Minority Unemployment, Inflation, and Monetary Policy

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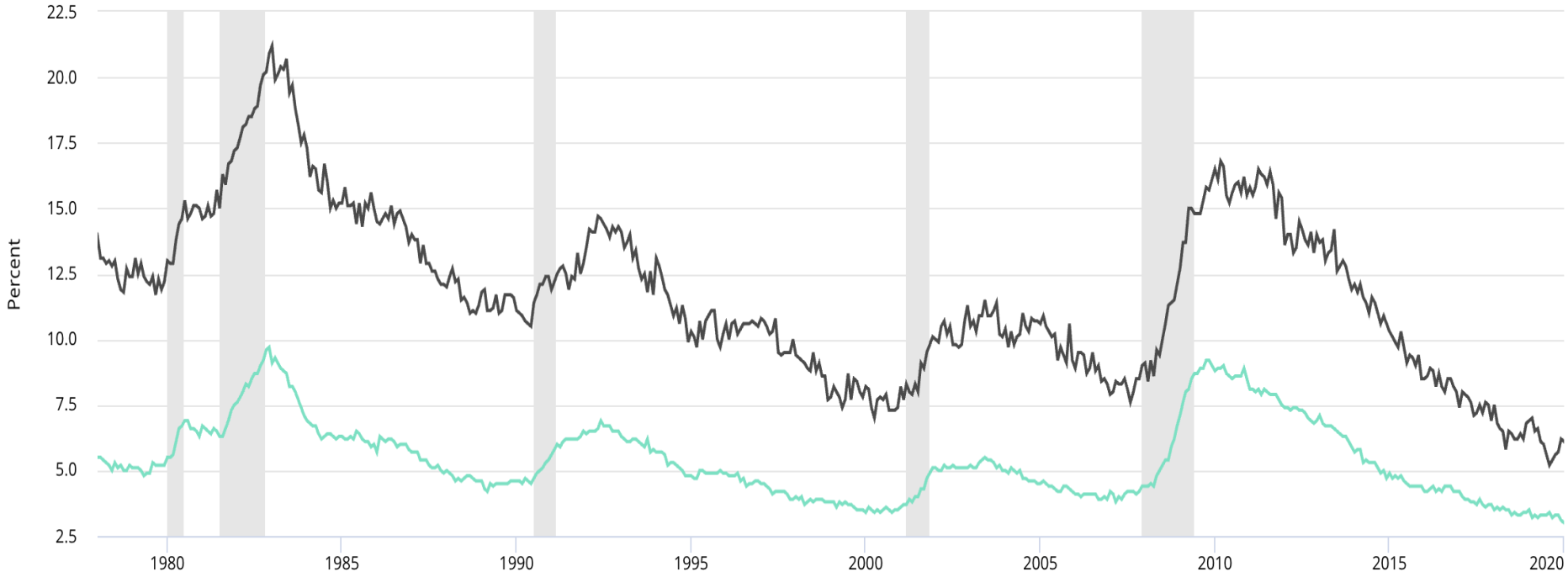
Note: the views expressed in this presentation are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Richmond nor the Federal Reserve System.

Throughout the presentation, we follow the AP, NYT, WaPo, and other major written outlets, and choose to capitalize "Black" and not capitalize "white". To this respect, we echo The New York Times' editorial board: "The Times looked at whether to capitalize white in reference to race, but it will remain lowercase. White does not represent a shared culture and history in the way Black does, and also has long been capitalized by hate groups."

Large employment gap between Black and white workers



"Observable characteristics can explain very little of the [unemployment] differential, [or] the remarkably low participation rate of Black men and the racial gaps in involuntary part-time employment" (Cajner et al. 2017)

A new mandate?

- "The Fed [should be] delivering more racial equity into the labor market and consider **targeting not the overall unemployment rate, but the Black rate**" Jared Bernstein, CEA (June 2020)
- FRREEA (June 2022): "The Board of Governors and the FOMC shall exercise all duties and functions in a manner that fosters **the elimination of disparities across racial and ethnic groups** with respect to employment, income, wealth, and access to affordable credit"

Research questions

If the Federal Reserve "targeted" minority unemployment...

- ⋆ ...how would heterogeneity between Black and white households affect the Fed's trade-off between unemployment and inflation fluctuations?

- ⋆ Would monetary policy under the "new mandate" successfully foster *the elimination of disparities across racial and ethnic groups in employment and income*?

This paper

- ⋆ How does heterogeneity between Black and white households affect the Fed's trade-off between unemployment and inflation fluctuations?

  → Inflation-unemployment trade-off is larger for Black HHs because price Phillips curve for them is steeper than for white HHs

  → "Targeting" Black unemployment is equivalent to overall more accommodative monetary policy

This paper (cont'd)

- ⋆ Would monetary policy successfully foster *the elimination of disparities across racial and ethnic groups in employment and income*?
  - → While accommodative policy cannot affect structural unemployment gap, it can mitigate real income volatility
  - → Accommodative policy *reduces* real income volatility for Black families more than for white ones — *unless* inflation expectations become unanchored

Unpacking our results: today's presentation

I. Microdata on employment and expenditures histories
   - Unemployment is about twice as high at all times
   - Volatility of prices for Black HHs is at 8-14% higher than for white HHs

II. "Targeting" the Black unemployment rate = overall more accommodative policy

III. Net policy effect = unemployment effect + prices effect. Black HHs are more exposed to *both*!

IV. Key parameter: how well-anchored inflation expectations are

Facts

u^B is about twice as large as u^w

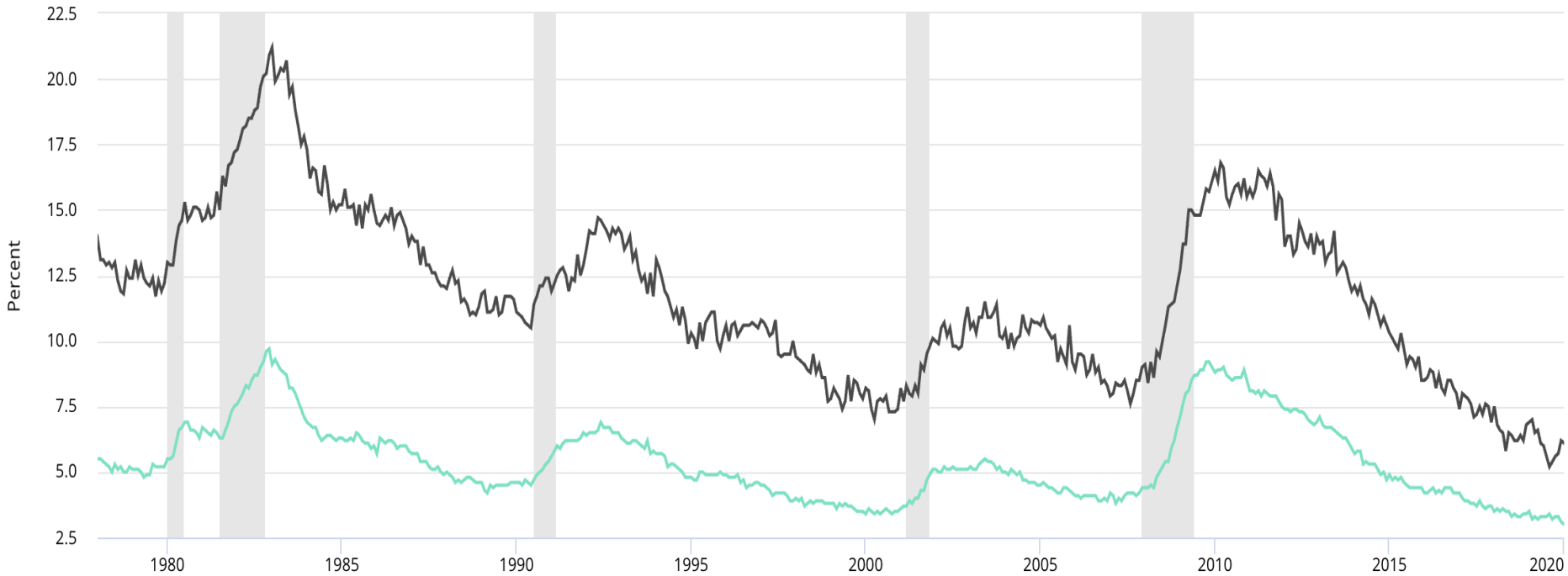


Figure: u^B in black, u^w in teal. Source: CPS.

u^B and u^w move closely over the business cycle

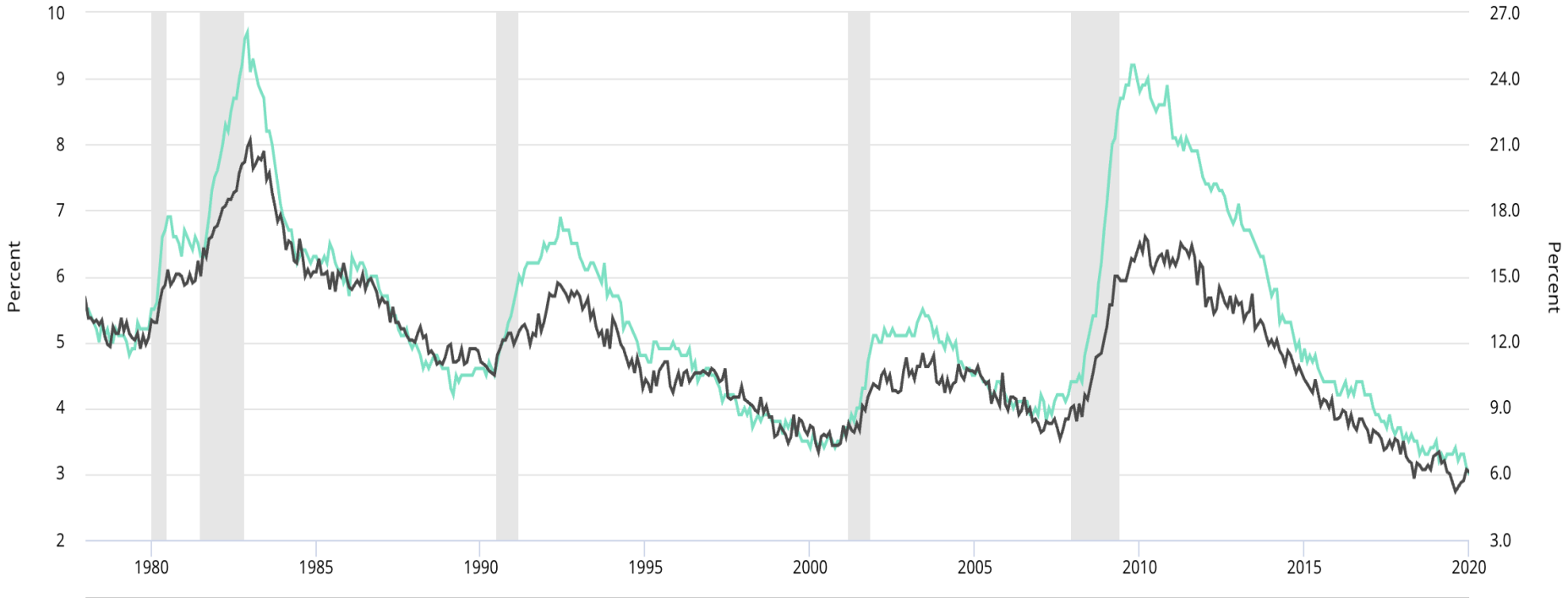


Figure: u^B in black (right), u^w in teal (left). Source: CPS.

Measuring inflation and price-stickiness by group

- Different households consume different consumer baskets, leading to differences in exposure to inflationary shocks (Moretti 2013; Diamond 2016; Handbury, 2019; Jaravel, 2019, 2021; Argente and Lee, 2020; Kaplan and Schulhofer-Wohl, 2017)
- We use CES data to back out typical consumption baskets for Black and white households (Cravino, Lan, and Levchenko 2020)
- Two ways to measure exposure to inflation:
  1. Construct group-specific price indexes using sectoral inflation data
  2. Construct group-specific average price duration (Nakamura and Steinsson, 2008)

Different baskets for different groups

Category	% of expenditure Black	white	Duration of all prices	Duration of regular prices
Electricity	3.4	2.4	**2.08**	2.08
Cable and Satellite Television Service	3.1	2.4	7.28	7.59
Wireless Phone Service	2.1	1.5	7.18	7.18
Intracity Mass Transit	0.8	0.2	42.66	42.66
Cigarettes	1.6	1.1	2.44	3.79
Full Service Meals and Snacks	2.1	3.3	**19.18**	19.53
New Car and Truck Purchase	0.5	1.1	0.00	0.00
Motors and Sports Vehicles	0.0	0.6	8.72	11.72
Club Dues/Sports/Group exercise fees	0.3	0.7	7.45	11.17
Physicians' Services	1.2	1.6	29.16	29.16
Median (top 10 Black)			**7.23**	7.38
Median (top 10 white)			**12.28**	14.83

The table reports the categories with the largest differences in expenditure shares between Black and white households, and the relative frequency of price changes.

Black HHs face higher overall price volatility

	Black	white	Δ (%)
Duration, all prices (months)	8.07	8.51	-5.2
Duration, regular prices (months)	12.12	12.59	-3.7
Std. dev. of CPI (whole basket, CES 1998-2020)	2.48	2.30	**7.8**
Std. dev. of CPI (retail goods, Nielsen 2004-2020)	0.84	0.74	**13.5**
— different consumption basket			9.3
— different price changes			4.2

The table reports weighted mean duration of prices and the standard deviation of the 12-month log change in CPI for Black and white households (CES data). Nielsen data results on a quarter-to-quarter basis from Lee (2022).

Taking stock

- Black unemployment $\approx 2 \times$ white unemployment
- Volatility of Black CPI $\approx$ 1.08-1.14 $\times$ volatility of white CPI

$\rightarrow$ meaningful trade-off: Black HHs have more to gain from $\sigma_u \downarrow$ but also more to lose from $\sigma_\pi \uparrow$

Framework

Real income

Two types of HHs: $k \in \{B, w\}$, consuming goods and services with price index P. Real income is:

$$Y_t^k \equiv \frac{\omega_t^k (1 - u_t^k)}{P_t^k}$$

with:

- $\omega_t^k (1 - u_t^k)$ labor income
- P_t^k k-specific price index

- σ_u unemployment effect
- $\sigma_{\omega/P}$ prices effect

The Phillips curves and monetary policy

Inflation-unemployment trade-offs (Hazell, Herreno, Nakamura, Steinsson, 2022)

$$\pi_t^{\omega,k} - \mathbb{E}_t[\pi_\infty^{\omega,k}] = -\psi^{\omega,k}\widehat{u}_t + \mu_t^{\omega,k}, \tag{1}$$

$$\pi_t^{p,k} - \mathbb{E}_t[\pi_\infty^{p,k}] = -\psi^{p,k}(\widehat{u}_t - \eta_t) + \mu_t^{p,k}, \tag{2}$$

with $\mathbb{E}_t[\pi_\infty^{i,k}] = b\pi_t^{i,k}$ and b the credibility parameter

Monetary policy rule:

$$\pi_t^p = \zeta(u_t - u) \tag{3}$$

where ζ is the accommodation parameter

Details

"Targeting" Black u

New mandate:

$$\pi_t^p \simeq \zeta u^B \widehat{u}_t$$
$$= 2\zeta u^W \widehat{u}_t$$

using that, empirically, $u_t \approx u_t^W$.

$\rightarrow$ **"targeting" $u^b \approx$ more accommodative monetary policy ($\zeta \uparrow$)**

Note: $\hat{u} = \log(u_t^k / u^k) \Rightarrow du_t^k = u^k \hat{u}$.

Effect of η on π and u is mediated by b, ψ^p, ψ^ω, and ζ

Define

$$\Phi \equiv 1 - \frac{\zeta u}{\zeta u + \psi^{p,W}/(1-b)}$$

the sensitivity of unemployment to the cost-push shock.

Then, combining the Phillips curves with the monetary policy rule, we have:

$$\pi_t^{p,k} = \frac{\psi^{p,k}}{1-b}(1-\Phi)\eta_t, \qquad \pi_t^{\omega,k} = -\frac{\psi^{\omega,k}}{1-b}\Phi\eta_t \qquad \text{and} \qquad \widehat{u}_t = \Phi\eta_t$$

How does accommodative monetary policy translate into real income volatility?

Let the economy be in steady state at t=0. Real income as a function of the shock η_1:

$$\widehat{Y}_1^k \simeq -\left(\frac{(1-\Phi)\psi^{p,k} + \Phi\psi^{\omega,k}}{1-b} + \frac{u^k}{1-u^k}\Phi\right)\eta_1$$

Object of interest:

$$\frac{d\sigma_Y^k}{d\sigma_u^k}$$

where σ_Y^k is the variance of income and σ_u^k of unemployment for group k.

$$\frac{d\sigma_Y^k}{d\sigma_u^k} = \underbrace{\frac{1}{1-u^k}\frac{u^k}{u}}_{\text{unemployment effect}} - \frac{1}{1-b}\underbrace{\left(\frac{\psi^{p,k}}{u} - \frac{\psi^{\omega,k}}{u}\right)}_{\text{prices effect}}$$

Estimation and calibration

Phillips curves

Goal: estimate ψ_p^k/u for $k = B, w$

Empirical strategy: long-difference IV-2SLS estimation

- Quarterly data from CES, BLS-CPI and CPS
- IV estimation uses dummy for 2008q4-2016q4 as instrument and seasonal controls
- Robust standard errors using Newey-West with 3 lags

Identifying Assumption: the unemployment gap is slow-moving and long-lived, while labor or goods market distortions and cost-push shocks are quickly-resolving and short-lived.

Details

Calibration

	ADP, base pay†	ADP, full pay††	OES, wages
ψ_p^B/u	**0.85**	0.85	0.85
ψ_p^W/u	**0.78**	0.78	0.78
ψ_ω^B/u	0.34	*0.34*	*0.44*
ψ_ω^W/u	0.34	*0.41*	*0.45*
u^B	0.10	0.10	0.10
u^W	0.05	0.05	0.05
u	0.05	0.05	0.05

† coefficients from Grigsby, Hurst, and Yildirmaz (2021) to calibrate ψ_ω^B, ψ_ω^W

†† Anderson and Shapiro 1996; Hirsch and Macpherson 2004; Johnson and Neal 1996; Bayer, Ross, and Topa 2008; Heywood and Parent, 2012 document that Black workers' total pay is substantially less likely to differ from their base pay than white workers'

GHY 2021 Context

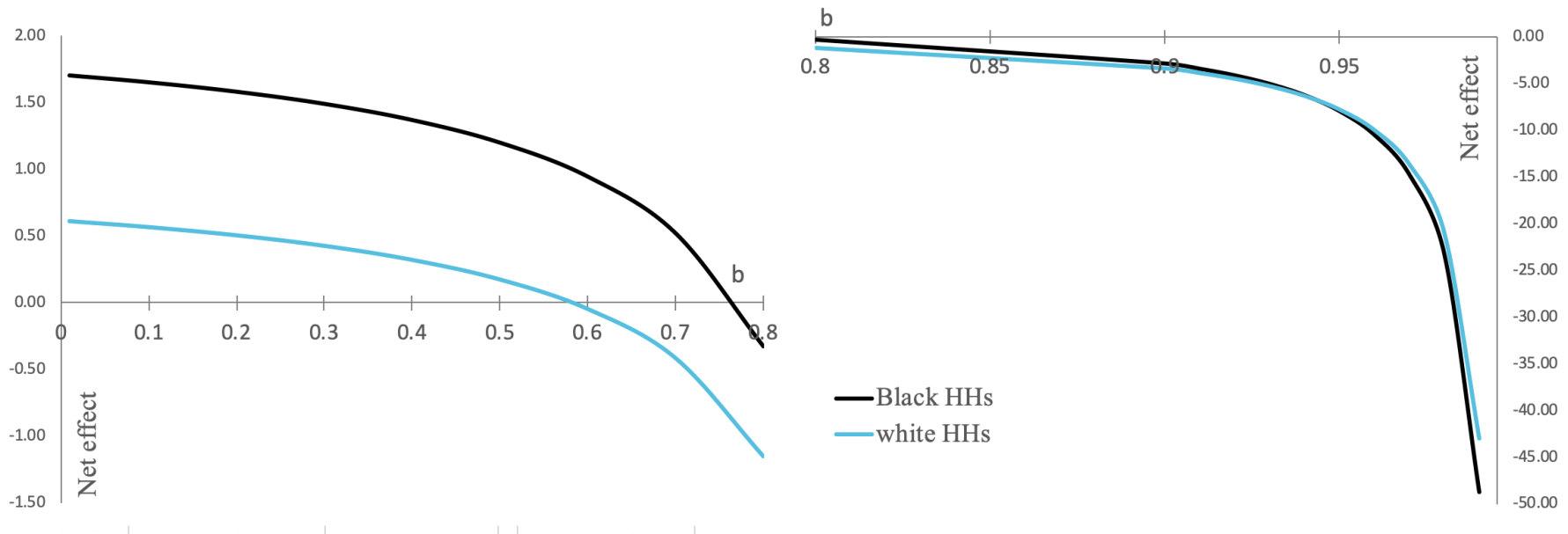
Results

How does accommodative monetary policy translate into real income volatility for HH k?

$$\frac{d\sigma_Y^k}{d\sigma_u^k} = \underbrace{\frac{1}{1-u^k}\frac{u^k}{u}}_{\text{unemployment effect}} - \frac{1}{1-b}\underbrace{\left(\frac{\psi^{p,k}}{u} - \frac{\psi^{\omega,k}}{u}\right)}_{\text{prices effect}}$$

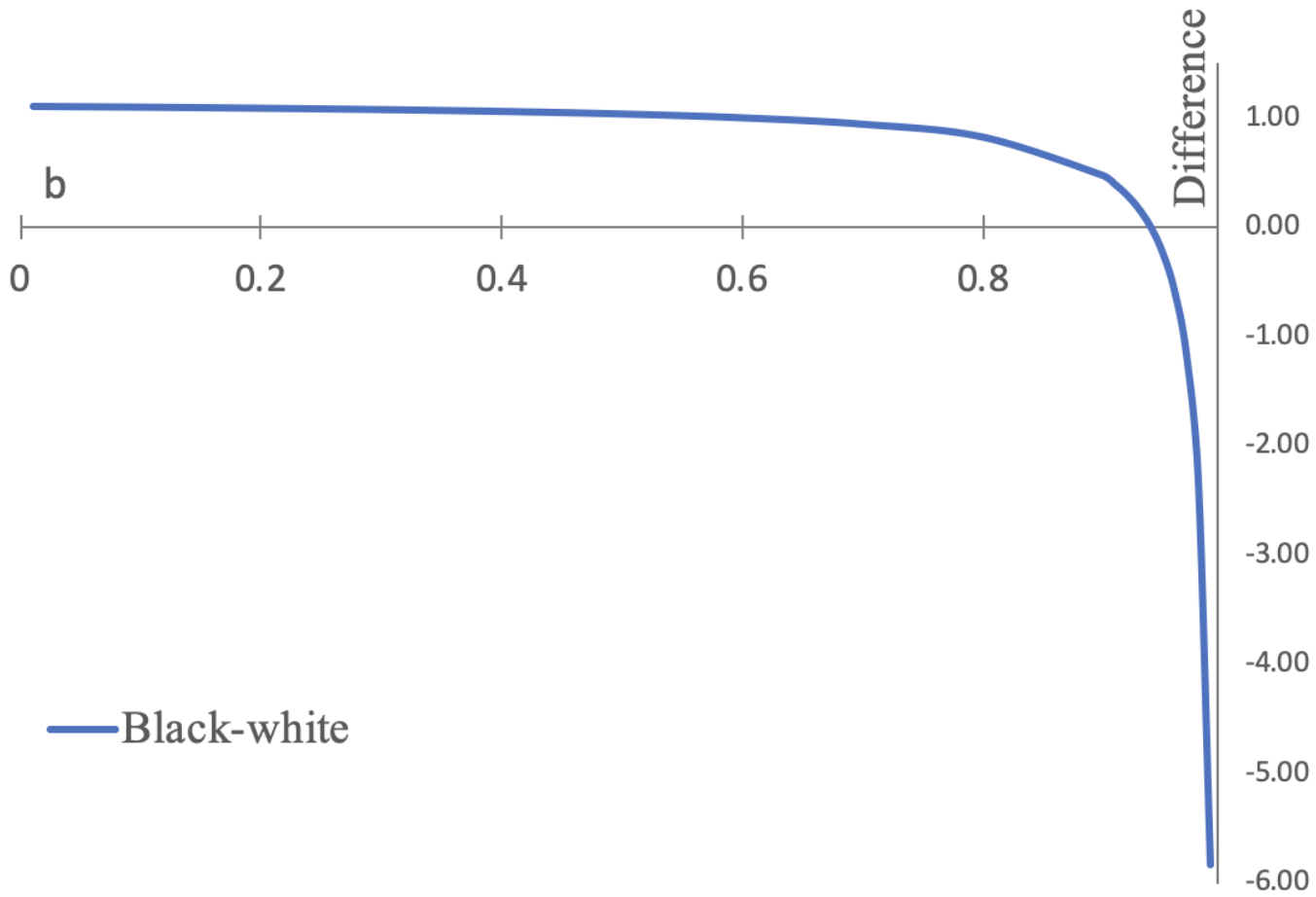
	ADP, base pay	ADP, full pay	OES, wages
unempl. effect B	2.22	2.22	2.22
unempl. effect W	1.05	1.05	1.05
prices effect B	0.51	0.51	*0.41*
prices effect W	0.44	*0.37*	*0.33*

Net effect of accommodative monetary policy as a function of b



Full graph

Difference in net effect as a function of b



Conclusions

If the Federal Reserve "targeted" Black unemployment...

- ⋆ ...the policy would be equivalent to more accommodative monetary policy
  - unemployment effect + prices effect → Black HHs are more exposed to *both*!
- ⋆ The policy would reduce disparities in real income *volatility* between Black and white families
  - unless inflation expectations become unanchored!

Thank you!

Comments welcome at claudia.macaluso@rich.frb.org

Appendix

Microfundations

- Galì, Smetz and Wouters (2012) provide microfoundations for a New Keynesian wage Phillips Curve
- key assumption: monetary policy does not affect the short-run dynamics of unemployment

$$\widehat{u}_t = (1-\rho)\bar{u}_t + \rho\widehat{u}_{t-1} + \varepsilon_t$$

where $\bar{u}_t$ is the long-run component of unemployment, which follows a random-walk, ε_t is a serially uncorrelated policy shock, and the wage Phillips Curve is given by

$$\pi_t^{\omega,k} = -\tilde{\psi}^{\omega,k}\widehat{u}_t + \beta E_t \pi_{t+1}^{\omega,k}$$

- by iterating forward one gets

$$\pi_t^{\omega,k} - \mathbb{E}_t[\pi_\infty^{\omega,k}] = -\psi^{\omega,k}\widehat{u}_t + \mu_t^{\omega,k},$$

- price Phillips curve from Hazell, Herren, Nakamura, and Steinsson (2022) (eqn. 3)

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Regressions (PC estimation)

$\text{Lehman}_t = \mathbb{I}\{t \in (2008q4, 2016q1)\}$

2SLS:

$$\pi_t^{p,k} - \mathbb{E}_t[\pi_\infty^{p,k}] = -\psi^{p,k}(\widehat{u}_t - \eta_t) + \mu_t^{p,k}$$

$$\widehat{u}_t - \eta_t = \alpha + \beta \text{Lehman}_t + \nu_t$$

$$\rightarrow \psi^{p,w}/u = 0.78(0.36) \text{ and } \psi^{p,B}/u = 0.85(0.39)$$

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PC slope estimates

- literature: effect of unemployment on inflation *within a given quarter*, for given inflation expectations *in the subsequent quarter*
- this paper: ψ includes the effect of persistent unemployment over the transition (i.e., it is the time-aggregated medium term effect of unemployment fluctuations).
- Hazell et al. (2022) estimate that, then, one should multiply the Phillips curve coefficient by 6.16 in order to account for the slow transition of unemployment back to its natural level.
- Hazell et al. 2022 (including non-tradables) has $\psi/u = 0.0552$ per quarter for annualized inflation (which implies $0.0552 \times 6.16 = 0.34$).
- Coibion, Gorodnichenko, Kamdar 2018 find $\psi/u = 0.23$ ($\times 6.16 = 1.42$).
- $0.34 < 0.78 < 0.85 < 1.42$

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Grigsby, Hurst, Yildirmaz (2022)

For ψ_ω^k we use the coefficients estimated from GHY's equation 1 (and reported in their Table 2):

$$\Delta w_{ijst} = \alpha + \beta \Delta u_{ijst} + \gamma_i + \gamma_s + \gamma_j + \Gamma X_{it} + \epsilon_{ijts}$$

GHY's dependent variable is the change in base wage pay for incumbent workers and the independent variable is the change in the state unemployment rate.

- strong evidence of nominal base wage rigidity for job stayers $\rightarrow$ duration of nominal base wages $\approx$ 6 quarters
- patterns are similar for both salaried or hourly workers, or high and low wage workers, or workers who receive (or not) yearly bonuses
- no excess cyclicality for job-changers and new hires
- shown via a matching estimator controlling for age, sex, industry, and skill (= lagged wages conditional on tenure)

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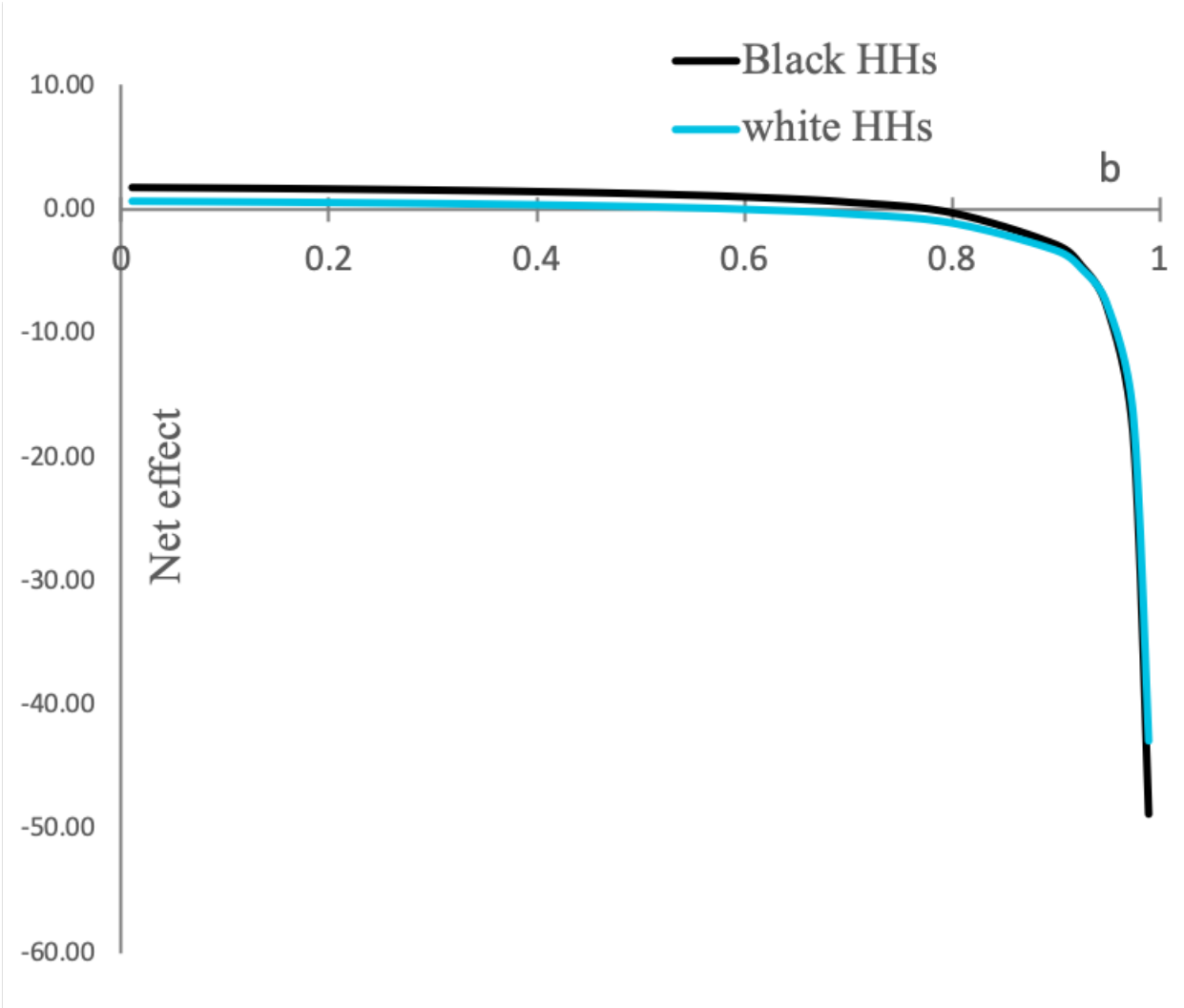
Net effect of accommodative monetary policy as a function of b



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