



Contractionary Monetary Policy
and the Dynamics of U.S. Race and
Gender Stratification

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Abstract

This paper explores the distributional effects of contractionary monetary policy by race and gender in the US from 1979-2008 using state-level panel data. We hypothesize that women and Blacks, as groups with less power and lower status in the social hierarchy, fare worse in the competition over jobs, resulting in a disproportionate rise in female and Black unemployment rates relative to White males. We also investigate the possibility that Blacks bear a greater burden of joblessness than females as Black population density rises. Results indicate the costs of fighting inflation are unevenly distributed amongst workers, weighing more heavily on Black females and Black males, followed by White females, and lastly, White males.

JEL codes: E24, E52, J7

Key words: Monetary policy, stratification, race, gender, unemployment.

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I. Introduction

Central banks across the globe have shifted the emphasis of monetary policy to an almost singular concern with controlling inflation over the goal of employment generation.¹ The primary instrument in the central banker's toolkit is nominal interest rates, designed to act on the demand-side of the economy by slowing consumption and investment. The cost of controlling inflation via this method is an increase in unemployment.

Inflation targeting as a policy stance has been criticized on several grounds. In developing countries especially, inflation tends to be the result of supply-side bottlenecks rather than excess aggregate demand. That structural feature of developing countries inhibits the effectiveness of inflation targeting and raises the social costs of reducing inflation rates. Further, even when inflation is a demand-induced phenomenon, a body of evidence suggests that inflation rates below 15-20 percent are not harmful to growth, particularly in developing countries, suggesting central banks could do much more to reduce unemployment than they currently are doing (Pollin and Zhu, 2006).

A third concern, one we explore here, is that the costs of inflation are unevenly distributed. Contractionary monetary policy can exacerbate gender and racial inequalities if subordinate groups experience a disproportionate share of the resulting job losses. Weaker power and status in the social hierarchy may result in women and ethnic subordinate groups (acknowledging the overlap of these two groups) faring worse in the competition over jobs relative to White men during economic downturns.² Unequal effects may be transmitted indirectly in ways that reflect structural features of gender and racial hierarchies. Women and people of color tend to be concentrated in more precarious forms of employment with temporary, part-time, or contingent jobs more likely to be eliminated when demand falls. Racial and gender effects of disinflationary policy also result from social stratification, whereby norms and stereotypes identify men, and in particular, White men as more deserving of jobs when jobs are scarce, ratifying both gender and racial hierarchies.

Empirical investigations of the gender and racial (African Americans and Whites in the US) effects of contractionary monetary policy have employed a variety of methodologies, most frequently Vector Autoregression (VAR) techniques. Most studies investigate effects either by gender or by race but not both. A consistent finding in that research is that African Americans bear a heavier burden of joblessness relative to Whites in response to interest rate hikes. In contrast, the gender-focused research has yielded contradictory results. One study, using a developing country sample, finds evidence that women's relative disadvantage in job access in response to contractionary monetary policy episodes (Braunstein and Heintz 2008). Results from empirical analyses of developed countries are contradictory. While Tachtamanova and Sierminska (2009) found no such effects for OECD countries, Heintz and Seguino (2009) found evidence that women in the US face more job losses than men in response to contractionary monetary policy.

Previous research has not considered the interaction of race and gender hierarchies in job rationing in response to contractionary monetary policy.³ As a result, we know little about job competition between these two subordinate groups in response to contractionary monetary policy. It is possible that the intensity of the gender effect depends on the share of the ethnic subordinate group in the population in any given geographic region, with women's job losses attenuated as Black population density rises. If such evidence does exist, it would imply the existence of a "nested" hierarchy whereby race trumps gender as a social marker during hard economic times. Further, if the ethnic share of the population does influence women's job losses relative to White men's, failure to identify consistent gender effects in some previous research may be an artifact of the aggregate level of analysis.

To investigate how these social dynamics play out in the context of race and gender competition over jobs, we employ a state-level panel data set to empirically estimate the determinants of Black/White male and female/White male unemployment rate ratios. We disaggregate further to also consider the determinants unemployment of subgroups relative to White men, specifically Black women, Black men, and White women. Although it would be desirable to expand the analysis to include Hispanics and

Asians, data limitations would have resulted in an unacceptably small number of observations.

The goals of the empirical analysis are three-fold. First, we seek to determine whether the methodological approach we utilize yields results consistent with previous research indicating that the costs of contractionary monetary policy are unevenly distributed between ethnic groups. Our approach differs in that White males represent the dominant group, while previous studies include White women and men. Second, we capitalize on the variation of the share of African Americans in the population at the state level to explore the possibility that race is a more salient factor in allocating scarce jobs than gender. We do this by evaluating the effect of Black population density on the female/White male unemployment ratio, hypothesizing that the size of the effect is inversely related to Black population share.

Third, we explore the data to determine whether, at critical levels, Black population density triggers a shift in White attitudes consistent with either threat or contact theory, and examine the consequences of these dynamics with regard to the response of women's relative unemployment to monetary policy. Threat theory postulates that increases in Black population density can intensify racist group identity in response to Whites' perceived threat to their group position. This could generate intensification of racial norms and stereotypes, resulting in Blacks bearing a greater burden of the increase in unemployment than Whites in response to contractionary monetary policy. Conversely, contact theory suggests that greater contact, measured as Black population density, weakens the propensity for discrimination on the part of Whites, resulting in a lower unemployment rate gap between Blacks and Whites.

Anticipating the results of this analysis, we find that women and Blacks are more likely to experience increases in unemployment than White men in response to contractionary monetary policy. Those effects are more negative for Blacks than women, and for Black women than White women. We also find evidence that the relationships between relative unemployment rates and our key monetary policy variable vary with the Black share of the population. These findings are important for macroeconomic policymaking and, more specifically, monetary policy. The evidence underscores that macroeconomic policy is neither race- nor gender-neutral. Apart from the inherent

problem of socially distortionary policies, recent scholarship shows that lack of attention to distributional effects of macroeconomic policies can produce negative long-run consequences for the economy in terms of lost productivity.

II. The distributional effects of contractionary monetary policy

Recent decades have witnessed a shift in central bank policy from a dual concern with both employment and inflation to an almost exclusive focus on keeping inflation low and close to zero (Epstein and Yeldan 2008). The change in policy emphasis has occurred in both developed and developing economies. The distributional effects of inflation targeting are of great interest in the context of widening income and wealth gaps within and between countries over the last three decades (ILO 2008). Here we focus on employment outcomes as one of the central ways in which monetary policy impacts inequalities in income and economic opportunity.

The primary tool used in inflation targeting is the manipulation of short-term interest rates (in the US, the federal funds rate) charged to banks. Interest rate changes are intended to work on the demand side of the economy. In the US, an increase in the federal funds rate raises the cost of lending to banks, thereby reducing borrowing for investment and consumption and thus aggregate spending. The effects of contractionary policy on employment are summarized in the concept of the sacrifice ratio, measured as the percentage decline in employment (alternatively, output) in response to a one percent decline in the rate of inflation.

A critical question is whether the impacts of interest rate-induced economic contractions vary systematically by gender and race. William Greider (1987), in a series of interviews with former Federal Reserve Bank members of the Board of Governors found they believed their policies to be distributionally neutral and their decisions, rather than rewarding one group or another, simply pursued their vision of sound macroeconomic management. Abell (1991) argues that although Federal Reserve reaction functions appear to only emphasize aggregate concerns – price stability, unemployment rates, and interest rates – the sociological makeup of the Fed (White male elites) can lead them to privilege the interests of the wealth holding class and ignore negative

distributional effects on men and women of color. Of course, the Fed's actions do not produce direct distributional effects; those are transmitted via the impact of interest rate changes on business and consumer borrowing, and as a result, on employers' decisions on whom to hire or fire in response to changes in demand.

In racially- and gender-equitable societies, race and gender differences in the probability of unemployment across business cycles would not exist, although individual probabilities of being unemployed might vary, stemming from differences in human capital and the elasticity of product demand that would result in differential effects across industries and occupations. For example, employers may find it profitable to retain more skilled workers when shedding labor. And, interest rate hikes and subsequent declines in aggregate demand may differentially affect occupations and industries. Systematic intergroup differences in human capital and job concentration do exist, however, indicative of processes of group stratification that can explain at least a portion of race and gender differences in layoffs during downturns. Racial job competition models and evidence as well as a large body of gender research find people of color and women from dominant ethnic groups tend to be crowded into jobs and industries with low wages and benefits, characterized by employment volatility and absence of opportunities to move up the job ladder (Bonacich 1972; Hartmann 1976; Mason 1995, 1999; Standing 1989; Williams 1987, 1993; Williams and Kenison 1996). Job competition that slots subordinate groups for less stable jobs in lower-wage industries may indirectly contribute to differential gender and racial unemployment effects in response to interest rate hikes.

Several studies further suggest that overt discrimination is a cause of unequal unemployment rates by race and gender. For example, research on the cyclical patterns of employment has found that less than half of the Black-White male unemployment gap in the US can be attributed to observable factors other than race (Holcombe 1988; Stratton 1993; Sundstrom 1997). Similarly, Azmat, Guell, and Manning's (2004) investigation of female-male unemployment gaps in OECD countries fails to find support for human capital-related explanations. The authors did find, however, a correlation between gender gaps in unemployment and attitudes on men's deservingness of work when jobs are scarce, suggesting that hierarchical gender norms and stereotypes contribute to women's greater likelihood of experiencing unemployment during recessions. In a study of three

large Caribbean economies (Barbados, Jamaica, and Trinidad and Tobago), Seguino (2003) provides evidence that women are the last to be hired during economic upturns, controlling for female and male labor supply and industry. The tendency to hire men first in upturns is evident even in female-dominated industries. Rives and Sosin (2002) find that US women's unemployment rates are consistently higher than men's within occupations, but the gender distribution across occupations results in lower economy-wide unemployment rates for women during downturns.

Another body of research explicitly considers the impact of contractionary monetary policy by race and gender. Several studies, using VAR techniques, find that contractionary monetary policy has unequal impacts on unemployment or employment by race (Abell 1991; Thorbecke 2001; Carpenter and Rodgers 2004; Rodgers 2007), Thorbecke (2001) speculates that differentially negative effects on Blacks may be due to "ladder effects," wherein less skilled workers are laid off first due to firm investment in training of higher skilled workers, or a ratcheting upward of employers' selectivity, a less costly choice during recessions.⁴ Further, lower wage workers may also have less bargaining power in contrast to higher wage workers who are better able to protect their jobs during economic hard times. Another factor is discrimination in job access, likely to intensify in a labor market with job shortages as racial norms and stereotypes come into play in the job rationing process.

Evidence on the gendered impact of disinflationary policy is less consistent. Braunstein and Heintz (2008) find a negative impact on women's employment relative to men's in developing countries, using a method that examines outcomes following inflationary episodes. In contrast, Tachtamanova and Sierminska's (2009) recent study of OECD countries finds no evidence of systematic gender differences in unemployment rates. Heintz and Seguino (2009), however, obtained evidence that Blacks and women differentially suffer unemployment relative to Whites and males, respectively, in response to increases in the US federal funds rate. Their approach, novel in this literature, is to estimate a four-equation system that includes a Philips curve, a central bank reaction function, the aggregate unemployment rate, and unemployment Black/White (female/male) unemployment rate ratio equations.

Absent in the existing body of research is a consideration of how job competition between women and people of color plays out during periods of job scarcity due to contractionary monetary policy.⁵ Is there evidence of “nested” hierarchies with either women or Blacks at the back of the job queue? That is, do structures of gender or of racial stratification dominate in situations of job scarcity?

III. Stratification by Race and Gender: Complements, Substitutes, or Unrelated?

Racial stratification: The reproduction of race identity, norms and stereotypes

To understand the interaction of racial and gender hierarchies in labor markets, we consider here the emerging literatures on the economics of identity and stratification, which offer a framework for theorizing about how race and gender hierarchies interact in labor markets in response to job shortages. We then integrate insights from the psychological and sociological literatures on prejudicial group attitudes.

A key theoretical argument is that racial identities are produced goods, responsive to shifts in the social and economic costs and benefits of holding such identities (Darity, Mason, and Stewart 2006). In the case of race (gender identity is discussed below), individuals sort along a continuum between two extreme identity formations, racialized and individualist. Racialists choose to identify with their own social group, and engage in collective action with those of similar identity to limit the outside group’s access to and control over resources. They may do this explicitly by limiting job access, for example, or implicitly, by inculcating and perpetuating norms and stereotypes that shape that shape perceptions of “deservingness.” In contrast, individualists, as described by Darity, Mason, and Stewart (2006), have weak group identification and are willing to forgo status rewards that accrue to group conformity. Individualists eschew race identification as a means to assess deservingness in access to and control over material resources. The share of the population that identify as racialists or individualists responds to changes in material rewards for group identification.

We can hypothesize that as the net benefits of group identification rise, the share of the population identifying as racialists will increase, with accentuated racist norms that translate into discriminatory behavior in evidence. Macro-level influences may thus

play an important role in attenuating or accentuating racialized behavior and racism by altering the costs and benefits of group identity. Jobs are a prized economic asset, and job scarcity is likely to accentuate the incentive of the dominant group to use racialized norms to improve their position in the job queue.

We might thus expect that during economic booms that produce broadly shared increases in income and employment opportunities, the share racialists in the population will decline since the costs of holding an individualist identity decrease. In contrast, economic contractions may lead to an increase in the share of racialists in the population, palpably measured as a rise in discrimination in job access. Sustained economic contractions or stagnation might be expected to lead to racial hysteresis effects, resulting in a larger share of racialists in the population as has emerged in Europe during the recent years of high unemployment and accentuated by the global crisis of 2008.⁶

Population density of the subordinate group may have also act as a longer run macro-level factor that determines the share of the dominant group with racialized identities. Holding constant other macro-level conditions (including rules on property ownership, legal consequences of discriminatory behavior, and so forth), the higher the population density of the subordinate group, the greater the perceived benefit to the dominant group of a racialized identity, which serves to limit competition over material resources.

Contact and *threat* theory offer hypotheses that describe special cases of the dominance of individualist or racialist identity norms.⁷ Contact theory is associated with the work of Gordon Allport (1954) who held that race prejudice is an idiosyncratic individual attitude, based on factually incorrect stereotypes which develop from the human propensity to categorize and summarize information. Allport proposed structured contact on equal footing, sanctioned and supported by some institutional authority, as a means to overcome prejudice. Contact theory's basic premise is that increases in intergroup contact, under structurally equitable conditions, should lead to a revision of faulty stereotypes, reducing White prejudice against Blacks.

Challenges to Allport's contact theory emerged early on. Herbert Blumer (1958) posited that race prejudice is not simply an individual state of mind, but rather, reflects a

sense of group position. A feeling of superiority and hence a proprietary claim to privileges and advantages in certain areas, as well as fear that the subordinate group will threaten those advantages, undergird this prejudice. Following on Blumer's work, Blalock (1967) advanced a theory of group threat or competition (also called the visibility-discrimination hypothesis) to explain why racial inequality is higher in geographic areas with large concentrations of Blacks. The latter approach has led to a large body of work on threat theory, evaluating the conditions under which Whites perceive Blacks a threat to White sense of group privilege.

Contact and threat theory reflect opposing predictions about the impact of interracial contact on the tendency to discriminate against Blacks. A possible resolution to these apparently contradictory theories is explored in a number of studies that find "threshold" effects, with prejudice initially declining (increased contact causes Whites to revise negative stereotypes) and then rising (the threat of competition is accentuated) as Black population share rises (Forman 2003; Fossett and Kiecolt 1989; Taylor 1998). Evidence of a concave function is contradicted, however, by evidence that the threat effect dominates at low percentages of Blacks in the population, and contact theory holds sway at higher Black population shares.⁸ This suggests a convex function of prejudice plotted against the percentage of Blacks in the population. These results suggest that we may expect to find non-linearities in the relationship between monetary policy variables and race-based employment outcomes and that it may be critical to examine multiple thresholds in this regard.

As compared with attitudinal measures of prejudice, these findings on material outcomes suggest a positive (linear) relationship between Black share of the population and racial economic inequality. There has, however, been little discussion of threshold effects in this body of work that has been so prevalent in attitudinal studies. For the purposes of the current study, we posit that if negative threat effects undermine the benefits of contact under conditions of job scarcity, the impact of contractionary monetary policy will be more racially in evidence. This implies the hypothesis that the ratio of Black to White male unemployment rates will rise as the Black share of the population increases.⁹

Gender and threat effects

Similar to racial identity formation, gender identities may fall along a continuum from masculinist to gender egalitarian. A masculinist identity reflects a patriarchal stance on gender relations, with adherents engaging in implicit or explicit collective action to ensure disproportionate economic and social power accrues to males (Braunstein 2008). Gender egalitarians, in contrast, adhere to norms that do not privilege one gender's resource control over another's.

Masculinists use their material and power advantage to maintain their preferential position in the construction of gender ideology, norms and stereotypes that justify inequality (Blumberg 1984; Chafetz 1989). Conditions of resource scarcity might intensify the prevalence of masculinist identities among the population, leading to greater discrimination in job access. For the purposes of this study, we accordingly hypothesize that contractionary monetary policy leads to increases in the female to White male unemployment rate ratio.

How do tendencies towards race and gender stratification and inequality interact, particularly under conditions of job scarcity? Gender and racial discrimination could be seen as complements, such that all women and Black men face relatively similar disadvantages in job access during economic downturns.

There is, however, evidence of job competition between White women and Blacks. Waldinger (1997) cites research indicating that employers make hiring decisions based on a hierarchy of race/ethnic preferences with Whites (including White women) at the top followed by Hispanics and Blacks. In interviews with employers, Moss and Tilly (2001) also find a preference for hiring White women over other groups in labor markets where job skills have risen, with Blacks perceived more negatively.

These studies suggest the plausibility of "nested" hierarchies of unemployment contingent on the degree of ethnic heterogeneity at the state level. More specifically, dominant groups (White men) may prefer to allocate joblessness to racially subordinate groups than to women of the dominant ethnic group. A rationale for this preference ranking is offered by a Black supervisor in Button and Rienzo (2002: 16): "Hiring White women is a White man's way of making sure Whites stay on top." White male racialists have a material incentive to shift the burden of joblessness to Black men and women over

White women, thus mitigating White family income losses. In short, when it comes to discrimination, race may well invoke a greater penalty than gender.

The dynamics of race and gender stratification discussed here suggest three testable hypotheses. The first is that Blacks and (all) women fare worse relative to White men when contractionary monetary decisions raise the policy interest rate, creating conditions of job scarcity. We also test for the possibility that Black women are more negatively affected by contractionary monetary policy than White women. Second, to the extent threat effects influence outcomes, we hypothesize that the Black/White unemployment rate ratio is positively correlated with Black population density. Third, we explore the possibility that racial hierarchies dominate gender hierarchies by assessing the impact of Black share of the population on the ratio of female to White male unemployment rates.

IV. Empirical analysis

The modeling approach

The empirical model we construct has the primary goal of assessing the distributional impact of contractionary monetary policy on Blacks and women relative to White men. We test effects by gender and race separately, using as the dependent variable the ratio of all female to White male unemployment rates and Black to White male unemployment rates, respectively. Employing a panel data set of U.S. states, we are able to take into account fixed effects, that is, unobserved state-level differences that may influence outcomes.¹⁰ For example, gender effects may be more pronounced in states where conservative religions (and thus norms that define traditional gender roles) dominate, and states in the Deep South may be more resistant to racial equality in employment than other regions.

We focus the analysis on one of the primary monetary policy instruments used by the Federal Reserve: the federal funds rate, the interest rate on overnight loans between banks. The Federal Reserve attempts to influence macroeconomic outcomes by raising and lowering the federal funds rate in response to changes in inflation, economic performance, and employment. In this paper, we analyze the impact of the federal funds rate on the relative unemployment rates of different social groups. The federal funds rate

impacts unemployment by influencing the macroeconomic performance of the U.S. economy as a whole. However, our panel data is disaggregated to the state level. Therefore, one challenge is to distinguish the impacts of macroeconomic policies that operate at the national level from regional economic dynamics that may operate independently of national policy and which vary from state to state. We discuss our approach to this problem in the following section.

Data

We assembled a panel dataset for each of the 50 states covering the period 1979 to 2008 using four sources: the Current Population Survey (CPS), the Bureau of Economic Analysis (BEA), the Federal Reserve Board of Governors, and the Bureau of Labor Statistics (BLS).¹¹ Annual labor market statistics, including state-level disaggregated estimates of employment, unemployment, and labor force participation by race, gender, and ethnicity, were calculated directly from the CPS source data for each year. The BEA produces state and national level estimates of GDP. The Federal Reserve was our source for interest rate data (the federal funds rate), and the BLS maintains the U.S. consumer price index, which we used to calculate annual nationwide inflation rates.

Merged CPS data on the outgoing rotation group were used to estimate the annual state-level labor market statistics, disaggregated by race/ethnicity and gender.¹² We apply the methodology developed by the Center for Economic and Policy Research (CEPR) to classify individuals into four mutually exclusive racial/ethnic groups: White, Black, Hispanic, and other. Because of the small sample size in the out-going rotation group, reliable estimates of the unemployment rate for Blacks were not possible in states with very low Black shares of the state population. Since the construction of our dependent variable requires an estimate of the Black unemployment rate over time, we dropped states from our sample if there were more than 10 missing observations due to excessively small samples. This resulted in 12 states being dropped, all of which have very small Black population shares: Hawaii, Idaho, Maine, Montana, New Hampshire, New Mexico, North Dakota, Oregon, South Dakota, Utah, Vermont, and Wyoming.

To distinguish macroeconomic dynamics that affect aggregate output at the national level from state-specific changes in economic activity, we regressed state-level

GDP growth on national level GDP growth using a simple fixed effects model. We then captured the residuals (both the random errors and the fixed effects components of the error term) and used these residuals as an indicator of state-level changes in real economic activity, removing the impact of variations at the national macroeconomic level.

Times series data potentially suffer a problem of non-stationarity, which, if not corrected, can bias results. We therefore conducted unit root tests for all variables. Detailed discussion of the methodology used is provided in the appendix, with test results summarized in Table A.1. We rejected the presence of a unit root in all cases.

Analysis

To estimate whether the reaction of unemployment to the federal funds rate differs between race groups, we use the panel dataset to estimate the following relationship:

$$U_{it}^{BWM} = \beta_0 + \beta_1 FFR_t + \beta_2 LFPR_{it}^{BWM} + \beta_3 gr_{it} + \beta_4 BLSH_{it} + \beta_5 BLSH_{it}^2 + \eta_i + \varepsilon_{it} \quad (1)$$

where U^{BWM} represents the ratio of the total Black unemployment rate to the White male unemployment rate; the subscripts i and t index states and years, respectively; FFR is federal funds rate (the nominal rate less the rate of inflation);¹³ $LFPR^{BWM}$ is the ratio of Black to White male labor force participation rates; gr is the state-level growth of output after the impact of national level growth dynamics have been removed; $BLSH$ and $BLSH^2$ are the Black share of the population and Black share squared, respectively; η is the component of the disturbance term associated with state-specific effects; and ε is a random error term.

We estimate a parallel equation to explore whether the reaction of unemployment differs between men and women:

$$U_{it}^{FWM} = \beta_0 + \beta_1 FFR_t + \beta_2 LFPR_{it}^{FWM} + \beta_3 gr_{it} + \beta_4 BLSH_{it} + \beta_5 BLSH_{it}^2 + \eta_i + \varepsilon_{it} \quad (2)$$

where the variables are defined analogously to those of equation (1), except that U^{FWM} refers to the ratio of the total female unemployment rate to the White male

unemployment rate, and $LFPR^{FWM}$ refers to the ratio of female to White male labor force participation.

It is useful to consider potential endogeneity of two variables, the federal funds rate and relative labor force participation rates. With regard to the former, we deem endogeneity concerns to be negligible. The Fed is unlikely to propose national adjustments to the federal funds rate in response to state-level changes in the unemployment rate ratio, given the degree of heterogeneity among the states.

In contrast, labor force participation rates may indeed vary inversely with unemployment, capturing the “discouraged worker” effect. Our motivation for including labor force participation as an explanatory variable is to correct a potential bias with unemployment rates as conventionally measured. Note that if high unemployment reduces labor force participation, standard unemployment rates underestimate the effect of monetary policy because lower labor force participation reduces measured unemployment. In that sense, our regression results produce a lower bound estimate of unemployment effects. More succinctly, the labor force participation variable addresses an issue about the measurement of unemployment; it is not a direction of causality issue (the usual endogeneity problem).¹⁴

Equations (1) and (2) directly incorporate the Black population share as an explanatory variable. Since the squared population share is also included, the relationship is non-linear. This represents one strategy for modeling non-linearities in terms of the unemployment rate ratios. However, the coefficients on the other variables, most notably the real federal funds rate, remain constant with variations in the Black population share. An alternative approach to capturing non-linearities in the responsiveness of relative unemployment rates to monetary policy decisions is to develop threshold models in which the coefficients themselves are allowed to vary when the Black population share falls above or below certain thresholds.

Therefore, we test for threshold effects of Black share of the population on unemployment rates. We anticipate that the estimated coefficients will vary depending on the Black share of the working age population. However, we treat the thresholds at which the structure of the relationships changes as unknown. Therefore, as a first step, we must estimate the thresholds of the Black population share at which the relationship between

our macroeconomic policy variable, the federal funds rate, and differential race and gender outcomes changes. In other words, we estimate equations that are similar to Equations (1) and (2) above, but which exclude the Black labor share from the specification. Instead, we generate different estimates of the model for states whose Black population shares fall above or below particular thresholds. Specifically, we explore one-threshold and two-threshold models to determine which approach produces the estimates which best fit the data.

To maintain a minimum number of observations, we additionally required that any division based on the threshold retained at least 4 states. This requirement places an upper limit on our thresholds of approximately 28 percent. In only four states does the Black share exceed 27 percent: Georgia, Louisiana, Mississippi, and South Carolina. For the one threshold model, we estimate a series of equations, allowing the threshold, τ , to vary from a low of one percent to a high of 28 percent. For each value of τ , we estimate two equations – one for all states whose average Black population share falls below τ and one for states whose population share is greater than or equal to τ . The set of estimates with the highest regression sum of squares is taken as the best fit and determines the value of τ we use in this analysis.

A similar procedure is used in the two-threshold model, except that we have two unknown thresholds, τ_1 and τ_2 . We allow τ_1 to vary between one percent and 28 percent – again, imposing the requirement that each sub-group of states must contain at least four states. For each value of τ_1 , we allow τ_2 to vary throughout a similar range as long as $\tau_2 > \tau_1$ for any given τ_1 . For each value of τ_1 and τ_2 , we estimate three equations: one for states whose Black population share falls below τ_1 , a second for states whose Black population share is greater than τ_1 but less than τ_2 , and a third for states whose Black population share is greater than or equal to τ_2 . Our estimates of the values of τ_1 and τ_2 are those that maximize the total regression sum of squares.

For the models with the Black to White male unemployment rate ratio as the dependent variable, we found that the two-threshold model had the best fit. The thresholds that maximized the sum of squares of the regression were 11 percent and 25 percent. Table 1 reports these results and compares the regression sum of squares of the two-threshold model with those of the one threshold model and of a model with no

thresholds imposed (using the same specification, but the full set of states with adequate data). In the case of the one threshold model, the threshold value that maximized the regression sum of squares was 25 percent.

Interestingly, the two-threshold model provides the best fit for the gender models, with the female to White male unemployment rate ratio as the dependent variable. The thresholds that maximized the sum of squares of the regression were 14 percent and 25 percent. These thresholds are close to those from the Black/White male model. This suggests that structural changes that are associated with different Black population shares affect the estimated relationships in both the race and gender models at similar threshold levels. For comparative purposes, we also examined a two-threshold model for the female/White male relationship using the same thresholds from the Black/White male unemployment rate regressions (11 percent and 25 percent). The regression sum of squares is slightly lower than when the thresholds are set at 14 percent and 25 percent, but the difference is negligible. These results are summarized in Table 1.

Table 1. Estimates of Black population share thresholds, total regression sum of squares

Estimation	Regression Sum of Squares
Ratio of Black to White male employment	
No threshold	10.42
One threshold (25%)	15.91
Two thresholds (11% and 25%)	21.62
Ratio of female to White male unemployment	
No threshold	2.77
One threshold (25%)	4.94
Two thresholds (14% and 25%)	6.32
Two thresholds (11% and 25%)	6.28

Table 2 presents the detailed coefficient estimates of the basic models and the two-threshold fixed effects models with thresholds of 11 percent and 25 percent for the Black/White male regressions and 14 percent and 25 percent for the Female/White male regressions. Columns 1 and 5 present estimates of the model without threshold effects as described in Equations 1 and 2 for relative unemployment rates of Blacks and females, respectively (with the Black population share entering as a non-linear explanatory variable and including. Columns 2-4 and 6-8 give results of the two-threshold models with Blacks and female relative unemployment rate ratios as the dependent variables, respectively (and with the Black population share omitted as an explanatory variable since it is used to determine the relevant thresholds).

Consider first the estimates of the determinants of the Black/White male unemployment rate ratio. Column 1 shows the estimated coefficients for all states. The constant term is 2.291, consistent with past research indicating the Black/White unemployment rate ratio hovers around 2. In addition, increases in the federal funds rate exert a positive significant effect on this ratio. Ethnic differences in labor force participation do not have a significant effect on the dependent variable, nor does the adjusted state growth rate. Interestingly, neither the Black share of the population nor its square is statistically significant. The estimated coefficients for states with a Black population share of less than 11 percent are given in Column 2. In this group of states, none of the coefficients are statistically significant, with the exception of the constant term. In particular, the coefficient on the federal funds rate is not statistically different from zero. Column 3 presents similar estimates for states whose Black population share lies between 11 percent and 25 percent. There is a positive and significant relationship between the real federal funds rate and the ratio of Black to White male unemployment in this group of states. A higher real interest rate tends to increase Black unemployment relative to White male unemployment. This relationship becomes even stronger when the Black population share exceeds 25 percent (column 4). The magnitude of the estimated coefficient is larger and remains statistically significant. These results are consistent with the threat hypothesis, whereby exclusion and discrimination against Blacks increases with a rising Black share of the population.

Table 2. Estimated coefficients of two-threshold model, fixed effects

Explanatory variables	Black/White male unemployment rate ratio				Female/White male unemployment rate ratio			
	(1) Full sample	(2) <11%	(3) 11% to 25%	(4) >25%	(5) Full sample	(6) <14%	(7) 14% to 25%	(8) >25%
Constant	2.291 (0.61)*	3.045 (0.65)*	3.847 (0.60)*	-2.179 (2.41)	0.245 (0.31)	0.318 (0.15)*	2.798 (0.58)*	-1.826 (1.45)
Federal funds rate	0.031 (0.01)*	0.009 (0.01)	0.048 (0.01)*	0.071 (0.02)*	0.024 (0.01)*	0.019 (0.003)*	0.002 (0.01)	0.086 (0.02)*
Labor force participation rate	-0.610 (0.62)	-0.661 (0.75)	-1.869 (0.67)*	5.900 (2.82)	0.695 (0.40)	0.901 (0.12)*	1.776 (0.68)*	4.169 (1.77)
State growth	-0.701 (0.70)	-0.021 (0.78)	3.852 (1.21)*	-0.304 (0.708)	0.131 (0.24)	-0.143 (0.21)	1.695 (0.45)*	1.076 (0.27)*
Black share	7.608 (6.15)				3.695 (2.04)*			
Black share squared	-11.255 (12.79)				-4.754 (4.24)			
Number of states	38	21	13	4	38	27	7	4
N	1088	595	377	116	1102	783	203	116
Regression sum of squares	12.711	2.367	14.637	5.183	3.337	1.280	1.627	3.590

Note: Robust standard errors in parentheses. * indicates p-value less than or equal to 5%.

Note that the coefficient on state-level growth dynamics (controlling for national-level growth) is positive and statistically significant in states with a Black population share between 11 and 25 percent. This suggests that faster regional growth, controlling for national level growth, raises the ratio of Black to White male unemployment. In other words, the Black population experiences a disproportionately smaller boost to employment from regional sources of growth in states with a Black population share between 11 and 25 percent. Noting that the coefficient on this variable for the other threshold groups is negative, but not statistically significant, these results suggest that racially-based job exclusion does indeed depend on the share of Blacks in the population.

Turning to the female/White male results for all states for which we have sufficient data on Black unemployment in column 5, here, too, the coefficient on the real federal funds rate is positive and significant, though smaller than the size of the coefficient in the corresponding Black/White male regression. Note also that the constant term is substantially lower, and is not statistically different from zero. The only other significant variable in that regression is the Black share of the population. It is positive, indicating that the women's unemployment rate relative to White males rises linearly with increases in the Black share of the population. This is consistent with a hypothesis of job competition, possibly due to the crowding of women and Blacks into a limited number of job slots, relative to White men.

In the threshold equations with the female to White male unemployment rate ratio as the dependent variable (columns 6-8), we find that the federal funds rate variable is positive and statistically significant when the Black population share is below 14 percent or above 25 percent. In the middle range, this coefficient is not statistically different from zero. For states with a low (less than 14 percent) Black population share, the coefficient value is 0.019. This effectively drops to zero for states with a Black population share between 14 percent and 25 percent. However, for states with average Black population shares greater than 25 percent, the size of this coefficient increases to 0.086. Moreover, in states with Black population shares in excess of 14 percent, state-level growth dynamics exert a positive and statistically significant impact on the ratio of female to White male unemployment. Thus, similar to the impact of economic growth on Blacks, women seem to be last hired during economic upturns, at least in states with a Black population share greater than 14 percent.

Table 3 presents two sets of variations on the female/White male unemployment rate ratio equations. First, we impose the same thresholds (11 percent and 25 percent) as we applied to the Black/White male unemployment rate equations in Table 2 in order to facilitate race/gender comparisons. These estimates are presented in columns 1-3 in Table 3. Note that the coefficient estimates on the federal funds rate variable behave in a very similar fashion to those presented in Table 2 with thresholds of 14 percent and 25 percent. Interestingly, several of the coefficients on the remaining variables lose some statistical significance when the threshold changes. It is noteworthy that for the group of

states with a Black share ranging from 11 to 25 percent, Blacks disproportionately feel the negative effects of contractionary monetary policy relative to White men, but this is not so for all women. However, the coefficient on the real federal funds rate increases in magnitude and becomes statistically significant for both Blacks and women when the Black population share exceeds 25 percent. This is interesting and may suggest that “threat” effects become stronger in highly heterogeneous populations with the negative outcomes of these dynamics felt by both women and Blacks when the Black population share exceeds a critical threshold.

We should note that some caution should be observed in making these comparisons. That is because our two dependent variables represent overlapping groups. Black women are captured in both dependent variables, although to a much larger extent influence the size of the Black/White male unemployment rate ratio. At thresholds above 25 percent, however, the magnitude of the negative effects of contractionary policy on Blacks and women is similar, with coefficients on the federal funds rate 0.071 and 0.086, respectively.

Table 3 also presents coefficient estimates when all 50 states are included. Recall that we dropped states from the sample because it was not possible to estimate Black unemployment rates for states with very small Black populations. This does not apply to women’s unemployment rates. Therefore, we can include the full set of states in our model of the female/White male unemployment rate ratio. Using the same methodology we discussed earlier, we find that the optimal thresholds again are again 14 percent and 25 percent. Therefore, including the full set of states will only alter the coefficient estimates for states with less than a 14 percent Black population share (Equation 4 in Table 3). From the results in that table, we observe that the coefficient estimates are quite similar to those in Table 2. The coefficient on the federal funds rate retains its significance and is of approximately the same magnitude. The coefficients on the other variables also have the same signs and statistical significance, although the sizes of these coefficients are slightly different.

Table 3. Estimated coefficients of two-threshold model, fixed effects

Explanatory variables	Female/White male unemployment rate ratio			Female/White male unemployment rate ratio (All 50 states)		
	(1)	(2)	(3)	(4)	(5)	(6)
	<11%	11% to 25%	>25%	<14%	14% to 25%	>25%
Constant	0.251 (0.17)	1.920 (0.47)*	-1.826 (1.45)	0.595 (0.14)*	2.799 (0.58)*	-1.826 (1.45)
Federal funds rate	0.016 (0.01)*	0.012 (0.01)	0.086 (0.02)*	0.016 (0.003)*	0.002 (0.01)	0.086 (0.02)*
Labor force participation rate	0.942 (0.20)*	-0.828 (0.56)	4.169 (1.77)	0.571 (0.17)*	-1.776 (0.68)*	4.169 (1.77)
State growth	-0.122 (0.24)	0.912 (0.53)	1.076 (0.27)*	-0.451 (0.21)*	1.779 (0.68)*	1.076 (0.27)*
Number of states	21	7	4	39	7	4
N	609	203	116	1131	203	116
Regression sum of squares	0.769	2.000	3.590	2.234	1.469	3.559

Note: Robust standard errors in parentheses. * indicates p-value less than or equal to 5%.

Robustness Tests: Controlling for education and employment concentration

Gender and racial differences in unemployment may be due to processes that reflect gender and racial stratification in education and job segregation. For that reason, we carry out a robustness check, controlling for gender and racial differences in the share of respective populations with a college education and the relative shares employment in interest rate-sensitive industries. We identified construction and durable goods manufacturing as the primary interest-rate sensitive industries, following Thorbecke (1997), who employed impulse-response techniques to assess industry-level employment effects in response to federal funds rate shocks. State-level gender and race data on education and employment by industry are from the CPS, as discussed in Section IV.

More specifically, the ratios of the percentage of the labor force with some college/tertiary education by race and gender are measured respectively as:

$$COLL^{BWM} = \frac{\%COLL^B}{\%COLL^{WM}}, \quad COLL^{FWM} = \frac{\%COLL^F}{\%COLL^{WM}}$$

where $COLL^{BWM}$ ($COLL^{FWM}$) is the percentage of Black (female) labor force participants with some college education relative to White males, $\% COLL$ is the percentage of the respective group's labor force participants with some college education, even if they did not earn a degree. Using similar notation, the percentage of Blacks (females) employed in interest-rate sensitive industries, relative to the White male share is:

$$IND^{BWM} = \frac{\%IND^B}{\%IND^{WM}}, IND^{FWM} = \frac{\%IND^F}{\%IND^M}$$

where IND denotes the share of the respective groups employed in interest-rate sensitive industries, and the remaining terms are defined as for education.

We would expect a negative coefficient on the percentage of Blacks (females) relative to White males with a college education, if there are “ladder” effects in job losses during recessions whereby less skilled workers are the first to be laid off.¹⁵ Conversely, as the share of employed Blacks (females) working in interest-rate sensitive industries rises relative to White male concentration in these industries, we would anticipate an increase in the corresponding unemployment rate ratio. This would capture the combined effects of job concentration and the negative impact on employment in industries sensitive to increases in borrowing costs. In addition to providing the means to conduct a robustness check on the federal funds rate variable, inclusion of the additional variables allows us to parse the mechanisms of stratification and employment disadvantage by race and gender into three component parts: discrimination in job access, educational inequality, and job concentration (or segregation).

We consider first the estimates of Black/White male unemployment rate ratios in Table 4. Column 1 shows the coefficients for all states for which there are sufficient data.¹⁶ Coefficients on education and concentration in interest rate-sensitive industries are statistically significant, and, as expected, work in opposite directions. The Black/White proportion of college-educated workers has a negative effect on the unemployment rate ratios, suggesting that part of the raw unemployment gap is explained by White males' greater probability of having a college education. The coefficient on the employment concentration variable indicates that as the relative share of Blacks employed in interest

rate-sensitive industries rises, the Black/White male unemployment rate ratio increases. Controlling for these two variables, we note that the federal funds rate continues to exert a positive significant effect on the unemployment rate ratio, and is somewhat smaller in magnitude than in the regressions that do not control for education and job segregation (0.022 as compared to 0.031).

Table 4. Race and gender results controlling for education and job segregation

Explanatory variables	Black/White male unemployment rate ratio				Female/White male unemployment rate ratio			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full sample	<11%	11% to 25%	>25%	Full sample	<14%	14% to 25%	>25%
Constant	1.583 (0.98)	2.332 (0.85)*	2.453 (1.25)	-3.569 (2.06)	0.047 (0.34)	0.089 (0.15)	2.715 (0.72)*	-1.48 (1.37)
Federal funds rate	0.022 (0.01)*	0.002 (0.02)	0.035 (0.01)*	0.057 (0.01)*	0.022 (0.01)*	0.017 (0.01)*	-0.0002 (0.01)	0.070 (0.02)*
Labor force participation rate	1.330 (0.96)	-0.109 (0.94)	0.531 (1.25)	9.945 (3.14)*	1.176 (0.50)*	1.127 (0.27)*	-1.184 (1.13)	6.009 (1.26)*
State growth	2.064 (1.24)	2.772 (2.02)	3.545 (1.80)	0.141 (1.43)	0.105 (0.25)	-0.107 (0.23)	1.773 (0.45)*	0.616 (1.26)
Black share	2.317 (7.24)				4.314 (2.12)*			
Black share squared	0.0865 (16.89)				-6.068 (4.35)			
College education	-1.560 (0.43)*	-0.860 (0.84)	-1.458 (0.37)*	-2.678 (1.04)	-0.185 (0.09)	-0.040 (0.19)	-0.237 (0.19)	-1.067 (0.22)*
Industry	0.400 (0.19)*	0.579 (0.29)	0.421 (0.22)	-0.161 (0.58)	0.398 (0.18)*	0.446 (0.17)*	0.144 (0.92)	0.455 (0.64)
Number of states	34	17	13	4	38	27	7	4
N	470	144	245	81	1102	783	203	116
Regression sum of squares	17.093	4.124	13.041	7.389	4.221	1.567	1.627	5.268

Note: Robust standard errors in parentheses. * indicates p-value less than or equal to 5%.

The threshold model results (columns 2-4) also indicate that the inclusion of education and employment variables does not significantly alter the significance of the coefficients on the federal funds rate, labor force participation, and state growth in the analogous models in Table 2 although the size of federal funds rate coefficients declines slightly. The education variable is only significant in the states where Blacks comprise 11

to 25 percent of the population, while the job segregation variable is not significant in any of the thresholds models.

The results from the gender regressions (columns 5-8) produce similar results to those for Blacks/White males. The higher the ratio of females to White males with a college education, the lower the unemployment rate ratio, while employment concentration of women in interest-rate sensitive industries relative to White men raises the ratio. The federal funds rate coefficients are slightly lower than in the restricted regressions (columns 5-8 in Table 2), but retain their statistical significance.

V. Black Women, White women, and Black men: Is there a hierarchy within the subordinate groups?

A challenge in assessing the role of gender and race as categories of stratification is that they overlap. Conceivably, our results on the negative effect of contractionary monetary policy on women could be capturing a differentially negative effect on Black women. In an effort to further refine our understanding of stratification dynamics, we re-run the regressions separately for Black and White women and Black men, all relative to White men.

The full results are presented in Tables A.2 and A.3 in the appendix. Our discussion here is confined to the effect of the federal funds rate on the unemployment rate ratio of Black and White women and Black men, relative to the White male unemployment rate. Table 5 shows results for the basic regressions as well as the regressions augmented with controls for education and employment. In all regressions, the interest rate effect is positive and significant. The size of the effect, however, differs systematically by race and gender. Recognizing that comparisons between all women and Blacks are problematic because Black women are members of both groups, we note that the impact of contractionary monetary policy weighs more heavily on Blacks than on women, regardless of whether or not job concentration and education controls are included.

Table 5. Summary of federal funds rate effects by race and gender

	Basic regressions	With industry and education controls
Female/White Male	0.024*	0.022*
All Black/White male	0.031*	0.022*
Black male/White male	0.028*	0.029*
Black female/White male	0.043*	0.039*
White female/White male	0.019*	0.015*
Coefficient ratios		
All Black/White female	1.84	2.00
Black female/White female	2.26	2.60
Black male/White female	1.47	1.93

Note: * indicates p-value less than or equal to 5%.

Disaggregating by race and gender, we observe that while Blacks disproportionately bear the costs of unemployment induced by contractionary monetary policy relative to White women, that burden is heaviest for Black women. These results are consistent with research that shows Black women bear an additional wage penalty due to the intersection of being both Black and female (Kim 2009). Figure 1 provides a visual representation of the differential impact on Black women and men relative to White women as the federal funds rate rises.

Race and Gender Stratification: Substitutes or Complements?

We posited that there may be a relationship between Black and female relative unemployment rate ratios, and in particular that female rate ratios might fall as Black population share rises. This would suggest that in states with relatively ethnic homogeneity, women would bear a disproportionate share of unemployment resulting from the negative impact of interest rate hikes on aggregate demand, relative to White men. But as the Black share of the population rises, we hypothesized that the job costs of contractionary monetary policy would be shifted to Blacks, consistent with threat theory.

Figure 1. Impact of one unit increase in federal fund rates on Black and female unemployment rate ratios, disaggregated

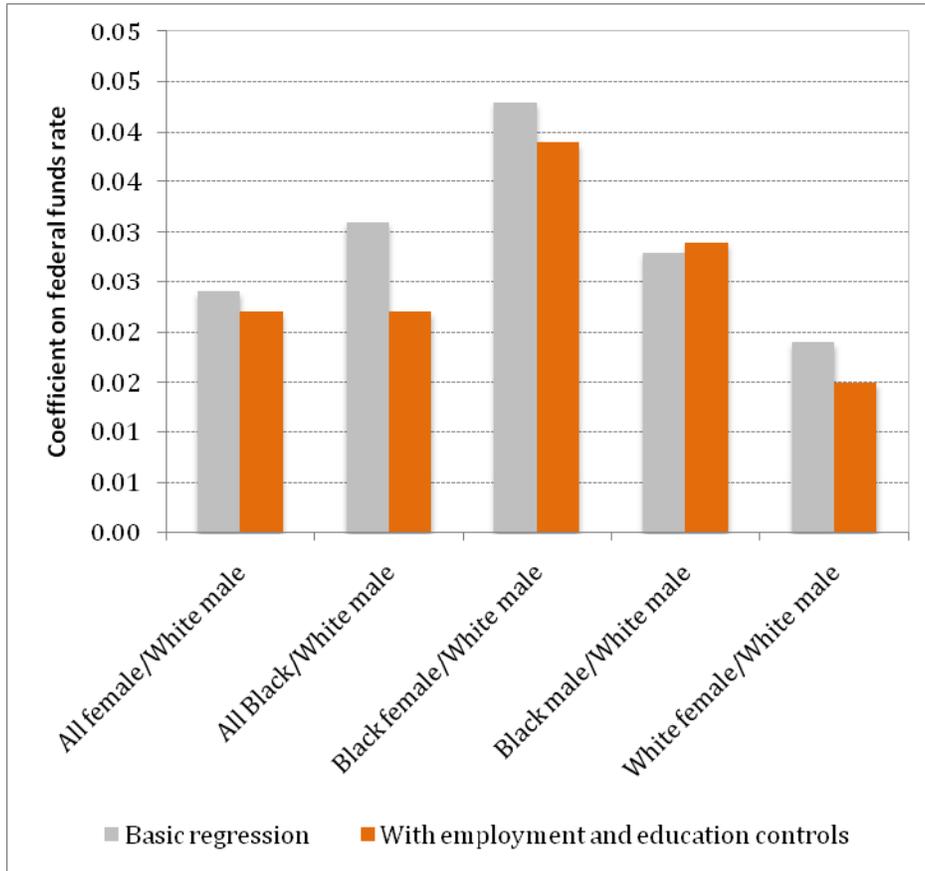
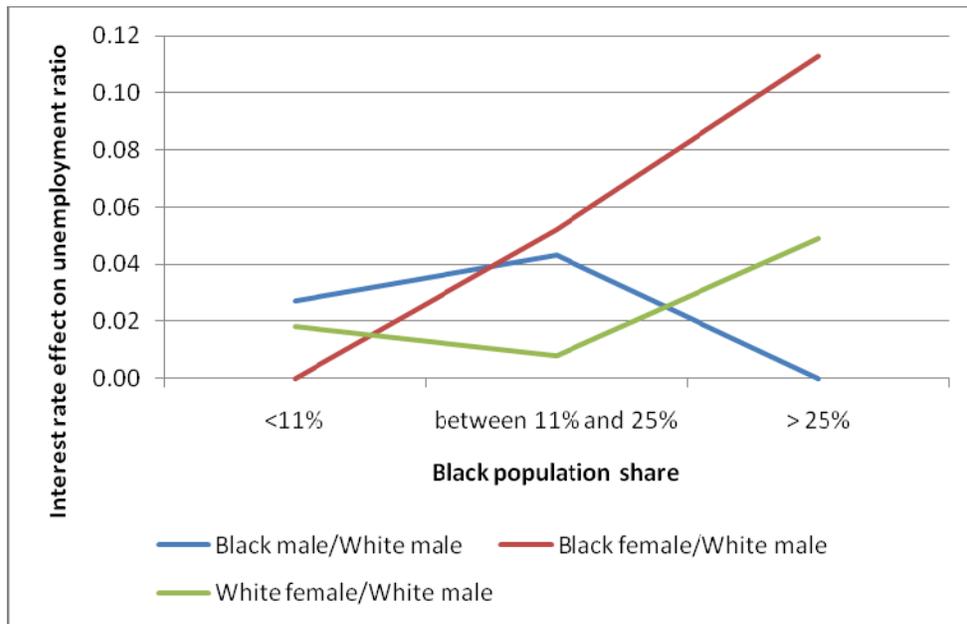


Figure 2 is constructed using the data in Tables A.2 and A.3 to compare Black female and male to White female interest rate effects as black population share rises. We score coefficients with a $p < 10$ percent as 0. At Black population shares below 11 percent, the effect of a hike in the federal funds rate on the unemployment rate ratio of the subordinate group to White males suggests the following hierarchy: White male and Black females, followed by White females and then Black males. However, in states with Black population shares ranging from 11 percent to 25 percent, Black women especially and then Black men are substantially more likely than White women to be put at the back of the job queue, all relative to White men, when contractionary monetary policy is pursued. At population shares above 25 percent, negative race effects dominate, with Black women experiencing more than twice White women's unemployment penalty,

relative to White men. It is also suggestive of the likelihood that job competition amongst White women and Blacks is accentuated, potentially due to job crowding.

Figure 2. Disaggregated Comparison of Interest Rate Effects on Unemployment Rate Ratios by Black Share of Population



We note, however, that only four states have Black population shares in excess of 25 percent, and therefore focus on the trend of coefficients as population share rises from under 11 percent up to 25 percent. The results for this group of states suggest that racialized identity norms dominate, consistent with the threat hypothesis. Thus, at low Black population shares, White men, whether as employers or workers able to influence hiring and firing decisions, shift the burden of monetary policy induced unemployment to White women and Black men. But as the Black population share rises, the burden of unemployment shifts heavily away from White women and toward Blacks, both male and female. That is, racialized norms that gives Whites preferential access to jobs appear to dominate over gender norms which infer that men are more deserving, when jobs are scarce.

VI. Conclusions

We can conclude from this analysis that monetary policy is neither race- nor gender-neutral. It weighs heavily on both Blacks and White women, with a significantly greater penalty for being Black. Racial and gender differences in college education and job concentration in interest rate-sensitive sectors do not explain away the differentially negative impact of monetary policy on Blacks and White women. The results presented here highlight that gender analysis, at least in the context of an ethnically heterogeneous society such as the US, requires attention to potentially differential effects by ethnicity that may be stronger than gender differences.

Another implication of our results is that the distributional effects of the Fed monetary policies should inform their decision-making. Given the long-term impact of unemployment on adults and their children (Darity and Goldsmith 1996), we might indeed be concerned about whether monetary policy contributes to the reproduction of poverty and inequality between Whites and Blacks, and women and men, in particular women who are lone mothers. The long-run negative effects of inequality have been established in a variety of studies. The Fed's failure to note the distributional consequences of its policy actions may in fact contribute to long-run inflationary pressures, resulting from the slowdown in labor productivity growth that inequality produces.

APPENDIX

Panel Unit Root Tests

We tested all the variables in our panel for unit roots using Fisher-type panel unit root tests with an augmented Dickey-Fuller specification applied to the individual cross-sections. We used the Fisher test because our panel is slightly unbalanced due to occasional missing observations for certain race-disaggregated variables. As described in the main text of the paper, we dropped states with over 10 missing observations in their individual time series. Having done this, some states with low Black population shares still have one or two missing observations for particular years. Since other unit root tests (for example, Im, Persaran, and Shin) require precisely balanced panels, we used the Fisher-type test.

Table A1 summarizes the results of the Fisher panel unit root tests. The Fisher test assumes an AR(1) process in the specification of the underlying Dickey-Fuller specification. Columns (1) and (2) of Table A1 report the results of the basic Fisher test, with Column (2) incorporating a deterministic time trend. Columns (3) and (4) augment the basic Fisher test with an additional lagged difference term, with Column (4) including a deterministic time trend.

The results of the test show that the vast majority of variables are stationary (that is, have no unit root) across the different specifications. The ratio of the percent of college educated women to the percent of college educated White men ($COLL^{FWM}$) is trend stationary – that is, we can reject the null hypothesis of a unit root when a deterministic trend is included. The ratio of Blacks in interest rate sensitive industries (IND^{BWM}) appears to be non-stationary in the basic specification (Column 1), but other tests reveal no evidence of a unit root (Columns 2-4). The only variables with somewhat ambiguous test results are the ratio of women's labor force participation rates to White male labor force participation ($LFPR^{FWM}$) and the ratio of White women's labor force participation rates to White male rates ($LFPR^{WFWM}$). The panel is perfectly balanced with regard to these two variables, so we also performed the Im, Persaran, and Shin panel unit root test using various specifications. We rejected the presence of a unit root in all cases. Therefore, we assumed that these two variables were non-stationary for the purposes of our analysis.

The real federal funds rate is the only variable which is invariant across states. Therefore, we use standard augmented Dickey-Fuller (ADF) unit root tests to examine the stationarity of this variable for the single time series. The tests reveal the real federal funds rate to be trend stationary – that is, the test statistic rejects the presence of a unit root in an ADF specification which includes a determinist trend. The ADF test statistic is -5.07 with a p-value of less than 0.002. (One additional lagged difference term was added based on the Schwartz information criterion).

Table A1. Fisher-type panel unit root tests, χ -squared test statistics (p-values in parentheses)

	(1)	(2)	(3)	(4)
U^{FWM}	733.9 (p<0.001)	618.1 (p<0.001)	341.1 (p<0.001)	272.4 (p<0.001)
U^{BWM}	663.0 (p<0.001)	576.6 (p<0.001)	348.1 (p<0.001)	285.3 (p<0.001)
$LFPR^{FWM}$	88.1 (p=0.16)	113.2 (p=0.004)	107.1 (p=0.01)	64.2 (p=0.83)
$LFPR^{BWM}$	242.8 (p<0.001)	316.5 (p<0.001)	168.4 (p<0.001)	213.5 (p<0.001)
Gr	388.3 (p<0.001)	293.4 (p<0.001)	337.3 (p<0.001)	213.9 (p<0.001)
BLSH	136.4 (p<0.001)	166.3 (p<0.001)	120.4 (p<0.001)	161.5 (p<0.001)
$COLL^{FWM}$	71.6 (p=0.62)	296.3 (p<0.001)	62.8 (p=0.86)	293.8 (p<0.001)
$COLL^{BWM}$	225.4 (p<0.001)	260.1 (p<0.001)	165.5 (p<0.001)	228.1 (p<0.001)
IND^{FWM}	286.4 (p<0.001)	515.9 (p<0.001)	155.9 (p<0.001)	314.7 (p<0.001)
IND^{BWM}	51.0 (p=0.43)	80.1 (p=0.004)	63.8 (p=0.01)	148.2 (p<0.001)
U^{BFWM}	677.7 (p<0.001)	587.8 (p<0.001)	301.1 (p<0.001)	250.0 (p<0.001)
U^{WFWM}	849.6 (p<0.001)	748.3 (p<0.001)	429.9 (p<0.001)	376.0 (p<0.001)
U^{BMWM}	785.9 (p<0.001)	675.7 (p<0.001)	429.1 (p<0.001)	358.1 (p<0.001)
$LFPR^{BFWM}$	225.0 (p<0.001)	311.8 (p<0.001)	168.9 (p<0.001)	216.6 (p<0.001)
$LFPR^{WFWM}$	96.2 (p=0.06)	107.6 (p=0.01)	99.3 (p=0.04)	65.6 (p=0.80)
$LFPR^{BMWM}$	498.1 (p<0.001)	439.0 (p<0.001)	329.9 (p<0.001)	292.5 (p<0.001)

Note: Column 1: AR(1) process, no deterministic trend. Column 2: AR(1) process, deterministic trend. Column 3: AR(1) process with additional lagged difference term, no deterministic trend. Column 4: AR(1) process with additional lagged difference term, deterministic trend.

Table A.2 Black women and men and White women's unemployment, relative to White men

Explanatory variables	Black female/White male unemployment rate ratio				White female/White male unemployment rate ratio				Black male/White male unemployment rate ratio			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Full sample	11%	11% to 25%	>25%	Full sample	11%	11% to 25%	>25%	Full sample	11%	11% to 25%	>25%
Constant	0.834 (0.636)	1.615 (0.42)*	3.653 (0.57)*	0.051 (1.79)	0.497 (0.19)*	0.294 (0.17)	1.478 (0.22)*	-0.725 (0.67)	3.716 (0.92)*	4.274 (0.84)*	1.899 (0.86)*	0.249 (1.54)
Federal funds rate	0.043 (0.01)*	0.007 (0.01)	0.052 (0.01)*	0.113 (0.04)*	0.019 (0.004)*	0.0179 (0.003)*	0.008 (0.003)*	0.049 (0.02)	0.028 (0.01)*	0.027 (0.01)*	0.043 (0.006)*	-0.022 (0.03)
Labor force participation rate	0.442 (0.48)	0.977 (0.49)*	-1.887 (0.64)*	3.097 (2.07)	0.526 (0.23)	0.680 (0.21)*	0.977 (0.50)	2.147 (0.77)	-1.447 (0.76)	-1.948 (0.89)*	-0.285 (0.27)	3.33 (1.71)
State growth	0.766 (0.59)	0.033 (0.65)	3.935 (1.56)*	1.543 (1.27)	-0.211 (0.18)	-0.071 (0.22)	0.033 (0.65)	0.649 (0.40)	0.555 (0.93)	0.004 (1.13)	3.244 (1.11)*	-1.942 (1.16)
Black share	15.071 (6.76)*				0.358 (1.47)				-0.866 (8.8)			
Black share squared	-32.102 (12.86)*				1.046 (3.51)				11.389 (19.53)			
Number of states	38	21	13	4	38	21	13	4	38	21	13	4
N	1095	602	377		1102	609	377	116	1095	602	377	116
Regression sum of squares	0.834	4.308	24.201	9.111	2.466	0.974	1.25	1.25	18.849	19.118	6.73	2.304

Note: Robust standard errors in parentheses. * indicates p-value less than or equal to 5%.

Table A.3 Black women and men and White women's unemployment, relative to White men, robustness check

Explanatory variables	Black female/White male unemployment rate ratio				White female/White male unemployment rate ratio				Black male/White male unemployment rate ratio			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Full sample	11%	11% to 25%	>25%	Full sample	11%	11% to 25%	>25%	Full sample	11%	11% to 25%	>25%
Constant	1.846 (1.15)	2.352 (1.08)*	3.04 (1.13)*	-0.183 (1.75)	0.375 (0.22)	0.037 (0.19)	1.508 (0.25)*	-0.359 (0.82)	2.639 (1.04)*	3.249 (0.85)*	2.326 (0.85)*	-0.171 (2.16)
Federal funds rate	0.039 (0.01)*	0.020 (0.22)	0.052 (0.02)*	0.068 (0.01)*	0.015 (0.004)*	0.014 (0.003)*	0.006 (0.003)*	0.041 (0.23)	0.029 (0.01)*	0.038 (0.02)*	0.016 (0.01)	-0.029 (0.04)
Labor force participation rate	1.468 (0.99)	1.143 (1.17)	-0.254 (1.30)	6.72 (2.27)*	1.082 (0.32)*	1.023 (0.32)	-0.041 (0.47)	3.111 (1.00)*	0.136 (0.59)	-0.285 (0.71)	1.118 (1.02)	3.606 (1.52)
State growth	2.065 (1.23)	2.424 (2.30)	3.3 (2.07)	0.091 (1.27)	-0.113 (0.19)	-0.111 (0.23)	-0.147 (0.32)	0.305 (63)	1.002 (1.17)	0.586 (2.13)	3.688 (1.01)*	-1.969 (1.22)
Black share	7.342 (7.76)				0.694 (1.45)				0.985 (8.64)			
Black share squared	-11.672 (17.25)				-1.304 (3.58)				8.305 (19.48)			
College	-2.171 (0.51)*	-1.63 (0.79)	-1.132 (0.47)*	-3.652 (1.01)*	-0.514 (0.20)*	-0.205 (0.24)	-0.531 (0.27)	-1.127 (0.97)	-0.719 (0.27)*	-0.515 (0.29)	-1.682 (0.59)*	-0.175 (1.16)
Industry	-0.009 (0.39)	-0.28 (0.35)	0.522 (0.71)	0.817 (2.91)	0.454 (0.12)*	0.708 (0.11)*	0.114 (0.19)	0.149 (0.32)	0.0831 (0.22)	-0.266 (0.27)	0.354 (0.38)	0.309 (0.49)
Number of states	35	18	13	4	38	21	13	4	38	21	13	4
N	475	149	245	81	1102	609	377	116	971	478	377	116
Regression sum of squares	23.908	3.36	16.009	13.165	3.335	1.673	1.367	1.526	3.335	9.117	14.454	2.623

Note: Robust standard errors in parentheses. * indicates p-value less than or equal to 5%.

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ENDNOTES

¹ There are since signs of a shift in policy stance, however. Influential IMF economists Olivier Blanchard, Giovanni Dell’Ariccia, and Paolo Mauro (2010) argue for allowing inflation targets to rise from 2 percent to 4 percent during normal economic times, so as to create monetary policy space which would allow central banks to lower interest rates during times of crisis.

² The 2008 economic crisis in the US and globally may be interpreted as evidence that women do not necessarily fare worse during downturns. The crisis, which began in the housing sector and spread quickly to the durable goods sector, resulted in job losses first in male-dominated industries. This suggests that the nature of the downturn shapes the gender impact. That said, single mothers’ unemployment rates rival those of men in the US, and the Black male *and* female unemployment rates have increased more than that for White men (Boushey 2009; Grown and Tas 2010).

³ Extensive research, both theoretical and empirical, however, has considered the role of gender and race in influencing job segregation and wage differentials. See, for example, Mason (1999), for a discussion of the impact of White male and White female employment density on individual wages.

⁴ That explanation would appear to be contingent on the nature of the downturn, as evidenced by Hoynes’ (2000) study which found that the 1992 recession led to relatively uniform unemployment effects across skill levels.

⁵ Some research comparing gender and race effects of output shocks has been published, however. Results show that male unemployment rates respond more negatively to unanticipated shocks than female unemployment rates. Similarly, Black unemployment rates experience a larger increase in response to an unanticipated output shock than White unemployment rates (Lynch and Hyclak 1984; Ewing, Levernier, and Malik 2002). Hyclak and Stewart (1995) provide econometric evidence that increases in aggregate demand result in larger declines in Black unemployment rates than White rates.

⁶ The increase in unemployment, combined with ominous discussions of tax increases and budget cuts bolstered the political right in European elections in 2009. Election campaigns were marked by anti-immigrant messages linked to job shortages, with right-wing parties making electoral gains in the Netherlands, Italy, Hungary, Great Britain, and Austria (Margaronis 2009).

⁷ We are grateful to Patrick Mason for this observation (private communication, June 15, 2010).

⁸ Pettigrew and Tropp’s (2006) meta-analysis of intergroup contact theory studies leads them to conclude that although contact under a variety of conditions reduces prejudice, contact under unfavorable conditions may increase prejudice and tensions.

⁹ The anxiety-producing fears of competition may be real or imagined. Bobo (1999: 466) cautions, “Whatever economic or political struggles takes place between racial groups of necessity implicates a psychological attachment, not merely concrete resources. In short, racial conflict can never be purely material from the vantage point of group position theory.”

¹⁰ See Seguino (2009) for empirical evidence on the role of religiosity in influencing gender outcomes.

¹¹ We also have a complete set of data for Washington, D.C. However, given the unique structure of the economy and the high Black share of the city’s population, we treat Washington DC as an outlier and do not include it in this analysis.

¹² We are indebted to John Schmidt of the Center for Economic and Policy Research for his expertise in developing these estimates.

¹³ Unemployment effects of contractionary monetary policy have been found to peak at five quarters, declining thereafter (Christiano, Eichenbaum, and Evans 1996). Nevertheless, we also ran regressions with current and lagged values of the real federal funds rate in order to capture any additional lagged effects. The sum of the coefficients on current and lagged values of the federal funds rate was comparable to the coefficients in the models with only the current federal funds rate. Results available from the authors on request.

¹⁴ Were we to treat this as a standard endogeneity problem, one solution would be to identify instruments that are correlated with labor force participation but are uncorrelated the unemployment rate ratio. Given the difficulty of finding such instruments, the “cure” could bias results much more than using the basic OLS technique identified in equations (1) and (2) above.

¹⁵ Jefferson (2005) explores the responsiveness of skill-based unemployment to monetary policy. He finds that relative educational unemployment (with less skilled unemployment rates in the numerator) responds positively to monetary policy surprises (interest rate increases), controlling for supply shocks and new technical ideas. Jefferson concludes that tight labor markets spur the job prospects of younger, less experienced, and less educated workers, as scrutiny of job applicants fall. Conversely, interest rate hikes that engineer declines in aggregate demand can be expected to reduce job opportunities for the less educated relative to those with more education.

¹⁶ Recall that, due to a limited number of observations, Black unemployment rates could not be consistently estimated for states with very small Black populations. States with large numbers of missing observations were dropped.