Monetary Policy Transmission to Consumption: Inequalities by Gender and Race

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Abstract

This paper estimates the causal effects of monetary policy shocks on household consumption, with additional analysis of labor market and income responses, disaggregated by gender and race. I find that contractionary monetary policy reduces consumption more for black than white households, with the largest declines among households headed by black women. These gaps persist after accounting for differences in household education, debt, and income, but are partly explained by differences in marital status and spousal insurance against shocks. These shocks also lead households to shift expenditures from non-essential and durable goods toward essential non-durable goods and services. The analysis provides estimates of marginal propensities to consume across groups and shows that contractionary, rather than expansionary, shocks drive aggregate consumption responses. These findings highlight the importance of accounting for intersectional demographic heterogeneity in evaluating the distributional effects of monetary policy.

JEL classification: E21, E52, J15, J16

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1 Introduction

Understanding the distributional effects of monetary policy is crucial for effective policy-making. Previous studies have emphasized that the effects of monetary shocks on household outcomes differ by wealth, income, or labor market outcomes (Auclert 2019; Cloyne et al. 2020; Coibion et al. 2017). Others explore the disproportionate burden of contractionary policy on certain racial groups through labor market and wealth outcomes (Seguino and Heintz 2012; Bartscher et al. 2022; Amberg et al. 2022). However, no papers have estimated the effects of monetary policy on consumption responses by gender and race. It is therefore unclear whether consumption inequality can be fully understood by analyzing groups by education and finances, or whether other breakdowns of groups can shed light on other mechanisms that determine responses.

This paper addresses this question by documenting the transmission of monetary policy to consumption separately for white men, white women, black men, and black women. It is the first, to my knowledge, that estimates and explains consumption responses by gender and race with a state-of-the-art methodology and shock identification method. Contractionary policy shocks decrease consumption, raise unemployment, and decrease income for groups at different rates. Studying heterogeneous reactions solely through income inequality obscures additional reasons why monetary policy affects groups differently.

The analysis employs several data sources. I use the Consumer Expenditure Survey to measure household consumption and income and the Current Population Survey to measure labor market outcomes. I use the Bauer and Swanson (2023) monetary policy shocks, which is one of the latest high frequency measures that is relevant and exogenous. The use of high frequency shocks contributes to the literature on gender and racial inequality.

I estimate the effects of monetary policy shocks from 1988 to 2019 using the local projections instrumental variables methodology (Jordà et al. 2020). Local projections have been widely used to estimate the effects of monetary policy (Coibion et al. 2017; Bauer and Swanson 2023). I also conduct several exercises that confirm the robustness of the results including using alternative monetary policy shock series, controls, and time periods.

This paper first estimates how monetary policy affects consumption differently for U.S.

households disaggregated by gender and race. The results show that contractionary monetary policy shocks most negatively impact the consumption of black households. Following a 25 basis point (bp) contractionary shock, spending on durable goods falls by 7.5% for households headed by black women compared to 5% for households headed by white men. Spending on non-durable goods and services is decreased by 0.9% for households headed by black men, but by 0.1% for households headed by white men.

I also find that monetary policy shocks lead households to change the composition of their basket of goods. Following a contractionary shock, consumption falls for durables and non-essentials, but rises for essential non-durables and services. My analysis is novel in documenting how households substitute expenditures following a shock.

Racial and gender gaps in consumption responses persist when accounting for mechanisms commonly used in the literature such as education, mortgage debt, and income. Instead, separating households by their marital status when studying consumption, labor market, and income responses is key to understanding policy transmission. I find that married households employ spousal insurance mechanisms in the labor market that dampen the transmission of monetary policy shocks to consumption. In contrast, single households bear the full effects of contractionary shocks. Racial differences in consumption responses are greater for single households that have a lower ability to self-insure against shocks. The comparison of outcomes for all of these groups is an additional contribution to the literature.

Finally, I contribute two estimates that can inform quantitative models studying optimal monetary policy. The first is the marginal propensity to consume (MPC) in response to changes in income from a monetary policy shock. The MPC for spending on durables is larger than that for non-durables and services. The second estimate is the difference in the response of consumption to contractionary versus expansionary shocks. Contractionary, rather than expansionary, shocks drive overall household consumption responses.

1.1 Related Literature

This paper contributes to the growing literature studying how monetary policy affects inequality (see surveys by Seguino (2019) and Kappes (2023)). Important channels of the transmission of monetary policy to household consumption include earnings heterogeneity,

income composition, and debt burden (Coibion et al. 2017; Auclert 2019; Amberg et al. 2022). Empirical evidence finds that income effects dominate substitution effects on consumption and savings decisions following a change in interest rates (Coibion et al. 2017).

My paper provides new causal estimates of the effects of monetary policy shocks on household consumption, labor market outcomes, and MPCs disaggregated by both gender and race. To date, only one study—Albert and Gomez-Fernandez (2024)—has examined consumption responses by race, with no prior work considering the joint role of gender and race.

This paper advances the literature in several key ways. First, I estimate consumption responses by gender within racial groups, introducing a new dimension of heterogeneity and highlighting the role of household composition in monetary policy transmission. Second, the use of a state-of-the-art identification strategy and instrumental variables framework enables me to identify differential consumption and labor income responses by race and gender—specifically, that contractionary shocks reduce consumption and salary income more for black than white households—effects not detected in Albert and Gomez-Fernandez (2024). Third, I decompose changes in non-durable goods and services, documenting how households reallocate spending in response to shocks. Fourth, I estimate total household income responses and show that income inequality by race rises following contractionary shocks. Finally, I complement existing findings by showing that financial income and savings exhibit greater volatility for black households following shocks. Together, these contributions provide a more detailed and causally credible understanding of the distributional effects of monetary policy. I relate my findings to the following channels of monetary policy transmission.

The earnings heterogeneity channel traces the effects of monetary policy shocks on consumption through labor market outcomes and earnings. In the US, contractionary policy tends to raise unemployment more for black than white individuals, and disproportionately affects women, who are more concentrated in low-wage, precarious jobs due to historical barriers in education and employment (Thorbecke 2001; Rodgers 2008; Seguino and Heintz 2012; Ume and Williams 2019; Bergman et al. 2022; Bartscher et al. 2022; Bennani 2023). Black and women employees are also more likely to be last hired and first fired (Seguino and Heintz 2012).

Gendered labor market responses also reflect sectoral composition: men are more concentrated in cyclical industries, making them more exposed to downturns (Duzhak 2021; Jackson and Kurt 2025; Flamini et al. 2023).[1] This can trigger the "added earner effect," where other household members—often women—enter the labor force in response to male job loss (Juhn and Potter 2007). Racial and gendered norms also shape labor supply as white women are more likely to exit the labor force for unpaid care, while black women often continue working alongside community caregiving responsibilities (Banks 2020).

These dynamics matter for monetary transmission. Married households can partially insure against income shocks through joint labor supply adjustments, smoothing consumption more than single households (Browning et al. 2014; Ortigueira and Siassi 2013; Wu and Krueger 2021). Because black women are more often single heads of household, with both paid and unpaid work responsibilities, contractionary policy can reduce their consumption more sharply. I contribute to the literature by providing new evidence that spousal labor supply adjustments through the added earner effect dampen the transmission of monetary policy to household consumption.

The income composition channel explains household consumption responses through fluctuations in different sources of income. Montecino and Epstein (2017), Bartscher et al. (2022), Kim and Song (2022), and Matusche and Wacks (2023), among others, find that changes in household wealth following monetary policy shocks outweigh other effects on employment and mortgage refinancing. Albert and Gomez-Fernandez (2024) attribute racial gaps in consumption to disparities in wealth. However, most studies examine gender and racial inequalities in employment and wealth separately. This paper contributes by linking consumption, labor market, and income responses across household types.

Business and financial income are not theoretically supposed to react differently for demographic groups. What matters, are the size of the share of each category for total household income. Since assets compose a larger share of incomes for white than black households, financial incomes of white households are likely more exposed to monetary policy (Bartscher

[1]There is contrasting evidence on how monetary policies impact gender gaps in the labor market in cross-country studies. Flamini et al. (2023) find that contractionary policy negatively affects men more than women, Takhtamanova and Sierminska (2009) find no significant relationship in the OECD, and Braunstein and Heintz (2008) show that women's employment is more negatively impacted in developing countries.

et al. 2022).

The debt burden channel highlights how higher interest rates from contractionary monetary policy increase household debt burdens, particularly through mortgage costs. Cloyne et al. (2020), Wong (2015), and Kim and Lim (2020) estimate that households with mortgages drive the aggregate household consumption response to monetary policy. Black households are disproportionately affected due to higher initial mortgage rates, limited refinancing access, and higher insurance and property tax burdens (Aronowitz et al. 2020; Avenancio-León and Howard 2022; Gerardi et al. 2023).

Households that rent may be affected by changes in rental payments following contractionary policy. As higher mortgage rates reduce buying, rental demand rises, potentially increasing rents (Dias and Duarte 2022). Since a larger share of black households rent, and rental payments often do not contribute to credit histories, black households will experience a magnified effect of monetary policy (Puig 2022).

This paper also adds to the literature on MPCs and the possible state dependence of impulse response functions. My MPC estimates complement MPCs out of unemployment and transfer shocks by race and gender (Ganong et al. 2020; Patterson 2023; Puig 2025). The analysis speaks to asymmetries in monetary policy effects, contrasting studies that find either equal distributional impacts or progressive effects favoring black households (Furceri et al. 2018; Lee et al. 2021; Nakajima 2023; McKay and Wolf 2023). Although expansionary policies are progressive as in Del Canto et al. (2023), my findings demonstrate that economists must consider the sizable losses from contractionary policies.

2 Data & Methodology

2.1 Data

The time frame of analysis is 1988-2019. The data for consumption and income are U.S. household survey data from the Consumer Expenditure Survey (CE). The CE surveys households every quarter about their previous three months of consumption, income, and expenditures. It is a rotating panel, meaning that households are dropped once they are surveyed for four consecutive quarters. I impute data prior to 2004 following Coibion et al. (2017) to

account for the CE's imputation of data after 2004. The data are aggregated to a quarterly frequency and seasonally adjusted using a four quarter moving average. Values are deflated by the Consumer Price Index to create a real series in 2019 prices and converted into per capita values to control for differences in household size.[2]

Categorization of durable goods, non-durable goods and services, and total income follows the classifications in Coibion et al. (2017). Total income is composed of salary, business, financial, and other income sources such as transfers net of taxes.[3] Capital gains and losses, including dividends, are included in the definition of household financial income. The CE has less comprehensive income and wealth data relative to other surveys; however, it is still preferable given this paper's focus on consumption outcomes.

To calculate the gender and racial gaps in outcomes, households in the CE are disaggregated by the demographics of their head of household. The CE assigns a reference person for each household who provides the most information on family composition, income, taxes, and expenditures. The researchers classify this individual as the head of household due to their extensive knowledge of household details and role in the survey. In households with spouses, the CE allows for either person to be the reference person. This flexibility is an advantage over other popularly used household surveys that automatically assign this position to the male in the household. Details on the age, education, sex, and race of the reference person and other family members are provided in the raw data. I follow Cloyne et al. (2020) and Coibion et al. (2017) in using this classification of reference person as the household head. The racial analysis focuses on white and black households due to the small sample sizes of Asian, Native American, and Hispanic households.[4]

The unemployment rate, labor force participation rate, and employment ratio are from

[2]The constructed total consumption CE series is highly correlated (0.93) with the quarterly Real Personal Consumption Expenditures series by the Bureau of Economic Analysis. The constructed total after tax income CE series is correlated (0.55) with the Income After Taxes series by the Bureau of Labor Statistics (BLS). The lower correlation between the income series can be attributed to differences in their construction. The constructed CE series is quarterly and excludes certain households, while the BLS series is annual, includes all households, and needs to be converted to real values. See Appendix A for additional details on CE data cleaning.

[3]I do not estimate transfers separately from total income by gender and race due to data limitations.

[4]The CE collects data on Hispanic households starting in 2009, with data on a few Latin American nationalities starting in 2003. This limits studying this ethnicity with the entire sample and comparing responses to white and black populations.

the Current Population Survey (CPS). The CPS contains data of individuals at a monthly frequency. I construct quarterly averages of each labor market measure weighted by CPS adult final weights. The aggregate measures are then seasonally adjusted using a four quarter moving average.

The monetary policy shocks used are the high frequency series by Bauer and Swanson (2023) at a quarterly frequency. Following Bauer and Swanson (2023), this series is used in conjunction with controls for industrial production sourced from the Board of Governors of the Federal Reserve System, the consumer price index (CPI) from the BLS, and the excess bond premium from Favara et al. (2016). The control variables are measured as the average value in each quarter.

2.2 Descriptive Statistics

The CE data is consistent with the gender and racial composition of the US. In the sample, 46% of households are headed by women. Also, 87% are white and 13% are black households, mirroring the division of race within the U.S. population during this time period. Table 1 shows that average consumption is considerably lower and more volatile for black than white households. Income and savings are lower for black (women) versus white (men) households. Household differences in consumption and income are generally larger by race than gender. Black individuals, especially black men, also have the highest unemployment rates. Labor force participation is higher for men than women, but higher for black women than white women.

This distribution reflects the trends in the US population, as men and white individuals have more access to high paying and stable jobs. It may also be explained by the proportion of dual income earner households in each group since black, especially women, heads of household are more likely to be single and thus support their family alone both in income and care work. Black households also have less access to public and private goods; relying more on community care that is often provided by black women (Banks 2020).

In households headed by men, 59% of wives who do not work in formal employment instead take care of the household, providing unpaid care work and increasing familial welfare. In households headed by women, husbands who do not to work are usually retired (64%)

Table 1: Median quarterly outcome variable over the full sample

Outcome	White Men	White Women	Black Men	Black Women
HH consumption of durable goods ($)	687	596	491	382
HH consumption of non-durable goods & services ($)	3,742	3,554	3,005	2,589
HH total (after tax) income ($)	29,218	22,512	20,820	13,482
HH labor income ($)	22,486	12,920	16,225	7,453
HH business income ($)	2,647	1,556	1,104	428
HH financial income ($)	3,520	2,980	1,619	907
HH savings ($)	2,255	1,855	577	311
Unemployment rate (%)	5.4	5.0	11.7	10.2
Labor force participation rate (%)	72.7	57.6	65.8	59.5

Note: The table shows median quarterly outcomes for white men and women and black men and women. Consumption and income are at the household level (HH = Household), identified by the head of household. Labor market statistics are at the individual level. Dollar amounts are in 2019$ and per capita. Savings statistics describe households that have positive savings since most households have zero savings.

or ill or disabled (20%), possibly providing pensions to the household, but not explicitly contributing to housework. This arrangement may lead to an additional burden on these working women heads who provide unpaid care to their elderly, ill, or disabled husbands. This inequality of within-household distribution of income and unpaid work likely affects decision-making around spending on consumption (Doss 2021).

The significant differences in distribution of work and income between households disaggregated by gender and race puts into question the generalizability of aggregate household results. It is thus important to analyze the effects separately by groups of households.

2.3 Monetary Policy Shocks

Interest rates are endogenous to economic variables, as central bankers often set policy in response to aggregate economic fluctuations. It is therefore crucial to correctly identify monetary policy shocks to estimate the effects of unexpected policy rate changes on economic outcomes. Numerous methods of identifying monetary policy shocks have been used in the literature, although some result in puzzling effects on aggregate variables.

The monetary policy shocks used in this paper are the conventional high-frequency series around FOMC announcements of Bauer and Swanson (2023). This series is aggregated to a

quarterly frequency by the sum of all shocks within the quarter.[5] Bauer and Swanson (2023) identify a series of monetary policy shocks from 1988-2019. They increase the relevance of their series relative to others by expanding the set of monetary policy announcement events with publicly available data.

2.4 Empirical Methodology

The effects of monetary policy shocks on various demographic groups are estimated through local projections as in Jordà et al. (2020). Local projections are performed with the shock series as an instrumental variable to estimate the causal effect of monetary policy (Ramey 2016). I follow Bauer and Swanson (2023) in regressing each outcome of interest on the 2-year Treasury yield instrumented with the high-frequency monetary policy surprise measure at each horizon.[6] The following equation is estimated:

$$x_{g,t+h} = \alpha_{g,h} + \psi_{g,h}(L)Z_{t-1} + \beta_{g,h}Y_t^{2y} + \varepsilon_{g,t+h} \quad \text{for} \quad h = 0, ..., H-1\,, \tag{1}$$

where x is the variable of interest, α is a constant, $\psi_{g,h}(L)$ is a polynomial in the lag operator of degree 1 (allowing for 2 lags), Z is a vector of control variables, β is the coefficient of interest, Y^{2y} is the two-year Treasury yield, and ε is the residual. The vector Z includes lags of the variable of interest, two-year Treasury yield, log industrial production, log CPI, and the excess bond premium.[7] Regressions are run separately for each demographic group g (individuals or households headed by white men, white women, black men, and black women). All variables are over quarterly time t through to time horizon h. As a benchmark, the estimates cover $H = 20$ quarters. Equation 1 is estimated with a GMM estimator using the Bauer and Swanson (2023) shock as the instrument for Y^{2y} and Newey–West standard errors.[8]

[5] See the robustness section for a discussion of alternative monetary policy shock series. The results are consistent across different measures.

[6] I use the end-of-quarter two-year Treasury yield. The measure of the yield at the end of the period is suggested by Bauer and Swanson (2023) as the most adequate for their shock instrument.

[7] Control variables are included to account for variations in macroeconomic outcomes over time as in Gertler and Karadi (2015) and Bauer and Swanson (2023). Log industrial production is included for a measure of economic output, log CPI for overall market price fluctuations, and the excess bond premium for investor sentiment in the corporate bond market.

[8] The Bauer and Swanson (2023) conventional shock is used in this specification to ensure instrument

3 Monetary Policy Effects on Aggregates and Consumption

The local projections produce conventionally signed effects on most macroeconomic aggregates. The first row of Figure 1 shows that a 25bp contractionary monetary policy shock leads to a peak decrease in industrial production of 2%, increase in unemployment of 0.56pp, and decrease in household income of 2.7%. The responses of other macroeconomic aggregates are consistent in direction and magnitude with the results of Bauer and Swanson (2023) estimated via local projections and the same shock series (see Appendix B). The first-stage F-statistic of the instrumental variable in all estimations is above the Stock and Watson (2012) rule of thumb of 10 for a relevant instrument.[9]

Contractionary monetary policy shocks also lower household consumption, as shown in the second row of Figure 1. A 25bp contractionary shock decreases total consumption by 0.53%. The consumption of durable goods falls more than that of non-durable goods and services, consistent with the consumption literature (Coibion et al. (2017), among others). This leads to a widening of the consumption gap between non-durable goods and services and durable goods by 5.2%.

3.1 Consumption Responses

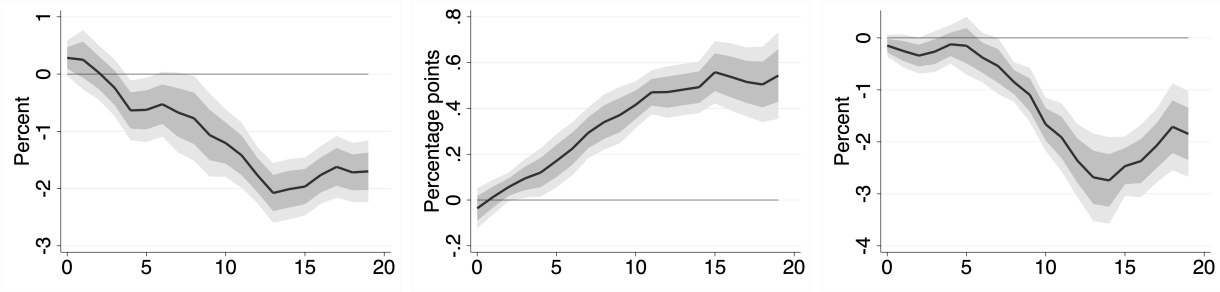
Monetary policy shocks impact consumption differently for households headed by black men, black women, white men, and white women. Figure 2 shows that following contractionary shocks, consumption falls most for black households and least for households headed by white men. The differences in group responses are statistically significant, see the first column of Appendix G. Since black households on average spend less than white households, as seen in Table 1, this result implies that consumption inequality rises after a contractionary shock.

Black households experience the largest changes in consumption following monetary pol-

validity. Bauer and Swanson (2023) propose an orthogonalized shock, but the version of this shock that is a valid instrument in a local projections specification is not yet publicly released. See Bauer and Swanson (2023) for a discussion of instrument relevance and exogeneity conditions for each shock. Bauer and Swanson (2023) show that their orthogonalized measure produces estimates of larger magnitude and statistical significance than their conventional measure. The estimates in this paper are thus a lower bound of results.

[9]The first-stage F-statistic of the instrumental variable varies at each estimated horizon. The lowest F-statistic for the regression on industrial production is 13, unemployment rate is 22.4, income is 12.3, and total consumption is 10.5. The F-statistics in regressions of outcomes by gender and race also pass the Stock and Watson (2012) rule of thumb for a relevant instrument.

Figure 1: Effects of monetary policy shocks on aggregate variables

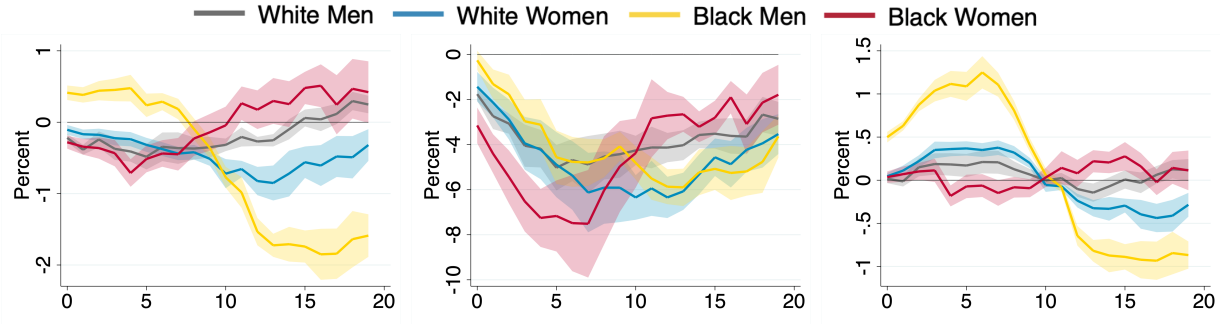


(a) Industrial Production (b) Unemployment Rate (c) Income (after tax)

(d) Total Consumption (e) Consumption Gap (NDS-D)

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on aggregate variables. Time (horizontal axis) is in quarters. Dark and light grey shaded areas represent one standard deviation and 90% confidence intervals respectively. Subfigure (e) plots the gap in consumption on different types of goods: non-durable goods and services (NDS) minus durable goods (D).

Figure 2: Effects of monetary policy shocks on household consumption



(a) Total (b) Durables (c) Non-durables & Services

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on household consumption, separately by households headed by white men, white women, black men, and black women. Sub-figures show consumption of (a) total goods, (b) durable goods, and (c) non-durable goods and services. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

icy shocks. Following a 25bp contractionary monetary policy shock, total spending is reduced by 1.9% by households headed by black men, while by 0.5% by households headed by white men. Households headed by women also decrease their spending more than households headed by white men. Figure 2a shows that black women decrease their consumption most initially, by 0.7% after 5 quarters, but then recover faster than other households. In contrast, households headed by white women decrease spending by at most 0.9% and recover slower than households headed by white men. Spending changes most for households headed by black women in the short-term, but for households headed by black men and white women in the long-term.

The different consumption responses by demographic groups also holds for separate categories of expenditures such as durable goods versus non-durable goods and services. In the first two years after a contractionary shock, households headed by black women decrease their consumption of durable goods by 7.5% and non-durable goods and services by 0.18%, more than other households. Durables spending reacts similarly for other households immediately after a shock, but is sustained below -4% for households headed by white women and black men in later quarters. Spending on non-durable goods and services initially rises for all households, except those headed by black women. However, three years after the shock, spending falls and is sustained at -0.9% for households headed by black men and -0.4% for households headed by white women.

I separately estimate the responses of types of non-durable goods and services to understand the positive response of many households to contractionary shocks. Table 2 shows the response of each subcategory of non-durables and services spending to a 25bp contractionary shock. Household spending is on average 60% on non-durables and 40% on services. However, households spend the most on food expenditures, which comprise 40% of all non-durables and services spending. The increase in food spending in Table 2 drives the overall increase in non-durables and services to contractionary shocks.

The estimates in Table 2 suggest that households substitute their consumption away from durables and non-essential non-durables to other non-durables and services following contractionary shocks. Most households reduce their non-essential spending on technology and entertainment goods, and transportation. Households instead increase their spending

Table 2: Effect of monetary policy shocks on categories of non-durable goods and services consumption

Outcome (%)	White Men	White Women	Black Men	Black Women
Non-durables	0.278	0.522	1.734	0.375
- Clothing and footwear	0.295	1.155	1.299	0.270
- Food	0.362	0.637	1.685	0.732
- House furnishings and items	-0.973	0.549	2.273	-2.252
- Technology and entertainment	-0.287	-0.361	0.442	-0.567
- Transportation	-0.070	-0.808	2.269	-0.477
Services	0.378	0.165	0.670	-0.746
- Care (child, elder, house, personal)	0.612	0.969	1.594	-1.693
- House utilities and maintenance	1.139	0.370	2.084	0.331
- Insurance	0.155	-0.108	1.270	-2.099
- Technology, education, and entertainment	0.455	1.016	1.258	-1.979
- Transportation	-1.810	-0.731	-0.843	-0.835

Note: The table shows the percent response of each expenditure category to a 25bp contractionary monetary shock at quarter 6.

on clothing, food, and services such as utilities, maintenance, technology, and entertainment. Increased spending on household services could reflect expenditures allocated to smaller-scale expenses that are used on a daily basis in the home.

There are also important differences by household gender and race in which categories of non-durables and services are reduced. Households headed by black women decrease their consumption of non-durables and services at a statistically significantly higher magnitude than other households. This is especially true for technology, entertainment, and education. However, these households also decrease their spending on household furnishings, insurance, and household care services statistically more than others. Combining these responses with those of durable goods, it is clear that households headed by black women decrease their consumption the most following a contractionary monetary policy shock.

4 Drivers of Consumption Response Gaps

I next investigate whether the gaps in responses in Figure 2 are driven by household characteristics other than gender and race. Mechanisms such as education, mortgage debt, income, and age have been proposed to explain heterogeneous responses to monetary policy. How-

ever, I find that these mechanisms neither fully explain the variation in consumption response to contractionary policy, nor the gender and racial differences in responses. Differences in responses are in part explained by labor market outcomes and spousal insurance. The following analysis is focused on the response of durable goods to contractionary shocks given that it is large in magnitude and drives the fall in total consumption.[10]

4.1 Conventional Mechanisms

Do conventional mechanisms of monetary policy shock transmission to consumption also explain gender and racial differences in consumption responses? If, for example, gender and racial consumption gaps were solely driven by education inequality, these gaps would not exist within subgroups by educational attainment. However, I find that these gender and racial gaps persist even when accounting for household characteristics that could theoretically drive the gaps between groups. Figure 3 shows that spending continues to be decreased more by black than white households regardless of these mechanisms. This result is consistent with the racial consumption gaps found in Ganong et al. (2020).

I begin by estimating consumption responses to monetary policy separately for households by their head's educational attainment. The durables consumption of all households without a college degree responds more to contractionary shocks than of households with a college degree. However, Figure 3 shows that racial gaps are prominent among households with college education. Among the college-educated, consumption falls by almost twice the magnitude for households headed by black women than others. Additionally, households headed by black men and white women have persistently lower consumption than other groups regardless of educational attainment.

Household mortgage debt also does not explain the gender and racial consumption gaps from Figure 2. To measure the debt burden channel of monetary policy, I separate households by whether they have a mortgage on their house, own their house, or rent. Households with mortgages decrease their spending the most compared to owners and renters, consistent with Cloyne et al. (2020). However, racial and gender gaps in consumption responses

[10]See Appendix C for the responses of household consumption of non-durable goods and services by subgroups.

persist within these debt categories. Black women-led households drive the fall in mortgagor spending on durable goods in Figure 3. Also, owner and renter households headed by black men decrease their durables consumption more than white households. The debt burden channel therefore also restricts the consumption of black renter households.

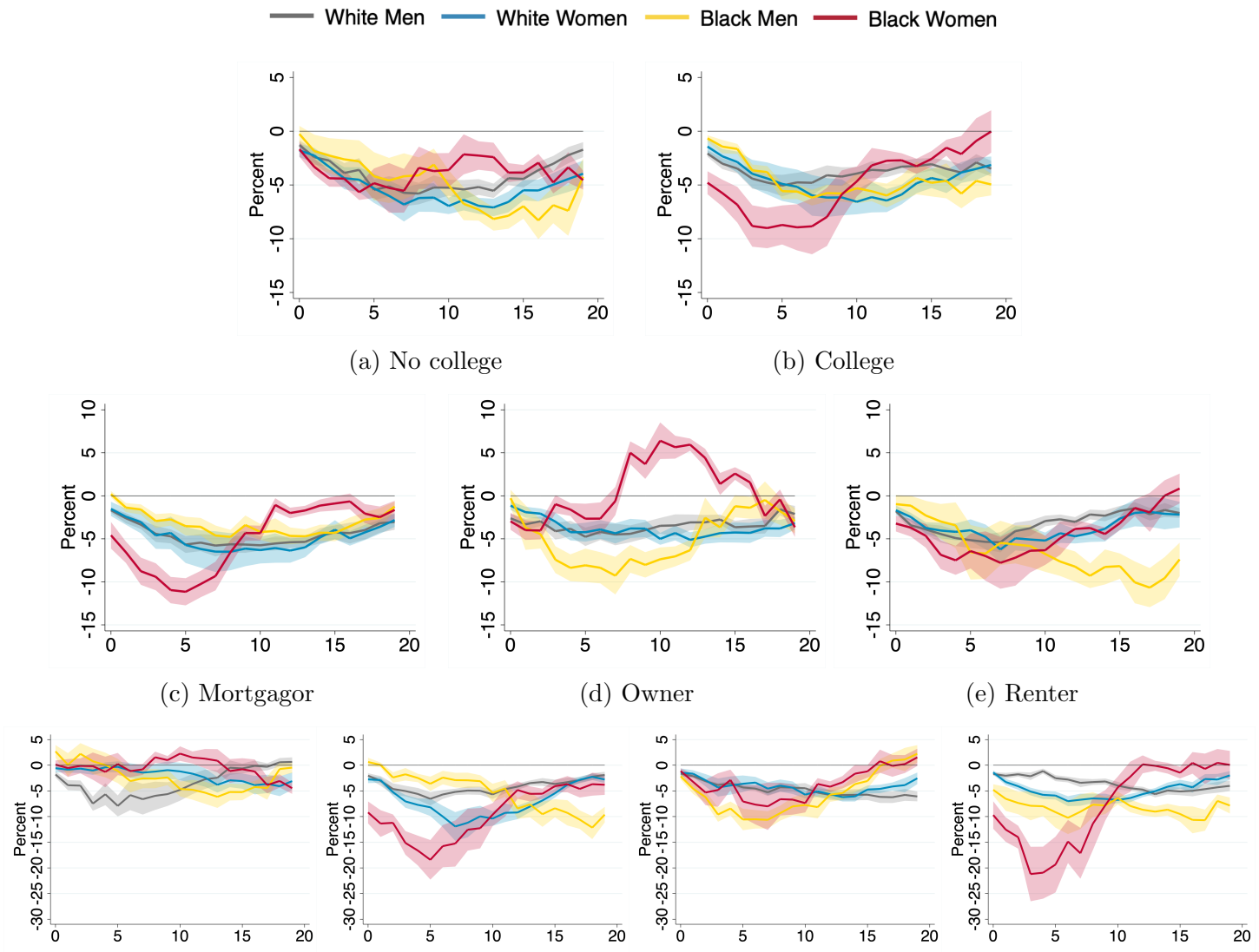
Gender and racial consumption gaps additionally persist within different levels of family income.[11] The response of durables to contractionary shocks is greatest for low income households for households headed by white men. However, this is not always the case for other demographic groups. Black households reduce their spending in response to monetary shocks at all ranges of the income distribution. For example, the consumption of households headed by black women falls by over 15% for those in the 20-40th and 60-80th income percentiles.

The age of the head of household additionally does not drive gender and racial consumption gaps.[12] There is no clear trend between younger versus older households as in Leahy and Thapar (2022) or Wong (2015). Instead, consumption gaps in Figure 2 are maintained across age bands, consistent with Cloyne et al. (2020). Black households consistently decrease their durable goods consumption more than other groups in every age band.

[11]Family income percentile thresholds are the same for all gender and racial groups. These results hold when using a measure of household labor earnings instead of total income. I also find similar gaps when disaggregating households by their savings and wealth. Estimates are available upon request.

[12]See Appendix D for the impulse responses of consumption by age band.

Figure 3: Effects of monetary policy shocks on durable goods consumption by education and finances



(a) No college (b) College

(c) Mortgagor (d) Owner (e) Renter

(f) Income 0-20% (g) Income 20-40% (h) Income 40-60% (i) Income 60-80%

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on household consumption of durable goods, separately by households headed by white men, white women, black men, and black women. Each row displays different breakdowns of the total sample. Sub-figures compare households whose heads (a) do not have a college degree vs (b) have a college degree, (c) mortgage vs (d) own vs (e) rent their home, and (f-i) quintiles of the family income distribution. The highest quintile of income is not displayed due to limited data. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

Geographical location is also important to consider, as monetary policy's effects on inequality vary by the share of each demographic group in that region (Seguino and Heintz 2012). I estimate that consumption reacts more to monetary shocks for black than white households regardless of location. I also find that black households decrease their consumption most in rural areas and in places that are most exposed to shocks.[13]

These results demonstrate that monetary policy does not influence consumption to the same degree for all demographic groups. Additionally, gender and racial consumption gaps are not fully understood with conventional mechanisms for monetary policy transmission. To further explore the contribution of the analysis by household gender and race, I conduct two variance decomposition exercises of consumption. The first examines the unconditional contribution of gender and race to household consumption, while the second estimates this contribution to consumption conditional on the response to monetary policy shocks. I find that gender and race does matter for understanding the conditional response of consumption to monetary policy shocks.

Analysis by gender and race can explain part of the variation in household consumption further than the variation explained by household finances. As evidence of the additional contribution of gender and race, I first decompose the variation in consumption into its common (aggregate) and group-specific components.[14] I find that gender and race controls explain over 2% of the variance unexplained by the aggregate component. Income is the largest contributor to the unexplained variance from the aggregate component; explaining about 13%. College education and mortgagor status each contribute 5%, while marital status and age contribute less than 1% to the unexplained variance.

The second variance decomposition exercise is an analysis of which mechanisms explain the variation in the consumption response to monetary policy shocks for all households. The variation in the response of all households is decomposed into components explained by each mechanism of household heterogeneity.[15] I find that four quarters after the shock, race

[13]See Appendix E for the impulse responses of consumption by geographical location.

[14]The variance decomposition is estimated in a two-stage regression of households over quarters of time. In the first stage, the aggregate component is calculated by regressing the log of consumption on time dummies. The second stage regresses the residuals from the first stage on each group control. The variation is given by the R^2 estimates from each regression.

[15]The total variance in the response of durables is computed from equation 1 as in Figure 1. The effect

and gender explain 75.3% of the variance of all households, income explains 67.8%, marital status explains 21%, mortgagor status or age explain 15%, and education explains 5.6%. Race and gender continue to explain a large share of variation in quarter 6, second only to income.[16] It is therefore important to estimate consumption responses to monetary policy shocks separately by groups to fully understand the variation in responses.

Since conventional monetary policy transmission mechanisms do not fully explain the variation in consumption responses, I next explore other mechanisms that could drive the differences in consumption responses by gender and race. The following sections investigate how labor market and income outcomes determine households' abilities to spend when there is an unexpected change in monetary policy. Black households are more likely to be credit constrained, and thus are expected to decrease their spending most due to disproportionate job and income losses.

4.2 The Labor Market and Spousal Insurance

I analyze how labor market dynamics and household composition impact the transmission of monetary policy to consumption. I first estimate differences in consumption responses to contractionary shocks between households by their marital status. It is important to consider household composition because the responses of single households more closely identify that individual's preferences, while the responses of married households may be a joint decision between spouses given shared responsibilities or divisions of paid and unpaid work. Figure 4 shows that the durable consumption responses to contractionary monetary shocks are similar for married households, but differ by gender and race for single households.[17]

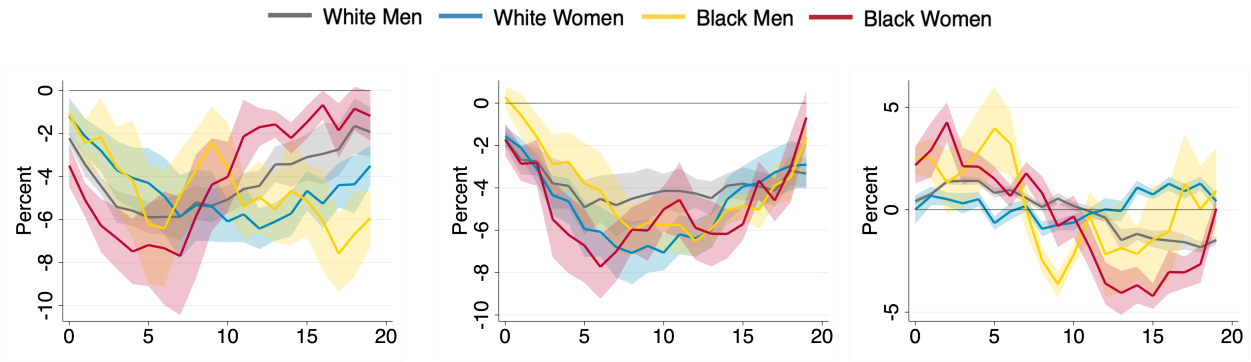
Single households represent the effects of monetary policy on individuals. These drive

of monetary policy shocks on consumption is next estimated separately for each household group: race and gender; education; mortgagor status; income percentile; marital status; and age. The total variance of all households is then decomposed into the portion explained by the response of each demographic group.

[16]Since these demographic groups are correlated, the sum of variances is larger than the total variance for all households. When households are separated by race and gender in addition to each group, a considerably larger share of variance is explained. This suggests that the pooled estimate of the response of consumption for all households likely understates the variance in consumption responses between groups.

[17]The results by marriage status are consistent with households separated by the number of income earners. Earners are either the head of the household or the spouse. Households who have one (two) income earner have similar responses as those who are single (married). However, income earners fluctuate within households and the CE interviews households for short periods. The results by income earners are therefore more difficult to interpret than those by marital status, which more often stays constant over time.

Figure 4: Effects of monetary policy shocks on durable goods consumption by marital status



(a) Single (b) Married (c) Gap (Married-Single)

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on household consumption of durable goods, separately by households headed by white men, white women, black men, and black women. Sub-figures compare households by marital status. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

the overall result that households headed by black women decrease their consumption most in response to contractionary shocks within the first year. In the first two years after a contractionary shock, consumption falls by 7.7% for single households headed by black women and by 6.5% or less for other single households.

The consumption of married households responds differently than that of single households in two ways. First, the consumption responses of all married households are similar by gender and race. Second, shocks impact the consumption of married households less than of single households. Figure 4c shows the gap in consumption responses between married and single households, which is positive in the first two years after the shock for all households.

The fact that there are no gender and racial differences in the consumption responses of married households suggests that households with two spouses mitigate inequities by gender and race. This could be driven by consumption smoothing mechanisms in married households, allowing households with two spouses to self-insure their consumption against income shocks better than those with a single earner.

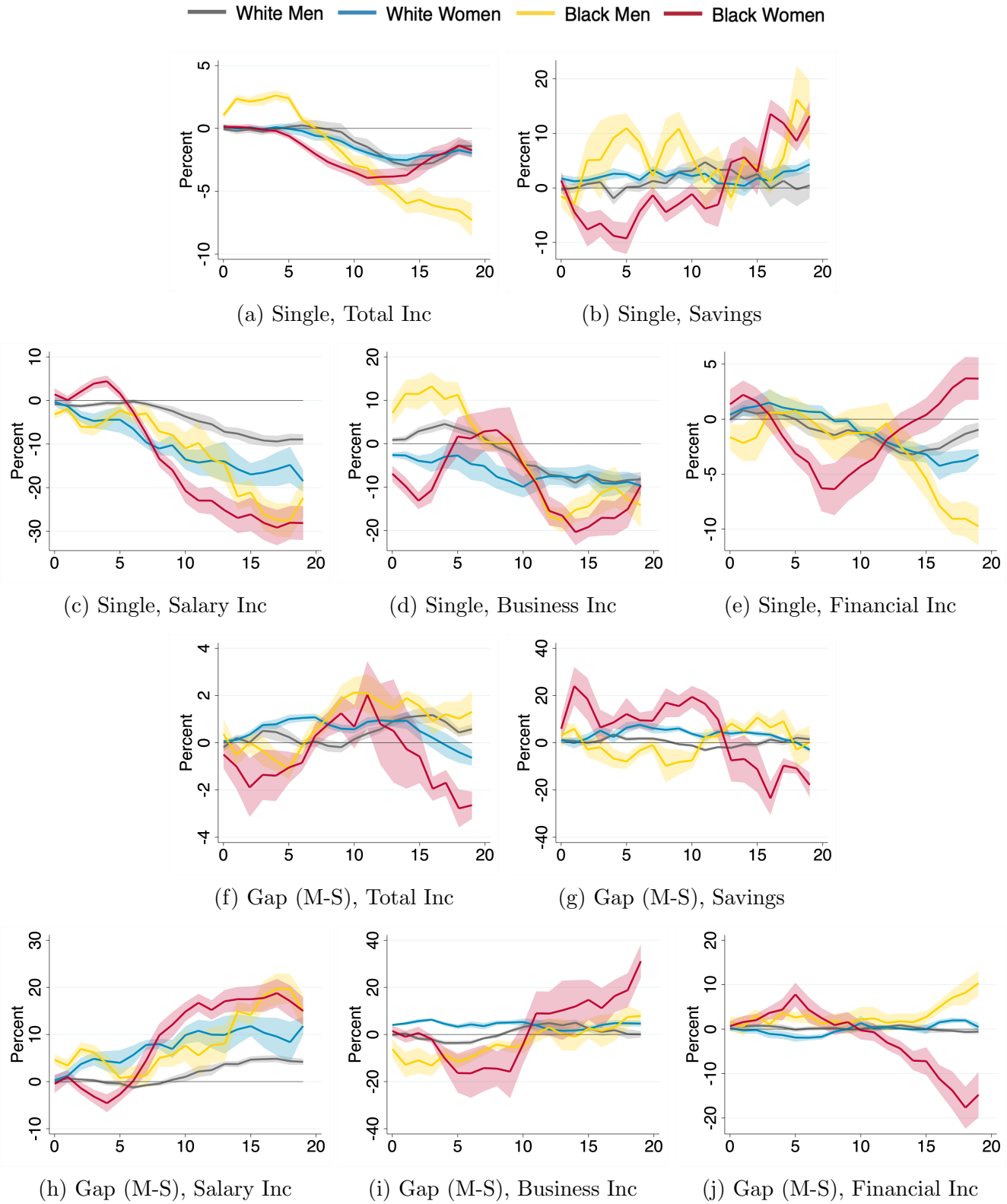
I find evidence of spousal insurance against income fluctuations following monetary policy shocks. The first two rows in Figure 5 show that a 25bp contractionary shock leads total income, salary income, and business income to fall for most single households. However, the

last two rows of Figure 5 show that married household incomes fall less than single household incomes in response to a contractionary shock. Following spousal insurance theory, married household income will fluctuate less than individual spouse incomes (Browning et al. 2014). Since contractionary shocks decrease total incomes less for married than single households, it naturally follows that consumption of married households would also fall less.

Gains in non-labor income can offset losses in the labor market and support household consumption smoothing. Business incomes rise for households headed by men, but fall for households headed by women in the first two years after a contractionary shock. Financial incomes rise within the first year after the shock and then decline especially for households headed by black women. Similarly, savings balances rise for most single households, but they fall for households headed by black women following a shock. Financial income and savings also rise more for married than single households. The fact that business and financial incomes comprise a larger share of total income for white than black households can explain the racial differences in consumption responses. Higher financial income and savings additionally aid white households and married households in smoothing consumption alongside falls in salary incomes.

The breakdown of income sources in Figure 5 shows that the composition of household income can influence the response of consumption to monetary shocks. However, the responses of all financial measures to contractionary shocks fluctuate more for black than white households. My estimates therefore suggest that reductions in consumption due to contractionary shocks are driven by falling incomes and savings.

Figure 5: Effects of monetary policy shocks on finances by marital status



(a) Single, Total Inc

(b) Single, Savings

(c) Single, Salary Inc

(d) Single, Business Inc

(e) Single, Financial Inc

(f) Gap (M-S), Total Inc

(g) Gap (M-S), Savings

(h) Gap (M-S), Salary Inc

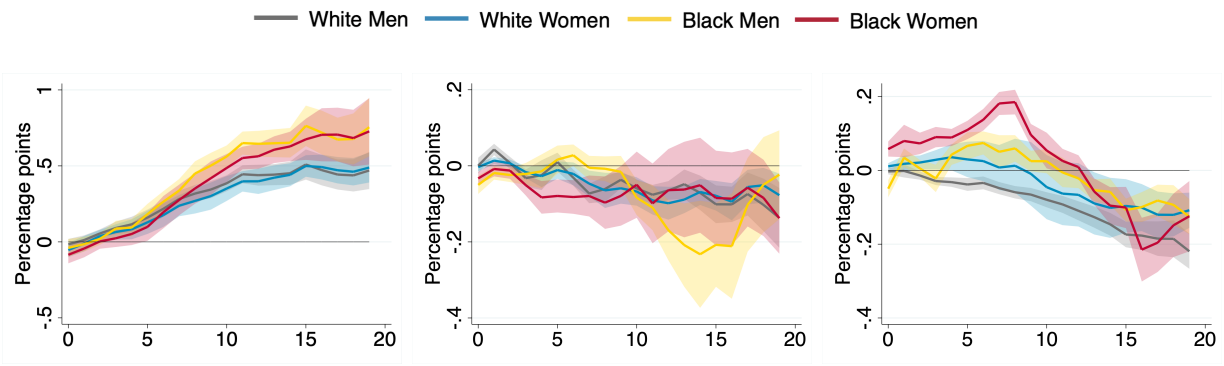
(i) Gap (M-S), Business Inc

(j) Gap (M-S), Financial Inc

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on household income and savings, separately by households headed by white men, white women, black men, and black women. Total income is divided into salary, business, and financial income. Sub-figures a-e show estimates for single households and sub-figures f-j show the gap between married and single households. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

I estimate the effect of monetary shocks on labor market outcomes to further disentangle the gaps in income responses by household marital status. Figure 6a shows that the unemployment rate rises for all groups following a 25bp contractionary monetary policy shock. However, the unemployment rate rises higher for black than white individuals.[18] The widening of the racial unemployment gap likely drives the widening racial gap in salary incomes from Figure 5c.

Figure 6: Effects of monetary policy shocks on labor market outcomes



(a) Unemployment rate (b) LFP rate, Single (c) LFP rate, Married

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on labor market outcomes, separately by households headed by white men, white women, black men, and black women. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

Alongside changes in unemployment, individuals adjust their participation in the labor force (LFP). Figure 6b shows that the LFP falls for all single individuals to a peak of -0.1pp following a 25bp contractionary shock. The LFP for married white men similarly falls in Figure 6c. However, the LFP for other married individuals rises; for example by 0.19pp for black women. This result supports the added income earner effect that married individuals

[18] I investigate whether occupational concentration drives racial differences in unemployment responses, since Duzhak (2021) finds that it does following downturns. Appendix F shows that monetary policy shocks impact employment in industry more than in services, consistent with Flamini et al. (2023). Changes in industry employment are driven by the construction sector. Changes in services employment are driven by utilities, wholesale and retail trade, and real estate sectors. Black employee concentration in wholesale and retail trade and service jobs and non-white employee concentration in construction drives the racial gap in unemployment responses. Men's concentration in industry jobs drives any gender gaps. However, sector exposure does not fully explain the gaps because I find racial and gender gaps within the responses of many sectors. For example, the first row in Appendix Table F.1 shows that black employment falls more in construction than white employment following a contractionary shock. The component of the unemployment response that is unexplained by occupational concentration calls for further investigation into labor market inequalities.

enter the labor force to support their households during times of unemployment.[19] Black income earners experience higher unemployment rates following contractionary shocks, and thus their spouses have higher LFP in this period. Therefore, the responses of labor market outcomes to monetary policy shocks also support the theory of spousal insurance.

Labor market responses can influence gender differences in household consumption responses to monetary policy. Following contractionary shocks, married women are more likely to enter the labor force and be the added income earner in the household (see Figure 6c). Women heads of household tend to have spouses that are retired or disabled, and thus less likely to enter the labor force during a shock. Households headed by men in which the man is the income earner therefore have more access to the spousal insurance mechanism in the labor market. This is reflected in the lower drop in consumption of households headed by men than women following a contractionary shock in Figure 4b.

The stark differences in marital status for households by gender and race in part drive household consumption inequality. Households headed by black women are especially disadvantaged in relation to spousal insurance since they are more often single households. This likely drives households headed by black women to cut spending on non-durable goods and services in addition to durable goods following contractionary shocks. Black women especially decrease their expenditures on care services such as childcare, eldercare, housekeeping, and personal care. These women thus take on additional unpaid family work.[20]

The estimated impact of contractionary shocks on single household outcomes demonstrate the heterogeneity in the transmission of monetary policy to individuals. Clearly, black women and men disproportionately experience negative outcomes following contractionary shocks that constrain their household spending. These include higher unemployment rates, falls in all types of incomes, and falls in savings.

[19] I confirm that individuals who enter the labor force become employed rather than unemployed. I estimate the impact of a 25bp contractionary shock on the ratio of employment to the total population and find that this employment ratio generally falls following a contractionary shock. However, the employment ratio rises by 0.18pp for black women and by 0.04pp for white women. These are almost the same magnitudes as the rise in LFP rate in Figure 6c.

[20] Women tend to bear the majority of the house and care work in married households, even in households where both spouses are employed (Thébaud 2010).

5 The MPC

In this section, I calculate the marginal propensity to consume (MPC) for households in response to a contractionary monetary policy shock. The MPC is the dollar ratio of the peak cumulative change in consumption (total, durable goods, or non-durable goods and services) out of the peak cumulative change in income (total or salary) following a 25bp contractionary shock. The peak cumulative responses of consumption and income, shown in the first two groups of Table 3, are the same as those shown in Figures 1, 2, and for the overall sample instead of Figure 5. I convert the percent changes to dollar amounts by multiplying the percentages by average household spending from Table 1.

Table 3: MPC out of monetary policy shocks

	All	White Men	White Women	Black Men	Black Women
Δ Consumption (%)					
- Total	-0.532	-0.484	-0.851	-1.850	-0.711
- Durables	-4.952	-5.027	-6.347	-5.899	-7.514
- Non-durables & Services	-0.287	-0.144	-0.438	-0.934	-0.182
Δ Income (%)					
- Total	-2.742	-2.195	-2.791	-6.276	-4.329
- Salary	-8.190	-6.398	-10.965	-13.434	-23.753
MPC, total income					
- Total	0.033	0.033	0.056	0.049	0.036
- Durables	0.045	0.054	0.060	0.022	0.049
- Non-durables & Services	0.015	0.008	0.025	0.021	0.008
MPC, salary income					
- Total	0.015	0.015	0.025	0.030	0.012
- Durables	0.021	0.024	0.027	0.013	0.016
- Non-durables & Services	0.007	0.004	0.011	0.013	0.003

Note: The table shows consumption, income, and MPC responses to monetary policy for all households and those separated by gender and race. The first two panels display the peak response of consumption and income to a 25bp contractionary monetary shock. The second two panels display the MPC (dollar Δ Consumption / dollar Δ Income) out of changes in total or salary income for each expenditure type.

Average MPCs following contractionary shocks are below 6% for all household groups and are highest out of durable consumption and total income. The MPC out of total changes

in consumption and income following a 25bp contractionary shock is on average 3.3%, as shown in the first column of Table 3. The MPC out of total income is 4.5% for changes in durable goods, while 1.5% for changes in non-durable goods and services. The MPC out of salary income is half the size of the MPC out of total income. This is due to the larger negative response of salary income to a contractionary shock. MPCs out of larger changes in income are smaller, in line with Colarieti et al. (2024) and others.

Table 3 also presents the MPCs out of contractionary shocks for households separated by gender and race. The MPCs are similar in magnitude, however, they are not directly comparable since the MPC of each group is calculated out of a different change in income. Black households have the largest peak responses of consumption to contractionary shocks. However, they also experience the largest peak responses of income. The MPCs of black households are therefore calculated out of larger changes in income. It follows that average MPCs out of this monetary policy shock would be smaller for black than white households. The fact that average MPCs are the same magnitude or larger in certain cases for black households shows that black households reduce their consumption at large rates.

6 Robustness

I conduct several additional robustness checks to verify the results in section 3. I first test for the sensitivity of the results to the monetary policy shock specification. I substitute the instrument in equation (1) for the Jarocinski and Karadi (2020) monetary policy shock series. I follow Jarocinski and Karadi (2020) in using the shock series to instrument the mean quarterly 1-year Treasury yield to ensure a strong instrument in the regression. As a second alternative specification, I instrument the Wu and Xia (2016) shadow rate series with the Bauer and Swanson (2023) monetary policy shock in equation 1. I aggregate the shadow rate series to a quarterly frequency by the sum of all shocks within the quarter. Both alternative specifications are estimated starting in 1990 due to data availability. Appendix G displays the response of gender and racial gaps in consumption, unemployment, and income for the estimates of the baseline and two alternative specifications. The estimates of the baseline and alternatives are consistent in direction, magnitude, and statistical significance.

I then check whether the results are affected by different specifications of equation 1 such

as OLS, lag lengths, and controls. I confirm that the main results using local projections-instrumental variables are consistent with local projections-OLS. The main results are also similar up to five lags; including controls and shocks with six or more lags distorts the results. Using less than five lags is consistent with the local projections literature. I next test for the importance of the vector of controls Z in equation (1) by running the local projections without this vector. The majority of results are consistent. However, it is important to include all Z controls in the estimation to separate out the effects of macroeconomic conditions. Omitting all or some of the controls likely produces incorrect estimates.

I also verify that the consumption results are similar for different periods. I separate the sample pre- and post-2001 and 2008 to study recessions and whether using shocks only from the unconventional monetary policy period affect the estimates. I find that the results for the full sample are qualitatively consistent with those using data pre-2001, pre-2008, or post-2008. Consumption of all goods and durable goods falls more for black than white households.

6.1 Monetary Policy Asymmetry

I additionally test for various forms of asymmetry in the transmission of monetary policy. There is much evidence in the literature (see Furceri et al. (2018), Jordà et al. (2020), Kloosterman et al. (2024) and references cited therein) that the effects of monetary policy shocks are weaker in periods of low inflation and low growth, and that responses are weaker to expansionary versus contractionary shocks. I first test the possible state dependence of the impulse response functions. I differentiate between periods of high and low inflation and economic booms and slumps. Next, I test the asymmetry in the direction of the monetary policy shock; positive (contractionary) versus negative (expansionary). I run local projections for each demographic group, including an indicator for each state of the economy. The below equation is estimated:

$$x_{g,t+h} = \alpha_{g,h} + \psi_{g,h}(L)Z_{t-1} + \beta_{g,h}Y_t^{2y}D_t + \beta_{g,h}Y_t^{2y}(1-D_t) + \varepsilon_{g,t+h} \quad \text{for} \quad h = 0, ..., H-1\,, \tag{2}$$

where all variables are specified as in equation 1 and D is the indicator. The interaction of the 2-year Treasury yield and D is instrumented with the interaction of the high-frequency monetary policy surprise measure and D.

The first test of state dependence is on inflationary periods. I follow Jordà et al. (2020) in constructing variable D as a dummy that equals one when the economy is in low inflation (at or below 2%) and zero in high inflation. I normalize the monetary policy shock in each period to be a 25bp rate hike. Figure 7a displays the difference in durable goods consumption responses to a contractionary shock between each inflation period. The difference is calculated as the absolute value of estimates for low inflation minus the absolute value of estimates for high inflation. This difference is negative for all households, meaning that households decrease their consumption more in high than low inflation periods following a contractionary shock. The consumption responses are also significantly different between inflation periods for all households. Contractionary policy therefore has a larger negative impact on consumption during high inflation periods.

Figure 7: Difference in consumption responses to monetary policy shocks by state and shock sign

(a) Low/high inflation (b) Slump/boom (c) +/- shocks

Note: The figure shows differences in durable goods consumption responses to monetary policy shocks, separately by households headed by white men, white women, black men, and black women. Subfigures a and b show the effect of a 25bp contractionary shock on the absolute value consumption responses for low inflation (≤2%) minus high inflation (>2%) and for slumps (recessions) minus booms (non-recessions). Subfigure c shows the difference in consumption responses to a 25bp contractionary (+) versus expansionary (-) monetary policy shock. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

The second test of state dependence is on economic slumps and booms. I follow Jordà

et al. (2020) in setting the indicator variable equal to one in an economic recession (slump) and zero otherwise. Also, in normalizing the shock in each state to be a 25bp contractionary shock. I calculate the difference between states as the absolute value of estimates for slumps minus the absolute value of estimates for booms. Figure 7b shows that consumption responses do not clearly vary between economic states for white households. However, households headed by black women experience a 5.9pp larger fall in durables consumption in a boom than in a slump three years after a 25bp contractionary shock.

Lastly, I estimate whether monetary policy shocks have asymmetric effects on consumption by the direction of the shock. I set D to one if the shock is contractionary (positive) and to zero otherwise as in Furceri et al. (2018). For these estimates, the shocks are each scaled to be 25bp. Durables consumption falls in response to contractionary shocks and rises in response to expansionary shocks. The difference in consumption responses to contractionary versus expansionary monetary policy shocks is statistically significant for all households. Figure 7c shows that consumption falls more in response to contractionary shocks than it rises in response to expansionary shocks. Consumption falls by a peak of 8.6pp, 4.7pp, and 2.5pp more during contractionary than expansionary shocks for households headed by black women, white men and women, and black men respectively. The estimates in section 3.1 are therefore driven by contractionary rather than expansionary shocks.

Figure 7 also shows that the magnitude of the asymmetric transmission of shocks in each state differs by household group. The durables consumption of households headed by black women responds most in either state and to either shock sign, although with varying levels of statistical significance.

7 Conclusion

This paper is the first to estimate gender and racial gaps in household consumption responses to monetary policy shocks with this methodology and extended time period, as far as I know. It is also novel in explaining consumption responses through estimated impacts on labor market and income outcomes such as with spousal insurance. Consumption behaviors are influenced by total disposable income, which in turn is determined by access to education, employment, and financial opportunities. These other forms of inequality, which are more

often faced by people of color and women, are masked by measures of income inequality. Since income gaps obscure these other inequalities that affect how monetary policy is transmitted, focusing solely on income inequality has limited previous research.

I fill this gap in the literature by separately studying the consumption responses of households headed by white men, white women, black men, and black women while accounting for various household characteristics. The results show that falls in consumption following contractionary monetary policy shocks are associated with rising unemployment rates and falling incomes. However, black households experience the largest negative effects of contractionary shocks. Neither household education, balance sheets, nor income explain gender and racial consumption gaps. Lastly, I find evidence that contractionary monetary policy shocks widen inequalities that are not reversed by expansionary shocks.

The findings in this paper are relevant for central bankers who might set interest rate policy to affect household spending. Policymakers must understand the determinants of aggregate outcomes. Also, how responses differ between positive and negative rate shocks to know whether monetary policy changes are having their intended effects.

More research is needed to understand how monetary policy affects consumption inequality by gender and race. This paper provides a holistic understanding of the interaction of these inequalities with conventional channels of monetary policy transmission. However, households headed by black women are still disproportionately impacted by policy shocks within each of these channels. A study could investigate the contribution of each channel with microeconomic data.

Additional efforts are also needed to incorporate gender and racial heterogeneity into models of monetary policy. My empirical estimates can inform model parameters to reflect heterogeneity in labor market outcomes, income, consumption, and MPCs. The results also provide motivation for quantitative models to explore non-linearities in monetary policy shocks, especially when studying expansionary policy.

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A Appendix: CE Data Cleaning

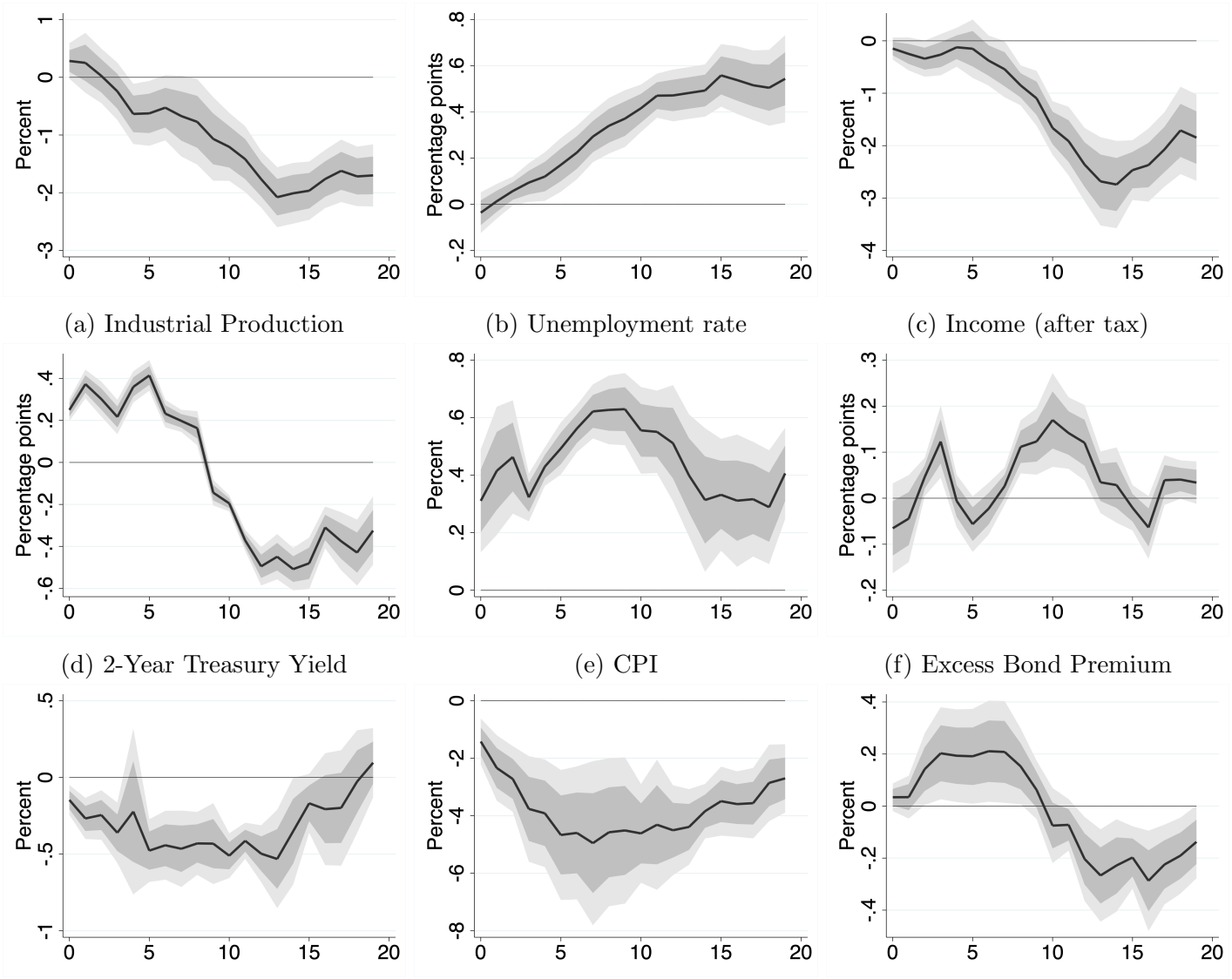
This section describes the data cleaning process for the Consumer Expenditure Survey (CE). The CE raw data files are available for download on the Bureau of Labor Statistics website. The expenditures data is aggregated from the MTAB files and the income data is constructed from the FMLI and MEMI files.

To create a quarterly expenditure series, expenditures are aggregated across months within the reported quarter. Observations are dropped if they report negative consumption on durable or non-durable goods and services. They are also dropped if they report negative net income data. I adjust for outliers by dropping households in the top or bottom 1% of expenditures in each quarter. This deletes about 3% of households. Since I am interested in studying how mortgage debt affects consumption, I also drop households that change their mortgage debt status during the year they are interviewed, following Cloyne et al. (2020). I only keep households whose head identifies as white or black race, given the small percentage of other racial groups in the sample. Following Cloyne et al. (2020), I also drop households whose heads are below 25 or over 75 years old, and keep households that were interviewed less than for their full survey period.

Categorization of consumption and income from the MTAB and MEMI CE files follows the classifications in Coibion et al. (2017). Data prior to 2004 are imputed according to Coibion et al. (2017) to account for CE imputations post-2004. Sample breaks and bracketed income values are also handled according to Coibion et al. (2017). The data are seasonally adjusted using a four quarter moving average.

For comparability over time, expenditure and income variables are deflated by the CPI to 2019 prices. To control for differences in household size, I adjust expenditures by the OECD scale of effective household size following Coibion et al. (2017). All series are thus in real and per capita values. I additionally weight the series by the CE household weights.

B Appendix: Effects of monetary policy shocks on macroeconomic aggregates



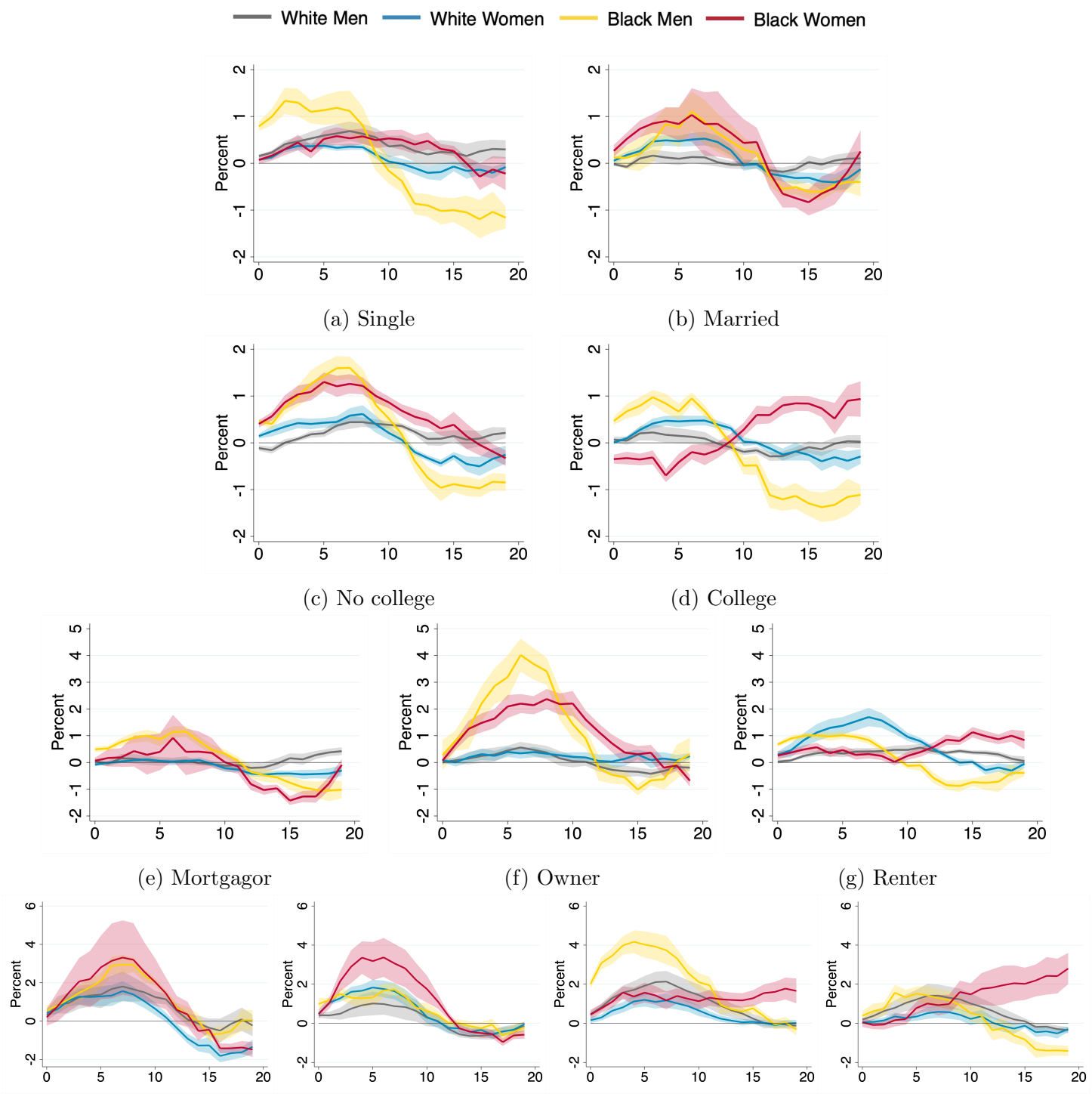
(a) Industrial Production (b) Unemployment rate (c) Income (after tax)

(d) 2-Year Treasury Yield (e) CPI (f) Excess Bond Premium

(g) Total Consumption (h) Durables (i) Non-durables & Services

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on aggregate variables. Time (horizontal axis) is in quarters. Dark and light grey shaded areas represent one standard deviation and 90% confidence intervals respectively.

C Appendix: Effects of monetary policy shocks on non-durable goods and services consumption by subgroups



(a) Single (b) Married

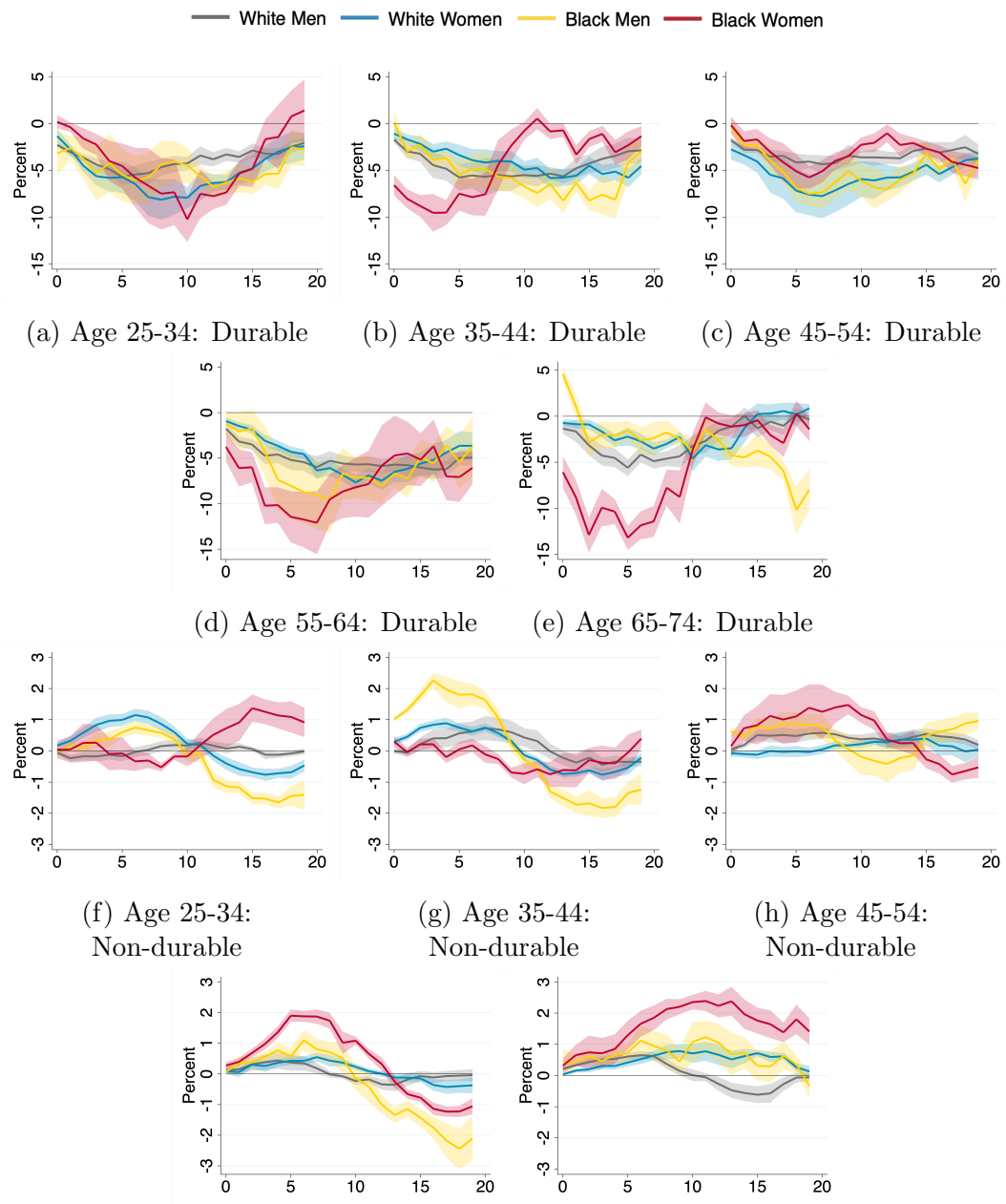
(c) No college (d) College

(e) Mortgagor (f) Owner (g) Renter

(h) Income 0-20% (i) Income 20-40% (j) Income 40-60% (k) Income 60-80%

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on household consumption of non-durable goods and services, separately by households headed by white men, white women, black men, and black women. Each row displays different breakdowns of the total sample. Sub-figures compare households whose heads are (a) single versus (b) married, (c) do not have a college degree vs (d) have a college degree, (e) mortgage vs (f) own vs (g) rent their home, and (h-k) quintiles of the family income distribution (excluding the highest quintile due to limited data). Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

D Appendix: Effects of monetary policy shocks on consumption by age



(a) Age 25-34: Durable (b) Age 35-44: Durable (c) Age 45-54: Durable

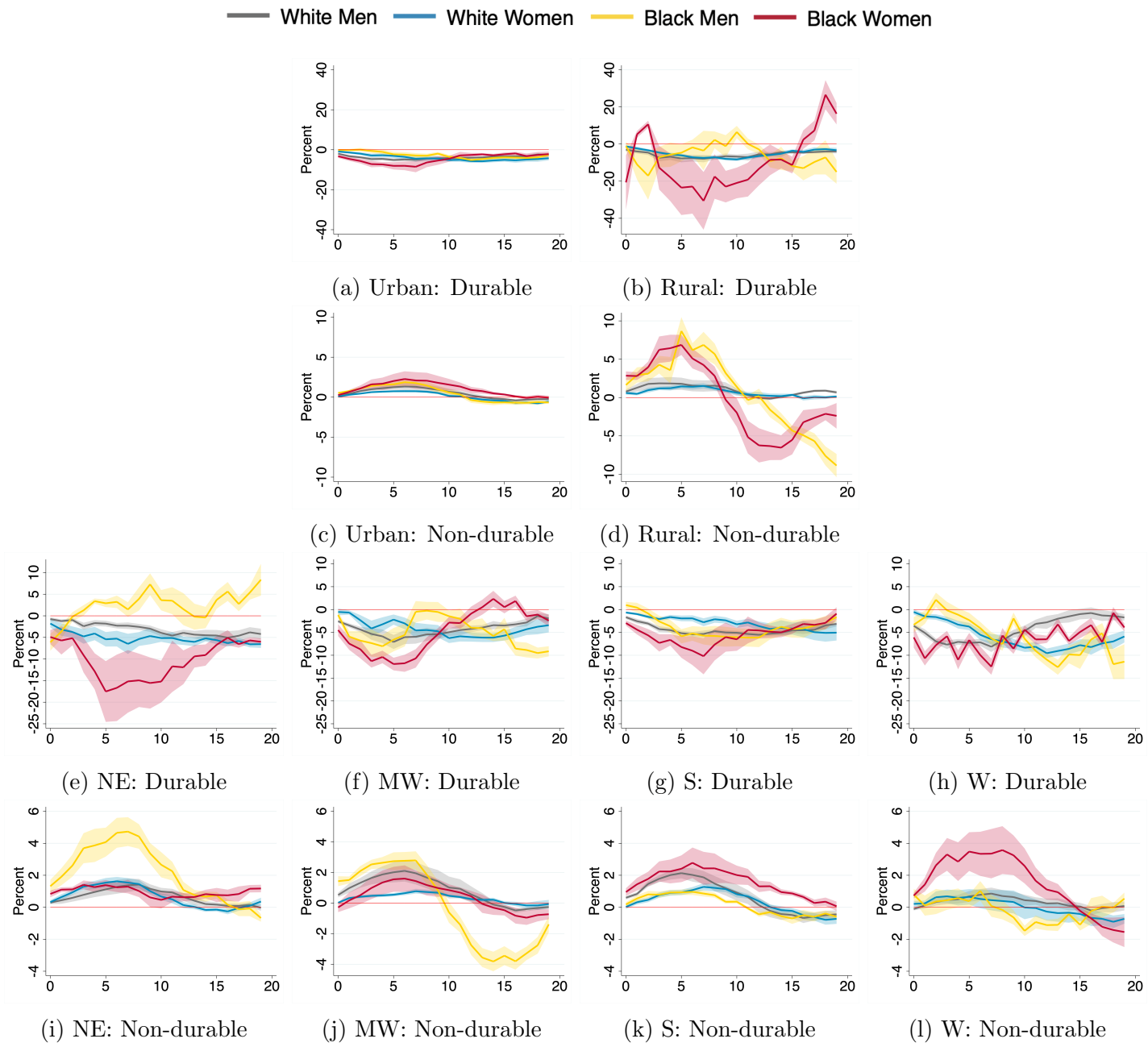
(d) Age 55-64: Durable (e) Age 65-74: Durable

(f) Age 25-34: Non-durable (g) Age 35-44: Non-durable (h) Age 45-54: Non-durable

(i) Age 55-64: Non-durable (j) Age 65-74: Non-durable

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on log consumption by the age of the head of household. The first two rows show responses of consumption of durable goods while the last two rows of non-durable goods and services. Each figure corresponds to households within a different age band. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

E Appendix: Effects of monetary policy shocks on consumption by geography



(a) Urban: Durable (b) Rural: Durable

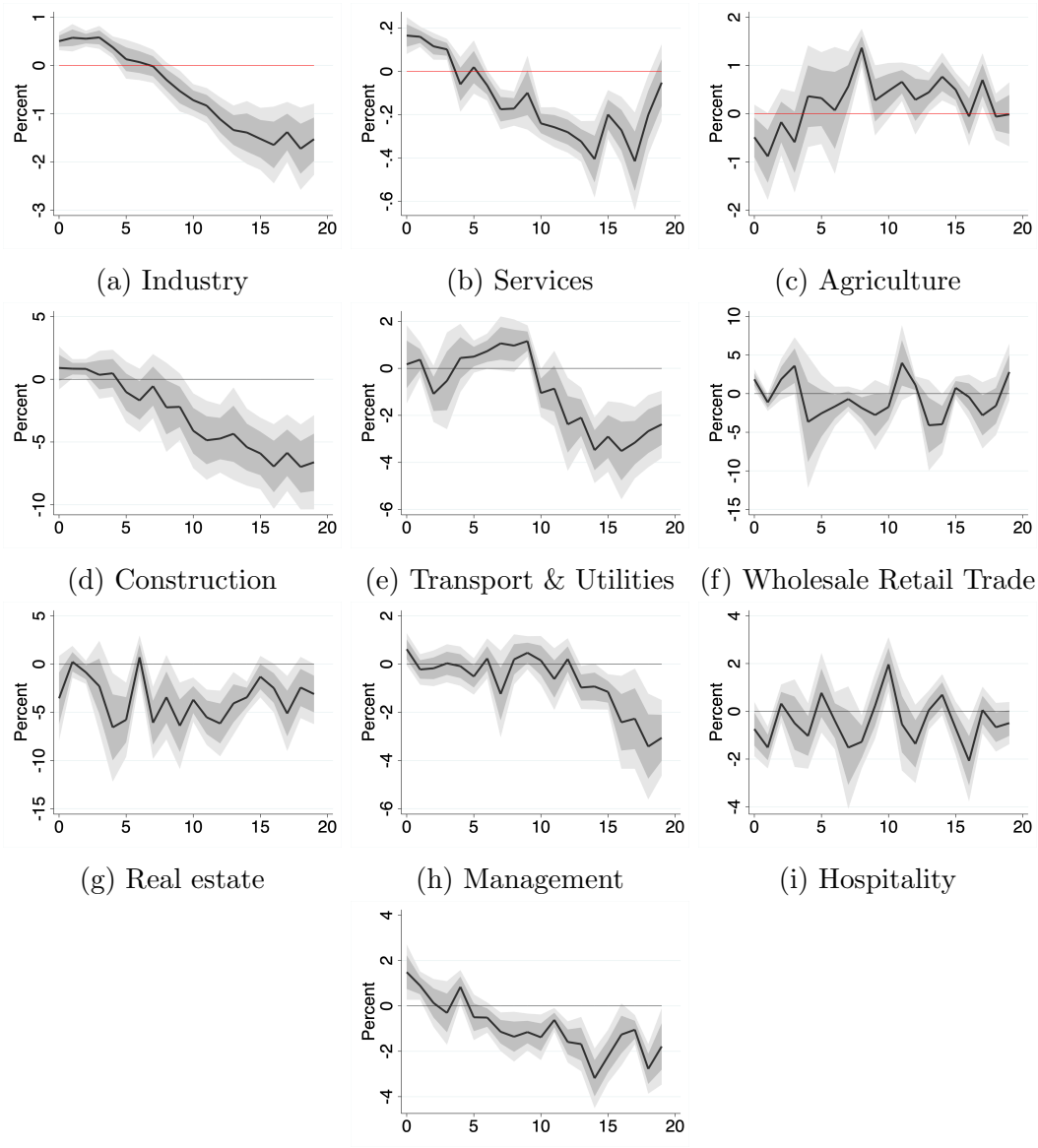
(c) Urban: Non-durable (d) Rural: Non-durable

(e) NE: Durable (f) MW: Durable (g) S: Durable (h) W: Durable

(i) NE: Non-durable (j) MW: Non-durable (k) S: Non-durable (l) W: Non-durable

Note: The figure shows the effects of a 25bp contractionary monetary policy shock on log consumption by geographical location of household. The first and third rows show responses of consumption of durable goods while the second and fourth rows of non-durable goods and services. The first two rows split the sample between urban and rural households. Sub-figures e-l show estimates for households located in the North-East (NE), Mid-West (MW), South (S), and West (W) of the U.S. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

F Appendix: Effects of monetary policy shocks on employment by sector



(a) Industry (b) Services (c) Agriculture

(d) Construction (e) Transport & Utilities (f) Wholesale Retail Trade

(g) Real estate (h) Management (i) Hospitality

(j) Other services

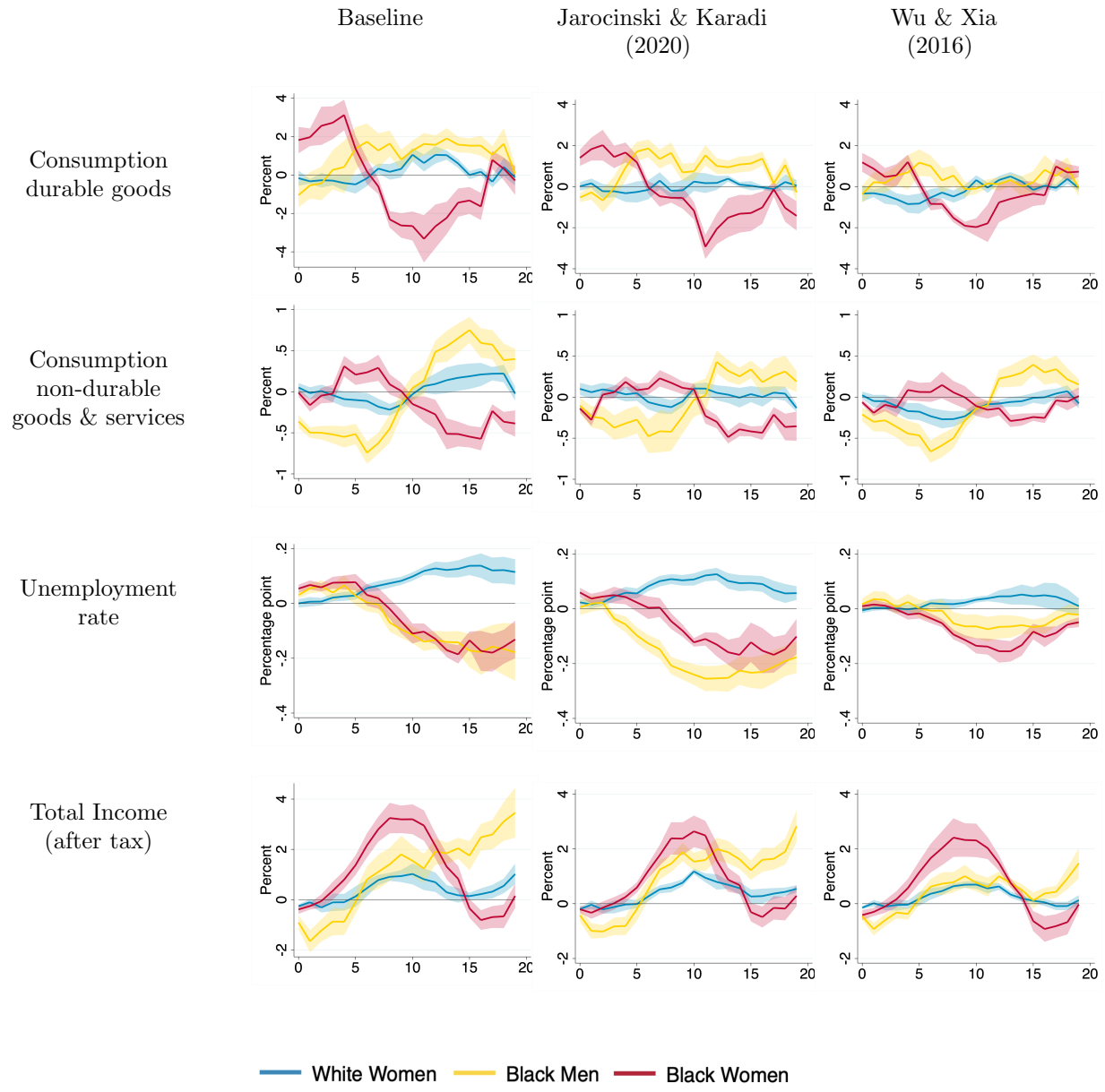
Note: The figure shows the effects of a 25bp contractionary monetary policy shock on log employment by sector. Data in figures a-c is from the ILO and d-j from the BLS 2000-2019. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.

Table F.1: Effects of monetary policy shocks on gaps in employment by sector

Sector	Gap	
	White - Black	Men - Women
Construction	8.218*	-0.099
	(5.402)	(1.969)
Education & Health services	0.355	0.802*
	(1.276)	(0.782)
Entertainment	-2.764	-0.186
	(6.21)	(0.769)
Finance & Insurance	0.536	-0.558*
	(1.41)	(0.528)
Hospitality	3.793*	-1.172*
	(1.377)	(0.436)
Information	-3.708*	0.699
	(1.792)	(0.796)
Management	3.76	1.062*
	(3.909)	(0.817)
Manufacturing	2.661*	-0.24
	(0.991)	(0.512)
Mining	18.022*	-0.542
	(5.654)	(4.706)
Other services	-0.498	-1.091
	(1.122)	(1.339)
Professional & Business services	1.694*	-1.365*
	(1.292)	(0.889)
Public Administration	-0.567	1.31*
	(0.955)	(0.856)
Real estate	8.037*	0.237
	(1.767)	(1.247)
Transport & Utilities	-1.689*	0.35
	(0.932)	(2.026)
Wholesale Retail Trade	-0.501	-1.2*
	(0.901)	(1.089)

Note: The table shows the effects of a 25bp contractionary monetary policy shock on race and gender gaps in log employment by sector at quarter 4. Data is from the BLS 2000-2019. * Significant at one standard deviation. Standard deviation in parentheses.

G Appendix: Effects of alternative monetary policy shocks on gender and racial gaps in main outcomes



Note: The figure shows the effects of a 25bp contractionary monetary policy shock on gaps in outcomes between households headed by white men and white women (blue), black men (yellow), and black women (red). The first column has estimates from equation 1. The second and third columns use the Jarocinski and Karadi (2020) monetary policy shock series and the Wu and Xia (2016) shadow rates in place of the instrument and 2-year Treasury yield. Time (horizontal axis) is in quarters. Shaded areas denote one standard deviation confidence intervals.