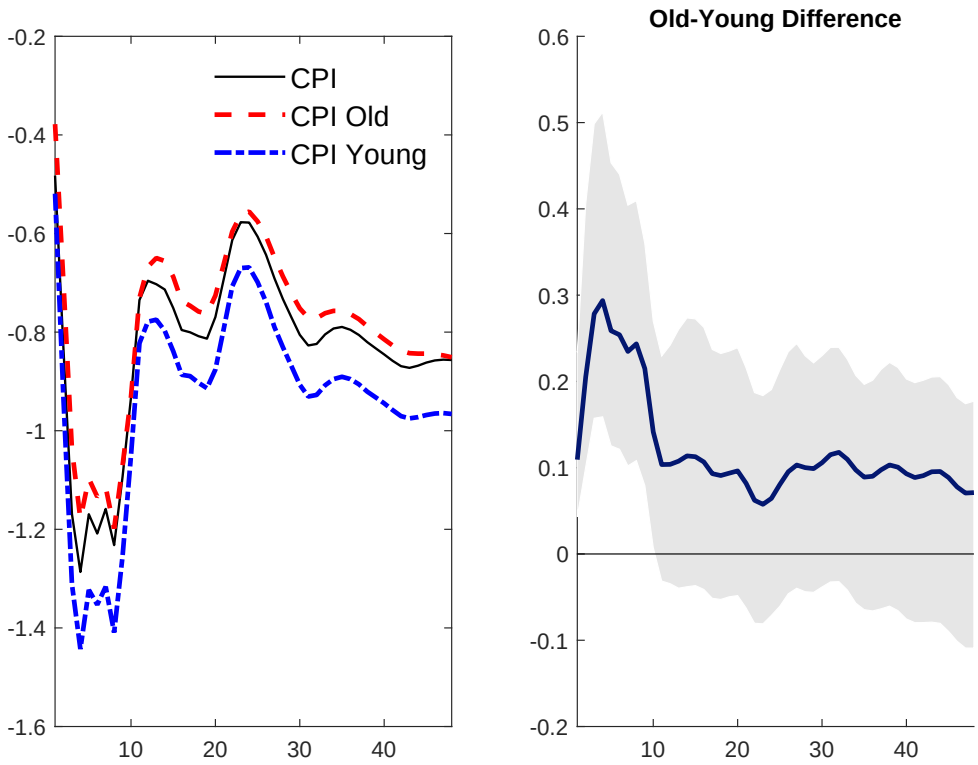
Our baseline VAR has the following monthly variables: output as measured by log of industrial production, overall prices measured by the log of CPI, interest rates as measured by the 1 year Treasury rate (to allow for target rate and forward guidance shocks), and the excess bond premium of Gilchrist and Zakrajšek (2012). In Appendix Figure A.1 we show the impulse responses of these variables to a monetary policy shock reflecting a 25 basis point increase in the 1 year Treasury rate. These results corroborate well-established findings in the literature (e.g., Gertler and Karadi (2015)): output and inflation decline while the excess bond premium rises. Quantitatively, we observe that aggregate prices are approximately 1% lower one year after the shock. Having established the consistency of our aggregate results with existing literature, we now shift our focus to the central contribution of this paper: the distributional effects of monetary policy on inflation across different household groups.

We introduce the distributional inflation measures in the VAR in two different ways. First, in our 4 variable aggregate VAR we replace the overall CPI with the category specific CPI one at a time and individually estimate the effects of monetary policy on the category specific inflation. This allows us to estimate the effects of monetary policy on inflation for each specific demographic or income group individually. We then plot these category-specific impulse responses alongside the overall CPI response, facilitating a direct visual comparison of the differential effects across groups. Second, we augment the aggregate VAR (retaining the overall CPI) with an additional variable that captures the inflation differential between two categories, such as "old - young" or "Black - overall." This helps us conduct inference on the statistical significance of the differences.

We first start with inflation differences by age shown in Figure 1. The left panel reveals a notable divergence: the CPI for younger individuals exhibits a more pronounced decline compared to the overall CPI, while the CPI for older individuals shows a more muted response. This pattern suggests that monetary policy has heterogeneous effects across age cohorts. The right panel quantifies this divergence, demonstrating that the difference in price responses between older and younger demographics is statistically significant for approximately a year following the shock. The economic magnitude of these effects is substantial: at the six-month horizon,

prices faced by younger individuals decrease by roughly one-third more than those experienced by older individuals.

Figure 1: Effects of monetary policy on inflation by age

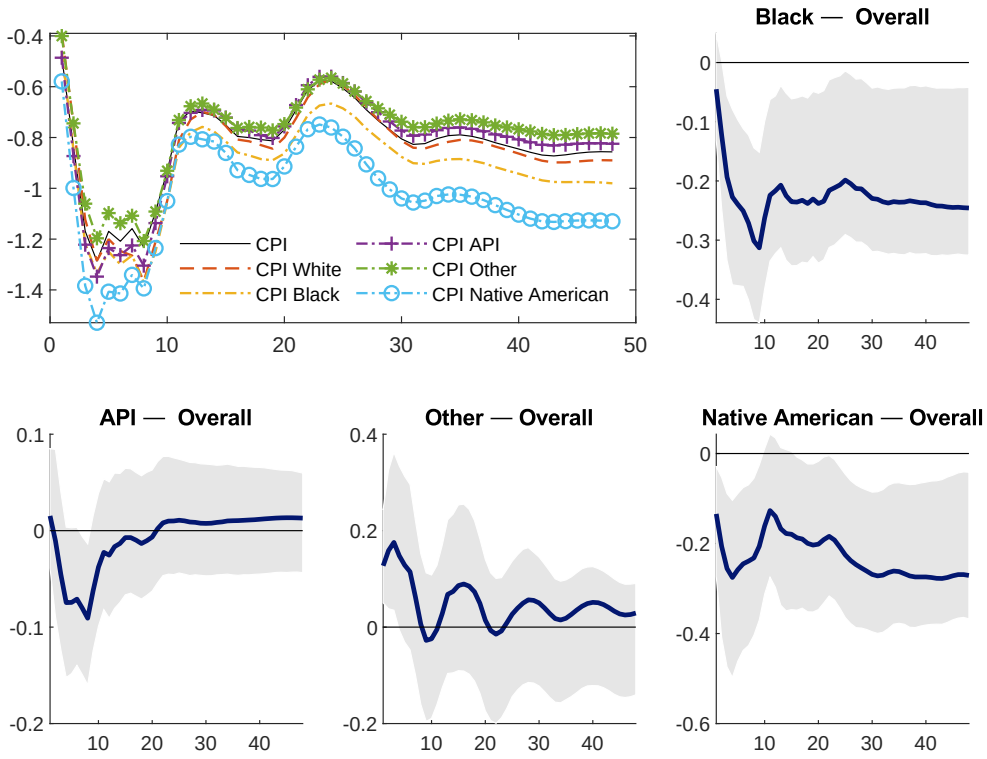


Impulse responses to a 25 basis point contractionary monetary policy shock. The top left panel shows the response of overall CPI together with age specific CPI and the right panel shows the difference between CPI for old and CPI for young, together with shaded areas representing 90% bootstrapped confidence intervals for the difference. The reduced form VAR is estimated on a sample from 1983 to 2020 and the identification with instruments uses a sample from 1988 to 2020. Shaded areas represent 90% bootstrapped confidence intervals. See Section 3 for details

Figure 2 presents our second main finding, highlighting the differential impact of monetary policy across racial groups. The left panel reveals substantial heterogeneity in inflation responses by race. Notably, prices faced by Black and Native American households exhibit a more pronounced decline compared to the overall CPI. In contrast, prices experienced by Asian/Pacific Islander households and those categorized as "Others" show a more subdued response, falling less than the overall CPI. The inflation experience of white households is roughly similar to the response of the overall CPI. The subsequent panels quantify these disparities, illustrating the differences between race-specific CPIs relative to the overall CPI.

We also estimate the differential effects by income, shown in Appendix Figure A.2. Prices

Figure 2: Effects of monetary policy on inflation by race



Impulse responses to a 25 basis point contractionary monetary policy shock. The top left panel shows the response of overall CPI together with race specific CPI and the four other panels show the difference between CPI for whites and CPI for the other races, together with shaded areas representing 90% bootstrapped confidence intervals for the difference. The reduced form VAR is estimated on a sample from 1983 to 2020 and the identification with instruments uses a sample from 1988 to 2020. See Section 3 for details

faced by people at the highest end of the income distribution respond substantially more than overall CPI while prices faced by the median income person fall a lot more than overall CPI. While these results are broadly consistent with Lauper and Mangiante (2023) and Cravino, Lan, and Levchenko (2020), the results also highlight some potential non-linearities in the monetary policy and inflation based on income percentiles. For example, while prices fall less for the richest (100th percentile), they fall more for the 90th percentile.

We also examine the heterogeneous effects of monetary policy shocks across the income distribution, with results presented in Appendix Figure A.2. Our findings reveal substantial heterogeneity in price responses. Specifically, prices faced by households at the very top of the income distribution (100th percentile) are notably less responsive to monetary policy shocks compared to the overall CPI. In contrast, prices experienced by median-income households exhibit a much larger decline than the aggregate CPI following a contractionary monetary policy shock. While these results broadly align with the findings of Lauper and Mangiante (2023) and Cravino, Lan,

and Levchenko (2020), our analysis uncovers some non-linearities in the relationship between monetary policy effects and income percentiles. For instance, although prices fall less for the highest income percentile (100th), we observe a larger price decline for households at the 90th percentile.

4 Conclusion

This paper has examined the heterogeneous effects of monetary policy on inflation across different demographic groups, focusing on age and race. Our findings reveal disparities in how monetary policy shocks impact various segments of the population. Young people experience larger declines in their group-specific CPIs following contractionary monetary policy shocks compared to older individuals. This age-based heterogeneity could have important implications for intergenerational wealth dynamics and policy effectiveness across age cohorts. Our analysis also uncovers variation in inflation responses across racial groups. Black and Native Americans face larger declines in their group-specific CPIs compared to the overall population, while Asian/Pacific Islanders and other racial groups experience smaller declines. These racial disparities highlight potential unintended consequences and underscore the importance of considering inflation heterogeneity in the formulation and implementation of monetary policy.

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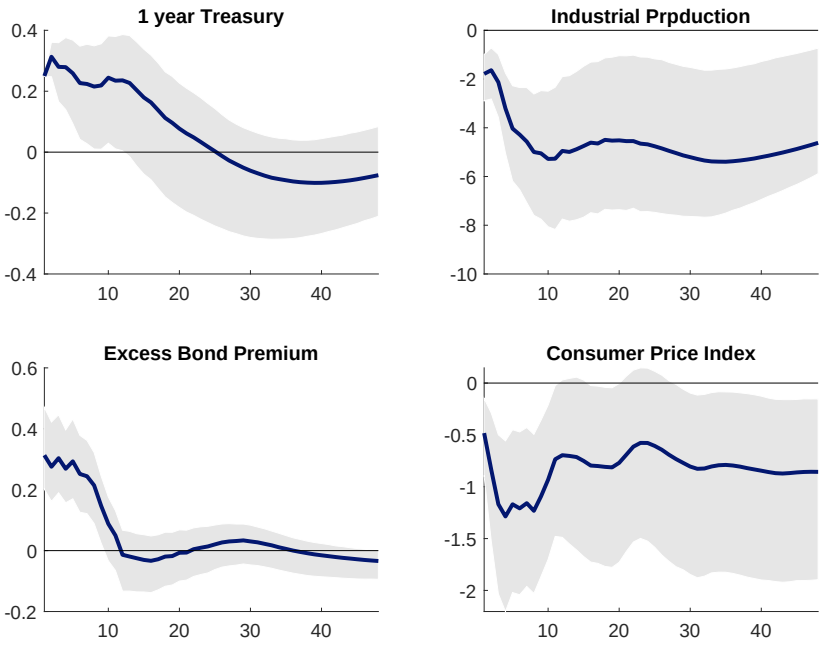
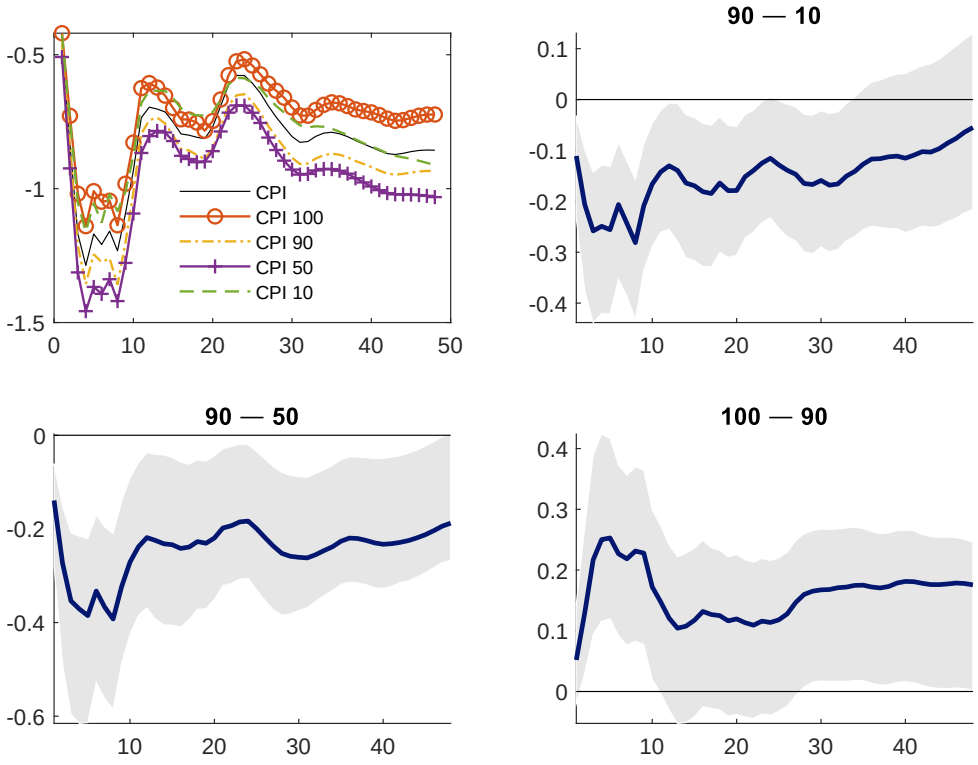
Appendix

Figure A.1: Aggregate effects of monetary policy



Impulse responses to a 25 basis point contractionary monetary policy shock. The reduced form VAR is estimated on a sample from 1983 to 2020 and the identification with instruments uses a sample from 1988 to 2020. Shaded areas represent 90% bootstrapped confidence intervals. See Section 3 for details

Figure A.2: Effects of monetary policy on inflation by income



Impulse responses to a 25 basis point contractionary monetary policy shock. The top left panel shows the response of overall CPI together with income specific CPI and the four other panels show the difference between CPI for different income percentiles, together with shaded areas representing 90% bootstrapped confidence intervals for the difference. The reduced form VAR is estimated on a sample from 1983 to 2020 and the identification with instruments uses a sample from 1988 to 2020. See Section 3 for details