Monetary Policy and Racial Inequality

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Motivation

- New frontiers in thinking about monetary policy that were traditionally outside purview: inequality, climate, etc.

- Recent research has pointed to distributional effects of monetary policy over the business cycle (and potentially beyond).

- This paper studies the distributional impact of monetary policy along a specific social divide: race.

- 150 years after the end of slavery, racial gaps in income and wealth remain enormous in the U.S.

- In 2019, median black household wealth stands at 11%, median income 58% of white households.

What we do

- Our paper aims at a better understanding of how monetary policy impacts racial inequities in wealth and income.

- Specifically, we examine the effects of monetary policy shocks on black/white employment and black/white asset portfolios.

- We estimate employment and asset price effects of identified MP shocks in a unified LP-IV setting.

- We then link asset price changes to portfolio gains of black and white households using granular data from the SCF.

What we find

- We show that an accommodative MP increases employment and labor income more for black households.

- At the same time, asset price effects of MP shocks revalue heterogeneous household portfolios.

- Such asset-price-induced wealth gains from an accommodative shock overwhelmingly benefits white households.

- At the business cycle frequency, monetary accommodation widens racial wealth inequality but reduces racial income inequality.

Literature

Macro policies and racial inequalities

- Abell (1991), Carpenter and Rodgers (2004), Rodgers (2008), Bayer and Charles (2018), Derenoncourt and Montialoux (2020)

Monetary policy and heterogeneous portfolios

- Gornemann et al. (2016), Luetticke (2018), Kaplan et al. (2018), Auclert (2019), Auclert et al. (2020), Kekre and Lenel (2020), Caramp and Silva (2020)

Distributional effects of monetary policy

- Coibion et al. (2017), Andersen et al. (2021), Amberg et al. (2021), Holm et al. (2020), Adam and Tzamourani (2016)

Empirical evidence on distributional effects of MP

| Paper	Country	Data	Shocks	Distributions	Effect of expansionary MP shock
Coibion et al. (2017)	USA	CEX	Romer-Romer	Total income, earnings, expenditure, consumption	Decrease in Gini, P90-P10
Andersen et al. (2021)	Denmark	Admin	German/ Euro Area	Within-age disposable income	Increase in inequality along the distribution
Amberg et al. (2021)	Sweden	Admin	Romer-Romer	Total income	Increase in inequality: Gini, top income shares, P90/P50; decrease for P90/P10 P50/P10
Holm et al. (2020)	Norway	Admin	Romer-Romer	Disposable income, consumption, wealth	Decrease in P90-P10 for income and consumption; increase for wealth

Racial inequalities in income and wealth

Black and white HH wealth and income in the 2019 SCF

	Means		Medians		Share with holdings (%)	
	White	Black	White	Black	White	Black
Bonds	122,700	19,600	0	**0**	47	27
Housing	353,500	104,700	170,000	**0**	75	46
Equity	474,000	40,900	9,000	**0**	64	35
Other non-financial assets	33,400	13,500	17,000	8,000	90	72
Liquid assets	57,000	13,900	8,000	1,400	99	95
Other financial assets	28,400	7,600	0	0	37	30
Net wealth	951,300	139,800	**181,400**	**20,700**		
Debt	117,300	60,400	35,000	10,100		
Income	113,300	58,100	67,200	38,700		

- Black household median holding of equities, bonds, houses are zero.
- Large mean differences, in particular for financial assets.
- Substantial gaps in participation rates (extensive margin).

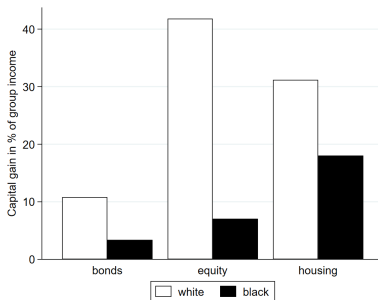# Average portfolio shares (percent of total assets)
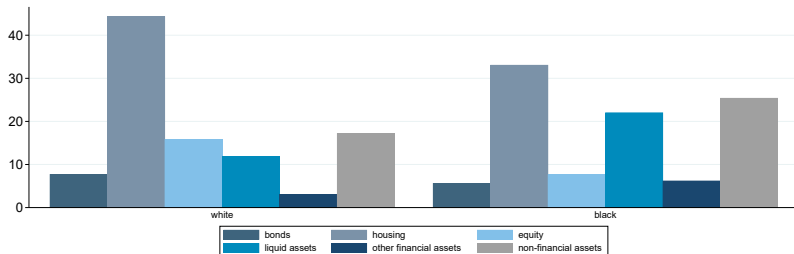
- Pronounced portfolio differences: equity share of white households twice as high, housing share about a third higher.
- Differences in portfolio composition give rise to different exposures to asset price changes.

Capital gains from 10-percent increase in asset prices
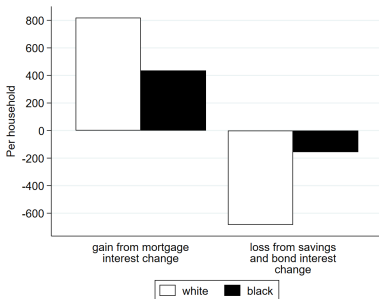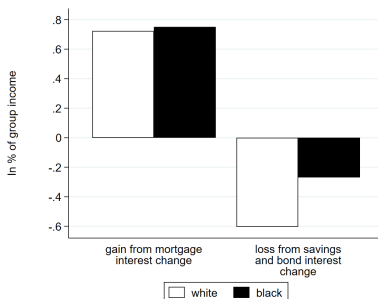

Per household
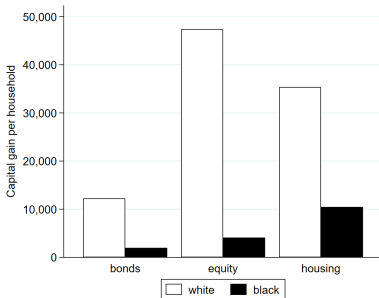
Relative to group income

- Larger gains for white than black households.
- Overall portfolio gains are sizeable relative to income.

Effects of a 100bp decline in interest rates

Per household

Relative to group income

- Assume all mortgage holders refinance debt and all creditors see interest income reduced by 100bp.
- Differential effects on black-white HH relatively small.
- Larger gap if fewer black HH refinance (Gerardi et al., 2021).

Monetary policy, asset prices and the unemployment gap

Effects of MP shocks

Step 1

- Estimate effects of identified MP shocks on the racial unemployment rate gap and on asset prices.
- LP-IV set-up following Stock and Watson (2018) and Jordà et al. (2020): shock measures as proxies for structural shocks.

Step 2

- Bring estimated asset price effects to the SCF household data for a first-order approximation of wealth changes.

Step 3

- Compare employment/earnings and portfolio effects over different time horizons.

Estimation strategy
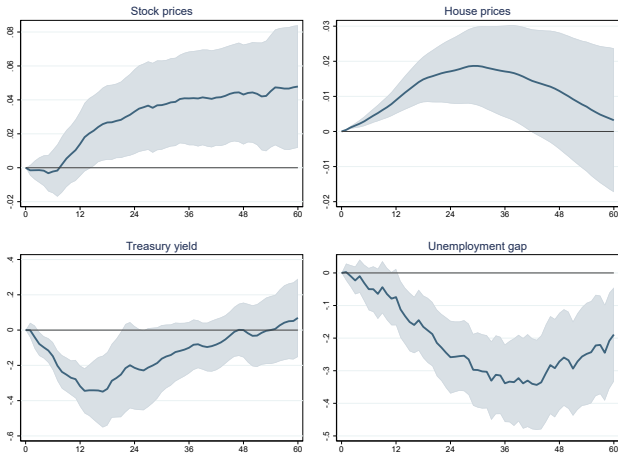
$$\Delta r_t = \Delta z_t \, b + x_t \, g + \epsilon_t$$

$$y_{t+h} = \alpha_h + \Delta \widehat{r}_t \, \beta_h + x_t \, \gamma_h + \nu_{t+h} \, ; \qquad \text{for } h = 0, \ldots, H-1$$

- y_{t+h}: change in unemployment gap and asset prices
- Δr_t: change in FFR at time t
- Δz_t: surprise component – Romer-Romer (RR), Bernanke-Kuttner (BK) or Gertler-Karadi (GK)
- x: controls (6 lags of outcome and shock variable)

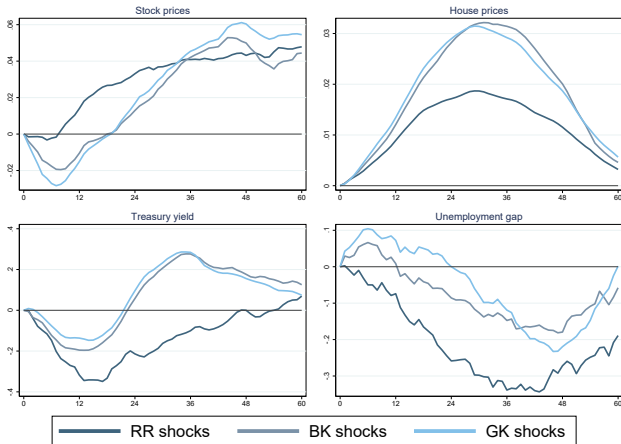▸ shock measures ▸ macro data

Effects with other shock series
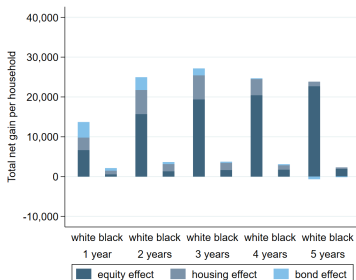
Portfolio effects

Portfolio effects

- We calculate the capital gains resulting from the asset price effects for black/white portfolios.
- Assumption: identical capital gains within each asset class recorded in the SCF (could be conservative: Xavier, 2020)
- Use duration data from Bloomberg to translate yield effects into price changes.
- Assume that the policy rate change passes through to deposit rates and the change in treasury yields to mortgage rates.
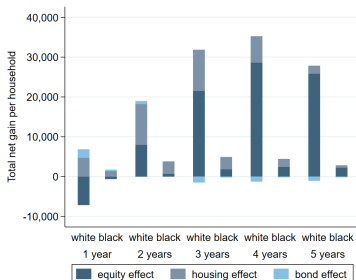
Capital gains for mean portfolios

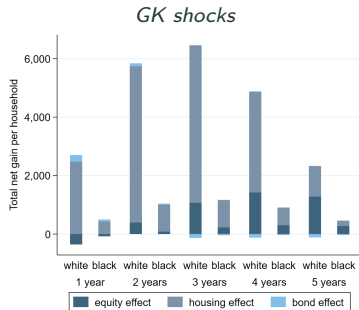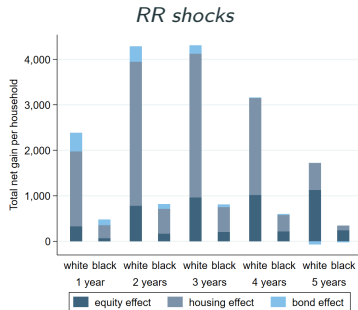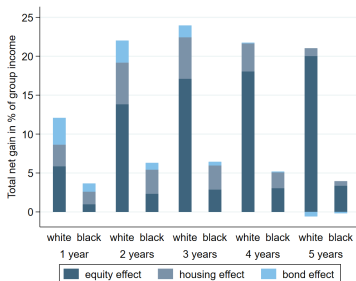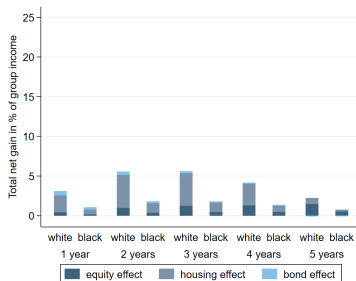# Effects around the median (40-60)

Capital gains after RR shock, relative to income

At the mean

Around the median

Effects on interest income and mortgage costs

At the mean

Around the median
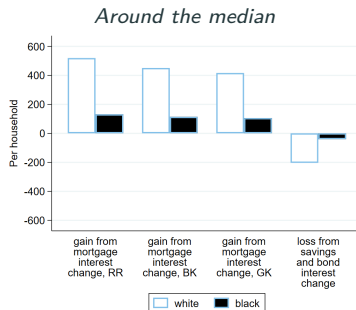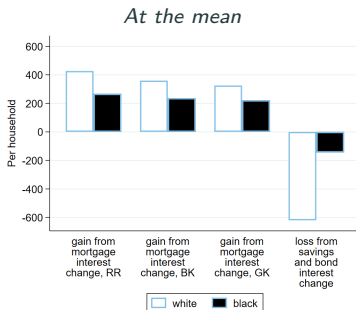
Comparing to employment effects

Quantifying the employment/earnings effect

- The earnings gain for black households relative to white households in period h after the monetary policy shock is:

$$\Delta_h Y = \Delta_h u(Y_E^B - Y_U^B)$$

- Y_E^B and Y_U^B denote average labor income of black households who have/have not been unemployed over the past 12 months and u the change in the unemployment gap.
- Earnings difference between black households w/ vs. w/o: unemployment experience $56,200 − $27,500 = $28,700.
- Peak employment effect at year 3 after MP shock: relative earnings gain per black household of $97 or 0.2% of black HH income.

Cumulative earnings and portfolio effects with RR shocks
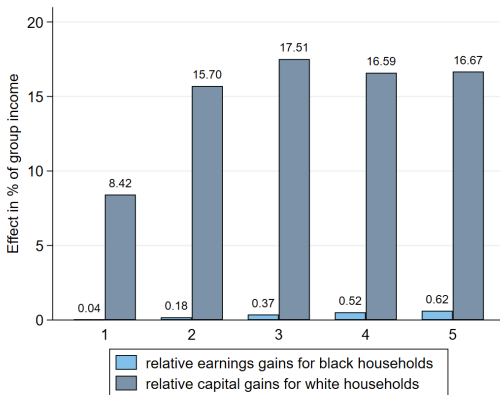
- Earnings gains are orders of magnitude smaller over 5 years.

Capital gains and consumption

- Chodorow-Reich et al. 2021; Di Maggio et al. 2020: MPC out of capital gains of 3 cents/dollar.

- For white HH, our mean estimate of capital gains translates into additional consumption of about \$600: consumption wealth effect on consumption alone six times higher than relative earnings gain for black households (\$97).

- Realization of capital gains through refinancing and mortgage equity extraction quantitatively important for consumption dynamics (Bartscher et al., 2021; Berger et al., 2018; Bhutta and Keys, 2016)

$\Rightarrow$ Expansionary MP improves labor market situation for black households, but effect on consumption inequality could conceivably go in opposite direction.

Beyond the cycle

- MP shocks typically seen to have short-run effects only, but many empirical studies find effects over multi-year horizons.
    - Bernanke 2020; Jordà et al. 2015; Paul 2020; Rigobon and Sack 2004.
- Short-run capital gains on assets can also have persistent effects:
    - Relaxation of collateral constraints eases access to credit for homeowners or business formation (Boerma and Karabarbounis (2021) and Iacoviello (2005)).
    - Life-cycle trading motives can make it impossible to wait for shock in opposite direction (Glover et al., 2020; Moll, 2020).
    - Inherited differences in asset ownership along racial lines can induce similar differences in propensity to buy assets.

Conclusion

Conclusion

- MP shocks differentially affect earnings and wealth of black and white households.

  - Black households reap larger benefits from accommodative policy in terms of employment and earnings.
  - White households have larger capital gains on assets.

- Effect on consumption inequality unclear, but conceivably increases with state-of-the-art MPC estimates.

- Trade-off for monetary policymakers: policies that reduce income differences exacerbate wealth inequality.

- Reduction of racial inequalities is a first-order objective for economic policy, but the tools of a central bank may not be the right ones to achieve this.

Monetary policy shock series

Name & Source	Method	Time Period
Coibion et al. (2017)	Extended Romer-Romer shocks identified as component of policy changes that is orthogonal to the Fed's information set, Federal Reserve Greenbook projections for GDP and inflation, and unemployment	3/1969 - 12/2014
Bernanke and Kuttner (2005)	Shocks identified through the difference between the target rate and the rate implied by front-month Fed Funds Futures contracts	11/1988 - 11/2020
Gertler and Karadi (2015)	Shocks identified through a combination of surprise changes to both front-month and 3-month-forward Fed Funds Futures contracts in a 30-minute window after FOMC meeting	11/1988 - 6/2012

Macroeconomic data

Variable	Description	Time Period	Source
Federal Funds Rate	Federal Funds Target	11/1988 - 11/2020	FRB
Industrial production	industrial production index	1/1960 - 9/2017	FRB
Stock price	S&P500 price	1/1960 - 9/2017	S&P
Inflation	CPI, all urban consumers	1/1960 - 9/2017	BLS
House price	Case-Shiller house price index	1/1975 - 9/2017	S&P Corelogic
Corporate debt yield	Moody's seasoned corporate BAA yield	1/1960 - 9/2017	FRB
Treasury yield	10-year constant maturity T-note yield	1/1960 - 9/2017	FRB
Unemployment rate	seasonally adjusted unemployment	1/1960 - 9/2017	BLS
Unemployment gap	difference in black and white unemployment rates	1/1972 - 9/2017	BLS

LP-IV estimates for response to 100bp expansionary MP shock

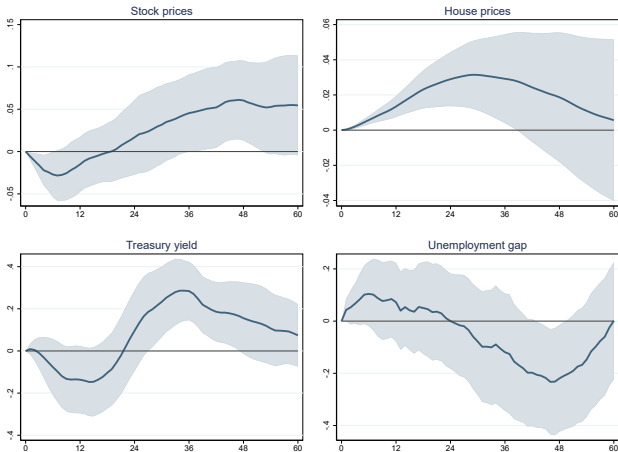| Shock	Horizon	Stock prices %	House prices %	Treasury yield pp	BAA yield pp	Unemployment gap pp	Inflation %
RR	1Y	1.40	0.89***	-0.32***	-0.37***	-0.07	-0.43***
		(3.30,-0.50)	(1.28,0.50)	(-0.20,-0.43)	(-0.28,-0.46)	(0.01,-0.16)	(-0.22,-0.64)
	2Y	3.31**	1.71***	-0.21	-0.36**	-0.26***	-0.43
		(5.81,0.81)	(2.63,0.80)	(0.02,-0.45)	(-0.13,-0.60)	(-0.15,-0.37)	(0.01,-0.88)
	3Y	4.09**	1.71**	-0.10	-0.23**	-0.34***	-0.20
		(6.85,1.33)	(3.02,0.41)	(0.05,-0.25)	(-0.05,-0.42)	(-0.22,-0.46)	(0.33,-0.74)
	4Y	4.32**	1.15	0.00	-0.04	-0.27***	0.03
		(7.26,1.37)	(2.82,-0.51)	(0.16,-0.16)	(0.12,-0.21)	(-0.12,-0.42)	(0.65,-0.59)
	5Y	4.79**	0.32	0.07	0.08	-0.19**	-0.06
		(8.40,1.18)	(2.37,-1.73)	(0.29,-0.15)	(0.29,-0.13)	(-0.04,-0.33)	(0.68,-0.81)
BK	1Y	-1.05	1.20***	-0.20	-0.28	0.01	-0.36
		(8.93,-11.03)	(1.87,0.54)	(0.12,-0.51)	(0.21,-0.78)	(0.37,-0.35)	(0.04,-0.76)
	2Y	1.29	2.82	0.06	-0.25**	-0.09	-0.35*
		(5.89,-3.31)	(5.76,-0.12)	(0.29,-0.17)	(-0.09,-0.41)	(0.18,-0.35)	(-0.02,-0.67)
	3Y	4.21	3.14	0.28	-0.13	-0.15	0.08
		(9.66,-1.24)	(8.28,-2.00)	(0.58,-0.03)	(0.19,-0.45)	(0.10,-0.39)	(0.67,-0.51)
	4Y	5.00	2.01	0.18	0.00	-0.18	0.47
		(12.79,-2.80)	(7.73,-3.71)	(0.57,-0.22)	(0.21,-0.20)	(0.49,-0.85)	(1.59,-0.65)
	5Y	4.44	0.46	0.13	0.21	-0.06	0.31
		(10.94,-2.05)	(5.86,-4.94)	(0.63,-0.38)	(0.73,-0.31)	(0.68,-0.80)	(2.01,-1.39)

LP-IV estimates for response to 100bp expansionary MP shock (continued)

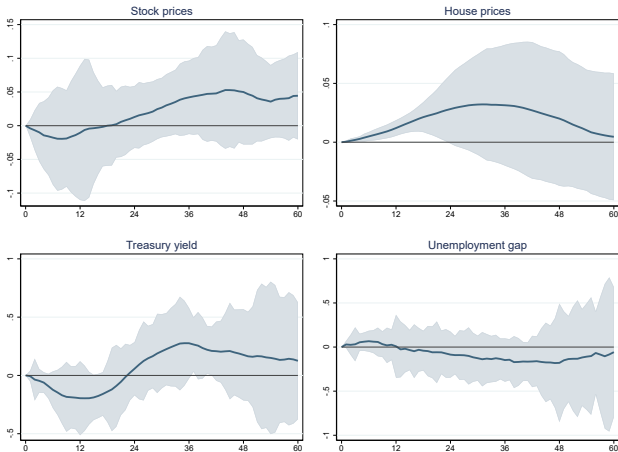| Shock	Horizon	Stock prices %	House prices %	Treasury yield pp	BAA yield pp	Unemployment gap pp	Inflation %
GK	1Y	-1.51	1.34***	-0.14	-0.22***	0.07	-0.37**
		(1.74,-4.76)	(1.94,0.74)	(0.02,-0.30)	(-0.09,-0.34)	(0.22,-0.08)	(-0.12,-0.61)
	2Y	1.68	2.90***	0.10	-0.24**	0.00	-0.43**
		(6.10,-2.74)	(4.43,1.36)	(0.29,-0.10)	(-0.08,-0.40)	(0.18,-0.18)	(-0.10,-0.75)
	3Y	4.54	2.92*	0.28***	-0.08	-0.12	-0.07
		(9.10,-0.02)	(5.45,0.39)	(0.42,0.15)	(0.10,-0.26)	(0.11,-0.34)	(0.35,-0.48)
	4Y	6.04**	1.87	0.16	-0.01	-0.22*	0.23
		(10.76,1.32)	(5.56,-1.82)	(0.32,-0.01)	(0.19,-0.20)	(-0.02,-0.42)	(0.74,-0.28)
	5Y	5.45	0.56	0.07	0.14	0.00	0.05
		(11.35,-0.45)	(5.16,-4.03)	(0.22,-0.07)	(0.35,-0.06)	(0.23,-0.22)	(0.49,-0.39)

▸ TV-VAR   ◂ back

Estimates using Gertler-Karadi shocks

# Estimates using Bernanke-Kuttner shocks

TV-VAR estimates for response to 100bp expansionary MP shock following Paul (2020)

Shock	Horizon	House prices %	Stock prices %	Treasury yield pp	BAA yield pp
Paul (2020)	1y	1.4	13.85	0.24	-0.11
		(-3.1, 5.82)	(-0.99, 29.48)	(-0.76, 1.29)	(-0.61, 0.34)
	2y	1.98	12.41	0.16	-0.1
		(-5.34, 9.54)	(-4.2, 30.69)	(-0.96, 1.36)	(-0.69, 0.47)
	3y	2.19	11.29	0.14	-0.09
		(-6.51, 12.1)	(-6.49, 30.95)	(-1.14, 1.39)	(-0.82, 0.54)
	4y	2.14	10.64	0.13	-0.06
		(-8.03, 14.24)	(-8.69, 31.45)	(-1.24, 1.5)	(-0.88, 0.62)
	5y	1.95	10.12	0.12	-0.04
		(-9.02, 16.24)	(-9.84, 32.93)	(-1.37, 1.67)	(-0.93, 0.73)

Summary statistics by marital status and sex

	Mean income	Mean wealth	Share of housing in total assets	Share of equity in total assets
White				
Single	57614	403456	0.36	0.38
Men	69194	469742	0.30	0.45
Women	49373	356279	0.41	0.31
Married	151141	1323076	0.32	0.46
Black				
Single	41466	82248	0.58	0.15
Men	51961	118201	0.54	0.20
Women	36146	64022	0.62	0.10
Married	90825	253066	0.49	0.24

Effects of MP shocks on mortgage refinancing and savings interest by marital status, per household
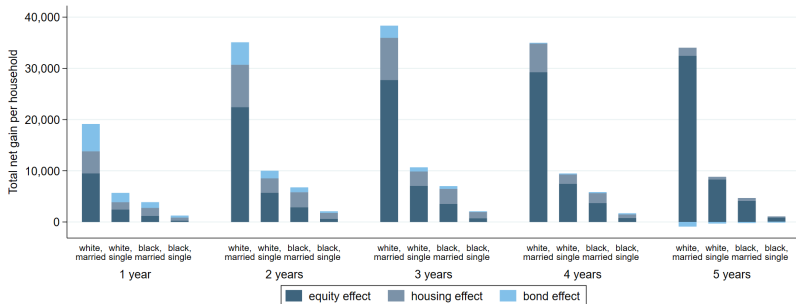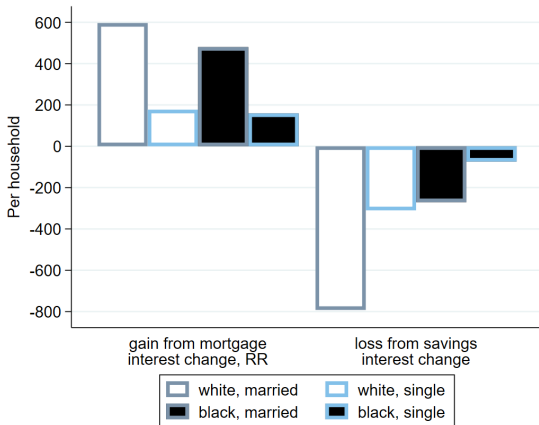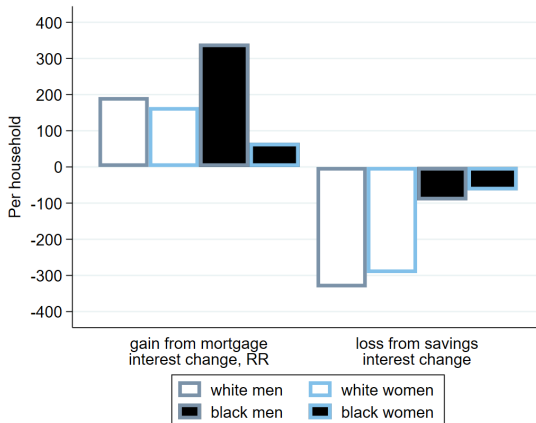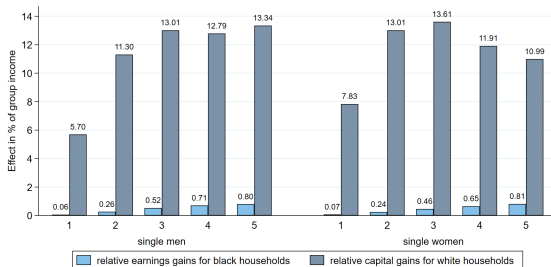
Effects of MP shocks on mortgage refinancing and savings interest by sex (singles), per household

Comparison of earnings and portfolio effects by sex (singles)