

CAMA

Centre for Applied Macroeconomic Analysis

A Closer Look at the Employment Effects of Fiscal Policy Shocks: What Have Minorities Got to Do With it?

CAMA Working Paper 66/2019
September 2019

Wifag Adnan

Economics, NYU, Abu Dhabi and IZA

K. Peren Arin

Zayed University, Abu Dhabi, UAE
Centre for Applied Macroeconomic Analysis, ANU

Aysegul Corakci

Department of Economics, Cankaya University, Ankara, Turkey

Nicola Spagnolo

Economics and Finance, Brunel University London, UK
Centre for Applied Macroeconomic Analysis, ANU

Abstract

We investigate the employment effects of fiscal policy innovations using the narrative approach for different racial/ethnic groups, and separately for recessions and expansions. Our results show that (i) overall, tax shocks have larger effects, in terms of magnitude and significance, on the unemployment rate compared to defense spending shocks, (ii.) fiscal policy shocks have varying employment effects depending on gender, racial/ethnic subgroup and the stage of the business cycle, and (iii) sector, industry and occupational segregation in labor markets by gender, race and ethnicity can explain most of the variation in responses to fiscal policy shocks.

Keywords

JEL Classification

Address for correspondence:

(E) cama.admin@anu.edu.au

ISSN 2206-0332

[The Centre for Applied Macroeconomic Analysis](#) in the Crawford School of Public Policy has been established to build strong links between professional macroeconomists. It provides a forum for quality macroeconomic research and discussion of policy issues between academia, government and the private sector.

The Crawford School of Public Policy is the Australian National University's public policy school, serving and influencing Australia, Asia and the Pacific through advanced policy research, graduate and executive education, and policy impact.

A Closer Look at the Employment Effects of Fiscal Policy Shocks: What Have Minorities Got to Do With it?

By WIFAG ADNAN, K. PEREN ARIN, AYSEGUL CORAKCI AND NICOLA SPAGNOLO*

We investigate the employment effects of fiscal policy innovations using the narrative approach for different racial/ethnic groups, and separately for recessions and expansions. Our results show that (i) overall, tax shocks have larger effects, in terms of magnitude and significance, on the unemployment rate compared to defense spending shocks, (ii.) fiscal policy shocks have varying employment effects depending on gender, racial/ethnic subgroup and the stage of the business cycle, and (iii) sector, industry and occupational segregation in labor markets by gender, race and ethnicity can explain most of the variation in responses to fiscal policy shocks.

* Adnan: Economics, NYU, Abu Dhabi and IZA; Wa22@nyu.edu. Arin: Zayed University, Abu Dhabi, UAE. Centre for Applied Macroeconomic Analysis (CAMA), National Australian University, Australia, Kerim.arin@zu.ac.ae. Eryugur: Department of Economics, Cankaya University, Ankara, Turkey, Aeryugur@cankaya.edu.tr. Spagnolo: Centre for Applied Macroeconomic Analysis (CAMA), National Australian University, Australia; Economics and Finance, Brunel University London, UK, nicola.spagnolo@brunel.ac.uk. We would like to thank Joshua Aizelman, Olivia Cassero, Chetan Dave, Blagoj Gegov, Joseph-Simon Goerlach, Tom Jongsma, Faik Koray, Michael McMahon, and Caroline Williams, as well as the seminar participants in Montpellier Business School, Zayed University, TU Dresden and UAE Department of Finance for their valuable suggestions. All errors are our own. Corresponding Author: Wifag Adnan, NYU, Abu Dhabi, UAE

I. Introduction

The severe financial crisis that beset the world economy in 2008-09 and the unequal and faltering recovery that followed have had a very noticeable impact on the evolution of unemployment in the years that followed. In such an environment, taking necessary measures to prevent persistently high unemployment rates from causing long-term damage to the growth and development prospects of their economies is one of the most urgent imperatives facing governments. Macroeconomic policies may play a significant role in dampening unemployment rates, and thus reducing the risk of hysteresis. For instance, where insufficient aggregate demand threatens to inflame hysteresis, expansionary demand-side policies may be appropriate. Although the majority of studies in the literature concentrate on the role of monetary policy, hysteresis could also be prevented by adopting expansionary fiscal policy or by avoiding fiscal consolidation during the course of a recession (DeLong and Summers, 2012).

To properly evaluate the effectiveness of expansionary fiscal policy in inducing long-run economic growth or in alleviating crises, it is vital to identify and quantify its impact on labor market outcomes. The focus of research in this area has been primarily on the effect of fiscal policy multipliers on output or consumption, with limited attention paid to estimating responses in terms of changes in employment outcomes: unemployment, labor force participation or part-time work. It is hardly surprising that most empirical studies have focused on identifying the effects of fiscal shocks on macroeconomic outcomes, where strong theoretical predictions, (Keynesian models, intertemporal models based on representative agents), can be made¹. Equally, few empirical papers examine the distributional

¹One exception is Shapiro (2006), who investigates the employment effects of phasing in tax cuts by comparing the phased-in tax cuts of 2001 with the accelerated tax cuts in 2003 and finds that economic activity responded much faster in 2003 relative to 2001. An intuitive explanation is that phased-in

effects of fiscal policy with respect to race and ethnicity (Abell, 1990, 1991) and there is even less guidance from the theoretical literature.

Using micro-level data, the primary aim of this paper is to quantify the effects of fiscal policy shocks, i.e. changes in defense spending and in (levels of taxation) tax structure, on the likelihood of unemployment, separately for the three major racial/ethnic subgroups: non-Hispanic Whites, Hispanic Whites and Blacks/African Americans². Fiscal policy measures are estimated using the narrative approach. Specifically, we use the defense measure in Ramey (2016), which derives a novel “defense news” variable that measures the present discounted value of expected change in military spending from 1889 to 2015. Likewise, Romer and Romer (2009) identify the magnitude and direction of a tax change as well as determine the motivation underlying major tax legislations by examining corresponding economic reports and government-related documents. We extend their methodology to argue that there were no exogenous tax changes for the years 2008-2012. These two fiscal policy instruments, combined with the monthly waves of the CPS micro-level data from 1976-2012, allow us to measure the effect of fiscal shocks on the likelihood of unemployment for various subgroups of the US population.

First, we show that the negative effects of tax hikes, (and to some extent increased defense spending), are completely driven by recessionary periods. Furthermore, we find substantive differences in the impact of exogenous fiscal policy instruments on the likelihood of unemployment across race and ethnicity. For example, during recessionary periods, the employment outcomes of non-Hispanic Whites are the most responsive to changes in defense spending that occurred two

tax cuts incentivize firms and workers to delay production until their implementation date, after which productivity gains increase as measured by the employment rate, hours worked, and GDP.

²Thereafter, we will refer to this group as “Black” since some members of this group may identify as Black but not as African American, due to the unique historical experiences of the latter group.

years earlier, while in the case of Blacks and Hispanic Whites the changes are not significantly different from zero. We also find that changes in tax policy have no effect on Blacks' employment outcomes after two years, but have a considerable effect on those of non-Hispanic Whites. Meanwhile, Hispanic Whites are the group most affected by changes in tax policy. These findings raise several concerns about the implementation and design of fiscal policy (measures) instruments. For instance, what are the mechanisms underlying the variation in employment responses to changes in fiscal policy? We show that the uneven allocation of jobs, according to sector, industry, and occupational status, across gender, racial and ethnic groups plays a major role in producing these results.

The findings raise a multitude of other questions that warrant discussion but which will only be partially addressed because they are outside the scope of this paper. For example, if exogenous changes in tax policy have little to no effect on the employment outcomes of Blacks, how does the implementation of tax cuts during recessionary periods, as opposed to increases in government spending, change the overall welfare of this community? How will the choice of fiscal policy instruments impede the relative progress of this group and affect inequality among the subgroups? Furthermore, is it possible to redesign fiscal policies in such a way that all groups have a similar likelihood of benefiting? This is especially important, in light of the fact that many fiscal policy adjustments are not unexpected, but are, in fact, designed to target certain goals, e.g. reduce the deficit, or alleviate the impact of a crisis.

The remainder of the paper is organized as follows: Section II reviews the strands of literature that are related to this paper. Section III provides a closer look at the data used and sheds light on key descriptive statistics for both macro-level and micro-level data. Section IV presents the empirical strategy employed

in the paper. Section V displays the results for each state of the business cycle and provides a subgroup analysis. Section VI considers a few extensions to our approach and Section VII concludes.

II. Literature Review

The contribution of this paper lies at the intersection of macroeconomics and labor economics. The first strand of literature is concerned with the prevalence of segregated labor markets across gender, race, ethnicity and gender, and the consequences of such segregation for labor market outcomes. Burbridge (1994) has argued that the rapid expansion of healthcare, education and the social service industries, especially between 1950 and 1970, has led to a rise in occupational segregation by gender. However, such segregation has led to a wage penalty that is associated with female-intensive occupations (England, 1982; Goldin, 2014). Moreover, some have shown, using the index of occupational dissimilarity, that between 1940 and 1980, Black men and women were underrepresented in prestigious high paid occupations, despite the tremendous progress made since 1940 (Cunningham and Zalokar, 1992). In particular, the period 1950 to 1990 saw a dramatic rise in the proportion of employed Blacks, and in particular Black women, working in the public sector, relative to their White counterparts (Burbridge, 1994; 1994a). As was the case with gender, such occupational segregation by race was associated with labor market penalties. Indeed, related studies have demonstrated that a substantial portion of the racial wage gap can be attributed to occupational segregation, 65% of which cannot be explained by racial differences in human capital or other observable characteristics (Gill, 1994; Anderson and Shapiro, 1996).

Most studies on segregated labor markets and their consequences do not provide a framework to model labor market outcomes at various stages of the business cycle. One exception is Blanchard and Diamond (1990), who find that as an economy recovers from recession and businesses rehire, they select individuals who have the strongest labor market attachment. Motivated by different cyclical trends across age and sex groups, their model categorizes workers into primary and secondary workers, where the latter are perceived to have lower attachment, either due to high turnover or inadequate search during periods of low activity. Related empirical studies were then conducted to investigate how business cycle fluctuations shape the labor market outcomes of minorities. For example, Borjas (2006) finds that the wage rates of racial/ethnic minority groups, especially men, are relatively more sensitive to business cycle fluctuations. Likewise, Couch and Fairlie (2010) show that Black men are more likely to experience immediate job loss as economic activity declines, which is consistent with the increase in the racial unemployment gap that occurs during recessions (Cajner et al., 2017). Other studies show that women experience longer periods of unemployment duration, although there are signs that women’s employment outcomes are converging with those for men (Abraham and Shimer, 2001). However, none of these studies examined the distributional effects of deploying particular fiscal policy instruments, the use of which is likely to vary within and across business cycles, on the employment outcomes of various minority groups.

Recently, a number of studies have investigated the effects of fiscal policy (Cloyne and Surico, 2017; Anderson, Inoue and Rossi, 2016) and using micro-level data, have provided evidence that economic agents react differently to fiscal shocks, based on their income and borrowing constraints. Moreover, Cloyne and Surico (2017) showed that in the U.K, households with mortgage debt exhibit

large and significant consumption responses to tax changes. As it is a known fact that, in the U.S, home ownership rates are lowest for ethnic minorities, it is reasonable to expect that, at least with respect to consumption, minorities would be less sensitive towards fiscal policy shocks. While this nascent literature is informative for investigating consumption and income effects, its primary concern is with testing the validity of well-known macroeconomic theories, e.g. Keynesian models and intertemporal models based on representative agents, and it is thus, relatively silent on the relationship between fiscal policy instruments and employment outcomes. Using tax return data, Zidar (2019) finds that the positive relationship between tax cuts and employment growth can be primarily explained by tax cuts for low-income groups.

In this paper, we aim provide a framework to identify the possible mechanisms underlying variations in the responses of particular labor market segments to exogenous changes in fiscal policy. Combining the empirical literature on testing macroeconomic theories with the literature on segregated labor markets does however suggest that minority groups—based on race, ethnicity and gender—are overrepresented in industries and occupations that are affected in different ways when fiscal policy instruments are deployed.

This paper also relates to two major strands of the fiscal policy literature, most of which is generally analyzed through the use of vector autoregressive (VAR) models. The main issue within this framework is the identification of fiscal shocks, or fiscal policy innovations. Two strands of literature have emerged in terms of the identification problem. The first group produces fiscal shocks endogenously by identifying them by recursive orderings or restrictions on the model's dynamics (Blanchard and Perotti, 2002; Ravn and Simonelli, 2007; Monacelli, Perotti and Trigari, 2010). Meanwhile, in the second group, spending shocks are determined

exogenously using direct observations acquired through the narrative approach (e.g. Ramey and Shapiro, 1998; Mertens and Ravn, 2012; Romer and Romer, 2009).

The first approach is criticized on the grounds that if the fiscal shocks identified are in fact anticipated by economic agents prior to implementation, then the impulse responses thereby obtained will be biased. The narrative approach, which handles the aforementioned fiscal foresight critique, has increasingly become a welcome alternative. With this approach, exogenous fiscal shocks are identified by a narrative-based dummy, where Ramey and Shapiro (1998) construct a defense news measure using media outlets and Romer and Romer (2010) use information from presidential speeches and Congressional reports to identify and quantify exogenous tax changes³.

Studies using the VAR approach have demonstrated that a positive government spending shock decreases overall unemployment in the United States, and that the maximum impact takes approximately two years to occur. Monacelli, Perotti and Trigari (2010) have documented that the unemployment multiplier ranges between -0.4 and -0.6 at its peak (in year 2) for the U.S. More recently, Kato and Miyamoto (2013) and Pappa, Sajedi and Vella (2015) have confirmed the favorable effects of fiscal expansions on unemployment for Japan and 26 European countries, respectively, also by using the VAR approach. While some progress has been made in identifying the unemployment effects of changes in fiscal policy, most studies have focused on the effects on hours worked, consumption, and real wages (Bates, Jackson and Johnson, 2007; Galí, Lòpez-Salido and Vallés, 2007; Perotti, Reis and Ramey, 2007; Mountford and Uhlig, 2009). In line with the

³Specifically, Ramey and Shapiro (1998) utilize large exogenous increases in defense spending, such as the Vietnam War, the Korean War, and the Carter-Reagan military build-up, to identify shocks to fiscal policy.

Keynesian model, they find that a positive spending shock leads to a rise in all three outcomes.

Studies using the narrative approach usually analyze the effects of a positive shock in defense spending, (vs overall government spending), on macroeconomic outcomes and, although they find a positive effect on hours worked, their results reveal a negative effect on consumption and real wages (Ramey and Shapiro, 1998; Yuan and Li, 2000; Burnside, Eichenbaum and Fisher, 2004; Mertens and Ravn, 2012). These results have been explained by intertemporal models where households expect a tax hike following a positive spending shock to satisfy the government's intertemporal budget constraint. Through this negative wealth effect, households make optimal decisions by reducing consumption and by raising hours worked, thereby reducing real wages. Similarly, Romer and Romer (2010) find contractionary output effects in response to exogenous tax increases and identify the most sizeable decline in the investment component of GDP.

III. Data

A. *Micro Data (CPS)*

The micro-level data used in this paper combines all monthly household-level CPS data from 1976-2012, and uses the unique identifier to form a panel dataset at the individual level. In order to take full advantage of the longitudinal design of the data, only the years 1976-2012 are studied in the micro analysis, although our period of interest starts in 1973 after several variables on race and ethnicity were available⁴. The CPS is a monthly survey with a rotation design that visits households for four consecutive months and after an eight month hiatus

⁴That said, inclusion of 1973-1975, using only annual (ACES) data, does not alter the qualitative nature of the results.

revisits the same households for four more consecutive months. Approximately 50,000 households are sampled every month on detailed demographic and social characteristics as well as labor force and employment outcomes. Our full sample includes about 39 million individual observations in the age range of 18-64 that were interviewed during the period 1976-2012⁵.

The coding of some variables was changed over time in order to provide researchers with more information about the survey sample, and thus most variables over this long period were not consistent. To ensure uniformity across years, we recode these variables in accordance with a broader definition of responses. For example, the coding of marital status changed in 1989 to include the additional status of “separated”, but also to distinguish between divorced and widowed individuals, who were previously in the same category. In our paper, we use the coding prior to 1989 for marital status in order to achieve uniformity across years, and this procedure is followed with respect to other variables whose codes changed over time, such as educational attainment, race, and ethnicity.

To determine whether a year is included during a recessionary or expansionary period, we first estimate the (weighted) average national unemployment rate according to the CPS data by year. Recessionary periods are defined as those where the unemployment rate is rising, as in the years 1980-83, 1990-92, 2000-2003, and 2008-2010, covering over one third of all observations—14.87 million total and 11.46 million in the labor force—in the full sample. On the other hand, when the unemployment rate is falling, as in 1976-1979, 1984-1989, 1993-99, 2004-2006, and 2011-12, these periods are considered expansionary periods, where there are over 25 million observations in the full sample and 19 million in the labor force. This

⁵If we assume the average household over the period of interest has 1.8 working-age adults between the ages of 18 and 64, and given that fewer households were sampled in recent years, an average of 48,000 households were sampled monthly, then we have a total of 48,000 households*1.8 individuals/household*12 months*31 years=32 million individuals.

categorization is relevant as one of the primary questions of interest is to infer whether fiscal policy shocks vary at different states of the business cycle. This way of categorizing recessions and expansions largely overlaps with the NBER peak to trough and trough to peak dates.

B. Macro Data

Our main (independent) variables of interest include exogenous measures of changes in defense spending and changes in tax policy. The government spending measure, (D_t) is the real present discounted value of expected change in defense spending used in Ramey (2016), which covers all years from 1889 to 2015. Tax policy innovations, from 1976 to 2007, are identified through the change in real exogenous tax liabilities (T_t) as is estimated in (Romer and Romer, 2009, 2010). To cover recent changes in tax policy, during the period 2008-2011, we examine the Economic Report of the President (ERP) for each year between 2009 and 2012, which provides detailed information on the motivation underlying all acts of tax legislation in the previous year.

We argue that all tax legislation that occurred between 2008 and 2011 fell into at least one of two categories: either, the legislation was created to dampen the effect of the 2007-2008 Financial Crisis, or it was simply an extension of a previous tax policy (see Appendix A for more details). In the former case, it is clear that such tax legislation cannot be considered exogenous to output or employment since the intention of policymakers was to produce a countercyclical response to dire economic conditions. Furthermore, following Romer and Romer (2009), allowing extensions of tax policies, unlike that of tax expirations, is not considered a tax policy innovation. Thus, none of the changes in tax liabilities collected between 2008 and 2011 are considered exogenous tax changes, which

means that for these years $T_t = 0$. In fact, we believe that the tax cuts of 2018 represent the first exogenous tax change after 2007. However, since the language in the Economic Reports of the President has become more ambiguous in recent years, we choose to conduct our main analyses using tax measures only until 2011.

For all empirical specifications, we employ both fiscal variables in order to control for the budget equation, since failing to do so results in biased estimates of the parameters of interest (Kneller, Bleaney and Gemmell, 1999). Additionally, monetary policy shocks are identified through the federal funds rate (M_t), since it has been the primary target policy variable for the Federal Reserve since 1982. We should also note that inclusion of these variables are mostly consistent with Barro and Redlick (2011), with the exception that they use the squared government bond spread as an indicator of monetary credit conditions. It is worth noting that replacing the FFR with the squared government bond spread does not alter our results⁶.

C. Descriptive Statistics

Our macroeconomic dataset covers the period 1976:I–2012:IV, for a total of 148 observations. We should also note that our sample includes three wars during which defense spending increased considerably: the Cold War and the first and second Gulf Wars. Our data sample also includes large exogenous tax changes such as the largest tax cut since World War II, Reagan’s Economic Recovery Tax Act of 1981, and Bush’s Economic Growth Tax Relief Reconciliation Act of 2001; examples of deficit reduction tax increases in our analysis include Clinton’s Omnibus Budget Reconciliation Act of 1993, one of the most significant tax in-

⁶All this unemployment data is maintained in LABSTAT, the BLS public database on the Internet. They can be accessed at www.bls.gov/data/home.htm.

creases in recent history. Finally, our dataset allows the years following the Great Recession (2007-08) to be included in our analysis.

Figure 1 reports plots of the policy variables. A visual inspection would confirm that defense spending increased in the late 1970s (the Cold War), early in 1990 (Iraq War) and at the beginning of this century (2nd Iraq War). Tax rates show rather volatile behavior, primarily due to changes in political party orientation and other changes at the congressional and executive levels. To get a first sense of the relationship between fiscal policy shocks and macro-level unemployment rates, we estimate a 3-variable Vector Autoregressive (VAR) model. Each model comprises of the following variables: Unemployment Rate (U), Exogenous Government spending shocks (G) and exogenous changes in Tax liabilities (T). For the unemployment rates, we use various unemployment rates, all of which were obtained from the labor force statistics database of the Current Population Survey (CPS) provided by the Bureau of Labor Statistics (LBS). Our specifications include the unemployment rate (for people 16 years old and over), disaggregated by race (White, Black or African American, and Hispanic or Latino ethnicity).

The shocks to policy variables are identified from a Choleski decomposition of the variance-covariance matrix. In a choleski ordering, variables higher in the ordering are assumed to affect variables lower in the ordering contemporaneously, whereas variables lower in the ordering can only affect variables higher in the ordering only with a lag. For this particular exercise, we have tried two Choleski orderings: U, G, T and T, G, U. For both orderings the results were essentially the same. Below the empirical results for the former ordering are presented. Following (Romer and Romer, 2009, 2010) a lag length of 12 was chosen for all variables in the VAR. One standard deviation confidence intervals are obtained from 10,000 Monte Carlo draws. For space constraints, only the impulse response functions

(IRFs) to a one-standard deviation tax or defense spending policy shock were reported. The recessionary periods are controlled for with an exogenous dummy variable.

Figures 2 and 3 report the impulse response function of total unemployment to a one standard deviation shock to taxes or defense spending. The response of unemployment is insignificant for the first 7 quarters, but there is a positive and significant response between 7th and 12th quarters. For defense spending, the effect is also positive and largest in magnitude after 7 quarters, but is statistically insignificant throughout all quarters. To explore differences across race and ethnicity, Figures 4 and 5 reports the IRF of unemployment by race/ethnic subgroup to a one-standard deviation shock to taxes and defense spending: there is a statistically significant, and positive response to a tax shock between 7th and 11th quarters for Hispanic and non-Hispanic Whites, though the magnitude of the response varies across quarters and is consistently greater for Hispanic Whites. Both the magnitude and the significance of the response diminish for Blacks. These results suggest that the employment outcomes of Blacks are not as affected by tax policy innovations as can be predicted by the national average, while Hispanic Whites' employment outcomes are more likely to be shaped by exogenous tax changes. The main analysis will show that these results only hold under certain conditions.

For all groups, a one standard deviation in defense spending have a positive but statistically insignificant effect on unemployment (Figure 5). While these descriptive findings are useful, they can be misleading without further scrutinization since particular groups and model specifications alter the results. For example, defense spending shocks do have a strong and statistically significant effect on unemployment, but only consistently for non-Hispanic White males.

Finally, to provide descriptive evidence on whether the role of fiscal policy instruments varies, according to the state of the business cycle, we report coefficients of an OLS regression, where unemployment is regressed on 10 lags of each fiscal policy shock, separately for recessions and expansions. Figures 6 and 7 show that during recessionary periods only, increases in tax policy and defense spending have adverse employment shocks; the effect during expansionary periods is economically and statistically insignificant. In the remainder of the paper, our empirical analysis will first investigate the validity of these results and then scrutinize the hidden fabric by isolating its causes through the use of micro-level data.

IV. Empirical Strategy

The micro analysis allows for an extensive set of controls using a large sample size and, therefore, we use it as our baseline results. To analyze the effect of exogenous fiscal policy shocks on the likelihood of becoming unemployed between 1976 and 2012, we estimate a linear probability model:

$$\begin{aligned}
 I(Unemp)_{i,s,t} = & \sum_{j=0}^2 \beta_j D_{t-j} + \sum_{j=0}^2 \theta_j T_{t-j} + \sum_{j=0}^2 \lambda_j M_{t-j} + \\
 & \zeta I(MS)_{i,s,t} + \sum_{j=0}^2 \beta'_j D_{t-j} I(MS)_{i,s,t} + \sum_{j=0}^2 \theta'_j T_{t-j} I(MS)_{i,s,t} + \\
 & \sum_{j=0}^2 \lambda'_j M_{t-j} I(MS)_{i,s,t} + \delta X_{i,s,t} + \varepsilon_{i,s,t} \quad (1)
 \end{aligned}$$

where the dependent variable is a dummy variable that takes the value 1 if an individual i is unemployed in state s during time t and 0 otherwise; j represents the number of years that the variables of interest are lagged. The dependent

variable is regressed on the two following variables of interest: the expected change in defense spending (D_t) from Ramey (2015) and the change in exogenous tax liabilities (T_t) from Romer and Romer, 2010. The federal funds rate (M_t) is included as a proxy for monetary policy shocks.

Since a major contribution of this paper is to examine the differential effects of fiscal and monetary shocks on minority groups' labor market outcomes, two dummy variables are included to control for race (Black/White) and ethnicity (Hispanic/Non-Hispanic), where non-Hispanic Whites are the reference group. For brevity, MS in equation (1) represents the minority status–racial and ethnic–of an individual and, thus, the indicator variable $I(MS)_{i,s,t}$ consists of both dummy variables. Interaction terms between race, ethnicity and changes in fiscal policy are included to capture whether different subgroups of the population are uniformly affected by changes in policy. In addition to their current value, fiscal policy variables and the federal funds rate are also lagged two years and are interacted with race and ethnicity. Following the descriptive analysis above, all regressions are estimated separately during recessions and expansions.

While the variables of interest are exogenous, endogeneity concerns remain. For one, individuals who face limited options in the labor market, i.e. low-skilled, members of minority groups, and young people, may be underrepresented in the labor force during quarters where major changes in federal policy actually took place. In addition to race and ethnicity, we control for six educational attainment dummies, a fourth polynomial in age, marital status, and whether or not the individual was unemployed during the last visit ($X_{i,s,t}$). A second issue is that there is a great deal of variation across states with respect to tax policies and defense spending, some of which will coincide with changes in federal policies but other changes in state policies may be a direct response to it. For example, if the

federal government increases federal taxes and some states respond by reducing state taxes in order to appease the public, the effect of changes in federal tax policy on employment outcomes may be muted in those states. Thus, to the extent that state policies offset or complement federal ones, the parameters of interest are biased downward or upward respectively. Similarly, changes in power dynamics concerning political parties and policymakers across states may alter how some states react to federal policies over time.

Accordingly, changes in employment outcomes that cannot be accounted for by individual characteristics or changes in federal policies are included in the error term and can be decomposed into the following:

$$\varepsilon_{i,s,t} = \mu_s + \tau + \sigma_{st} + \tilde{\alpha}_{it} \quad (2)$$

where μ_s represents the inclusion of state fixed effects, τ is a yearly time trend, and σ_{st} is the interaction of state-time trend effects. In the first specification of the linear probability model, the parameters are unbiased as long as idiosyncratic changes across individuals ($\tilde{\alpha}_{it}$), beyond those included in $X_{i,s,t}$, are uncorrelated with changes in federal policies. In our second specification, a slight variant of this model is introduced so that the error term is split in the following way:

$$\varepsilon_{i,s,t} = \mu_s + \tau + \sigma_{st} + \tilde{\alpha}'_{it} + \alpha_i \quad (3)$$

In other words, in this specification, time-invariant individual fixed effects (α_i) are incorporated to account for time-invariant observable and unobservable characteristics. This allows us to capture the effect of changes in federal policies on employment outcomes within individuals. To the extent that time-variant individual traits ($\tilde{\alpha}'_{it}$) are uncorrelated with changes in federal policies—a fair assumption

given the short time span of the panel data—the parameters of the second specification are unbiased. One caveat, however, is that the error term must also be uncorrelated with controls other than the variables of interest, which may be problematic since time-invariant fixed effects are likely to be correlated with lagged unemployment. To address this issue, we also report the parameter estimates of a logit model with fixed effects, which are identified even in the presence of a correlation between fixed effects and other controls. Overall, the results are quite similar.

V. Empirical Analysis

A. Recessions

Table 2 displays the baseline results for equation (1) during recessionary periods, where the first column includes the full sample of labor force participants. Controls include a gender dummy, a dummy for Hispanic, a dummy for Black (non-Hispanic Whites are the reference group), a fourth polynomial in age, a dummy for being married, and six educational attainment dummy variables. Additionally, state fixed effects are included to control for state-level military spending and tax policies. A time trend and state-year trend effects are used to account for changes in these policies over time; standard errors are clustered at the state level. For all tables in the analysis, the point estimates are multiplied by 100 for ease of interpretation. The point estimates suggest that a 1% exogenous increase in tax liabilities, two years prior to a recession, raises the likelihood of being unemployed by approximately 1.1 percentage points two years later for the reference group, non-Hispanic Whites. The point estimates of the interaction terms show that Blacks' employment outcomes are not shaped by changes in taxes while those of Hispanics are the most affected. Moreover, the p-value associated with

the effect of taxes for Blacks is 0.53 while the corresponding value for Hispanics is 0.00. In contrast, Hispanics' employment prospects are the least likely to be influenced by defense spending. Col (1) shows that a \$1000 increase in the present discounted value of defense spending raises the unemployment rate by 1.5 ppts for non-Hispanic Whites, 1.3 ppts for Blacks and a statistically insignificant 0.7 ppts for Hispanics. To ensure that these results are not biased by different groups' recent employment status, a dummy variable for whether or not one was unemployed approximately a year ago is included in col (2); the results are qualitatively similar⁷.

In the remainder of our analysis, the sample is limited to labor force participants whose employment status has changed over the survey period in order to compare models with and without individual fixed effects, and examine which factors contribute the most to changes in employment outcomes. Using a linear probability model without individual fixed effects, we continue to find that tax hikes have adverse employment effects during recessionary periods and that this effect is not significant for Blacks but large for Hispanics. However, with respect to defense spending, the likelihood of unemployment for both Blacks and Hispanics are unaltered by changes in defense spending. Note that since the sample is limited to those who have changed their employment status during the 16 quarters they were interviewed, the point estimates are inflated relative to those in columns (1) and (2). With the inclusion of individual fixed effects in col (4) and (5), changes in the tax structure have a statistically and economically significant effect on all groups but Blacks (Hispanics) continue to be the least (most) vulnerable to such shocks. In contrast to tax policies, defense shocks have almost

⁷The only exception is that the employment status of Hispanics is much more susceptible to changes in tax policy when the lagged unemployment status is included. This is due to the fact that Hispanics have the lowest unemployment rates and have the lowest likelihood of being unemployed one year ago, which downward biases the results in column (1).

no effect on the employment outcomes of minority groups. Our main result here is consistent with studies that show that increases in defense spending, as opposed to government spending in general, may have adverse effects on economic growth (Ramey, 2011; Fishback, 2006; Giavazzi and Pagano, 1990; Abell, 1990; Hall, 1986). However, some studies have shown that when the data is limited to recessionary periods or periods of high levels of unemployment, the impact of defense spending on consumption is positive (Auerbach and Gorodnichenko, 2012; Giavazzi and McMahon, 2012), but there is no effect on the probability of employment (Giavazzi and McMahon, 2012).

Since fixed effects specifications are identified by those who switch between the two employment outcomes, the point estimates represent the likelihood of a switch in employment status after a change in fiscal policy. One concern with fixed effects specifications is the exclusion of those who remained employed or unemployed throughout the period in which the survey was taken. If these individuals are substantively different from those who did switch their employment status, the parameters of the fixed effects specification are biased. We revisit this issue later.

B. Expansions

We repeat the exercise during expansionary periods to assess the validity of the descriptive statistics where tax hikes and increases in military spending have adverse effects during recessionary periods but little to no effect during expansionary periods. As shown in Table 3, the effect of an increase in taxes results in a decline in the unemployment rate after two years, but the impact is smaller for Blacks and Hispanics. With the inclusion of fixed effects, the employment outcomes of ethnic and racial minority groups are even less responsive to changes in tax policy. Upon further investigation, we find that when splitting the data

on expansions into two periods before and after 1990, as in columns (4) and (5), tax hikes were unfavorable during the post-1990 period, while being advantageous prior to 1990. This result may be explained through the expansion of the EITC, which provided work incentives for low-income families, especially single mothers and female-headed households by reforming welfare to favor those who are employed (Hoynes, 2014). Nevertheless, in all specifications, minority groups are less affected by tax policy changes relative to non-Hispanic whites.

Meanwhile, increases in defense spending continue to have adverse employment effects that are of similar magnitude as previously discussed, but with the presence of individual fixed effects, the effect of defense spending increases dramatically. As noted before, this is in line with the previous literature. One notable difference with respect to the business cycle is that during recessions, the impact of defense spending is more economically significant one year after the policy is implemented, while during expansions, the impact is mainly realized after two years. Recessionary periods may be more reactive to changes in defense spending since the economy is not operating at its full potential. Furthermore, unlike recessions, during expansions, the inclusion of individual fixed effects leads to more uniformity across racial and ethnic groups.

Overall, the results suggest that increases in defense spending (two years later) are likely to lead to increases in the unemployment rate for all groups during expansions and for non-Hispanic whites during recessions; these results are robust to various model specifications. This is inconsistent with findings that show that an increase in defense spending harms Blacks more than Whites (Abell, 1990). One explanation for this inconsistency may be that the time period used in Abell (1990) only covers the 1980's, a period of high-tech weaponry investment during the Cold War; additionally, changes in the business cycle are not accounted for in

Abell's paper. When we disaggregate the sample into two periods, pre-1990 and post-1990, we find some evidence in support of the hypothesis that increases in defense spending led to detrimental consequences for the job prospects of Blacks during the pre-1990 period. However, the standard errors are too large to produce a p-value that is low enough to reject the null hypothesis that increases in the defense spending had no effect on the employment status for Black labor force participants.

An increase in defense spending two years later has adverse employment effects during recessionary periods and expansions during the post-1990 period. Minority groups are generally less affected, although to varying degrees, depending on the specification and the stage of the business cycle. On the other hand, an increase in tax liabilities raises the likelihood of unemployment during recessions but decreases its likelihood during expansions. Relative to non-Hispanic Whites, Blacks are consistently less affected by changes in tax policy, while Hispanics are the most susceptible during recessions and much less affected during expansions. To examine these trends further, we now turn to the role of gender, industrial classification and occupational status.

C. Heterogeneity and Subgroup Analysis

Table 4 reports individual fixed effect estimates for regression (1) separately for each gender and the state of the business cycle, providing a first step to examine the mechanisms underlining the distributional effects of fiscal policy changes. The results show that during recessionary periods, the magnitude of the point estimates for changes in tax policy and defense spending are much larger for men than women. This implies that men's employment outcomes are much more susceptible to fiscal policy changes than women. Additionally, note that we no

longer observe the trends in Table 2, where Blacks (Hispanics) are less (more) likely to be affected by tax policy changes. Instead, male's employment outcomes seem to respond in a relatively uniform manner to tax changes during recessionary periods.

The trends related to tax policy changes observed for the full sample during recessionary period are in fact, completely driven by women, where Black women's employment outcomes are the least affected by tax changes while outcomes of Hispanic women are the most influenced. In contrast, the finding that changes in defense spending shape the employment outcomes of non-Hispanic Whites but not those of ethnic/racial minority groups is primarily driven by men; in fact, military spending changes have no effect on female employment outcomes. In the case for expansionary periods, columns (3) and (4) suggest that prior results reported in relation to changes in tax policy are driven by men's employment outcomes, where non-Hispanic whites are the most affected, followed by Hispanic Whites, and where the effect of tax policy changes on Black's employment outcomes is not significantly different from zero. Finally, the employment outcomes of all six groups (gender*racial/ethnic group) are both highly and evenly responsive to changes in defense spending.

At this point, we aim to investigate the variation in responses to fiscal policy instruments across the six groups. For example, why do women drive the results for tax changes during recessions while men drive the results for changes in defense spending? We will use changes in sector, industry affiliation and occupation status across gender, racial and ethnic lines to understand how different groups are favored by fiscal policy changes. Table 5 reports the results for a linear probability model (LPM) during recessionary periods, first without job-related controls, then by sectoral and industry affiliation in their most recent job, and

finally by occupational status in their most recent job; as before, the sample is limited to those whose employment status has changed during the sixteen quarters interviewed, and the regressions are run separately by gender. The coefficients for each industry and occupation control are reported in Appendix Tables 1 and 2.

A comparison of columns (1)-(3) shows that when sector and industry controls are included, a tax hike has an adverse effect during recessions on all groups of women two years later, but there is no effect on any group when occupation controls are included. The result in column (1) (as well as that in Tables 2 and 4) that Black (Hispanic) women are the least (most) responsive to changes in tax policy does not hold anymore. This is because Black women are more likely to be employed in the public sector (see Table 1) as well as industries that are the least responsive to changes in tax policy, such as Public Administration and Education/Health (see Appendix Table 1). Similarly, Hispanic women are less likely to work in such industries and even with respect to occupational status, they are overrepresented in occupations that are sensitive to tax changes such as Sales & Services and Elementary occupations (see Appendix Table 2).

For men, tax changes had a relatively uniform effect on changes in employment outcomes across groups during recessions. The effect was even more uniform when industry and sector were controlled for, possibly due to a combination of trends that partly offset each each other. For example, Black men are overrepresented in Education and Health, and Public Administration (and the public sector in general), but are underrepresented as self-employed; meanwhile, these three job types are among the leastly likely to be affected by tax changes. However, when occupational status is included in the regressions, tax changes have no effect on the employment outcomes of any group. Specifically, the results are driven by

men in elementary occupations, whose employment status are most vulnerable to policy changes. This is especially problematic given that nearly 40% of minority men and 28.6% of non-Hispanic White men held jobs in elementary occupations during the sample period.

Col(1) and (4) show that non-Hispanic white men and women are the most susceptible to changes in defense spending. For women, the results can be attributed to the high porportion of self-employed workers, a group that has a high propensity to vary employment outcomes with changes in defense spending. Meanwhile, it seems that industry affiliation and occupational status play little to no role in explaining the differences observed among groups. For men, the results are primarily driven by the manufacturing industry, which is simultaneously overrepresented by non-Hispanic Whites (followed by Blacks) and is the most responsive to military spending, as expected. As before, elementary occupation male workers are the most susceptible to becoming unemployed as defense spending increases during a recession. We now turn to Table 6 for a brief discussion on how fiscal policies inadvertently favored various groups during expansionary periods.

During expansionary periods, all six groups experienced favorable outcomes in the event of a tax hike. However, in the presence of occupational controls, the effect of a change in tax on the likelihood of being unemployed was no longer statistically significant for Hispanic women. This is likely the result of their under(over)-representation as academic professionals (elementary occupation workers). For men, the point estimates and corresponding p-values suggest that the effect of tax changes is relatively uniform for all specifications, and the influence of tax changes varies across occupations. Unlike tax hikes, increases in defense spending led to a rise in the unemployment rate of non-Hispanic white men, but no other group. Moreover, when controls for sector and industry affilia-

tion are included, we find that Black and Hispanic men are affected by changes in defense spending, while there is no statistically significant effect on non-Hispanic white men; these conclusions are consistent with previous findings (Abell, 1991, 1990). However, upon close examination, the effect of defense spending has a strong effect primarily on clerical and crafts/trades related male workers during expansions. Otherwise the effect is not statistically different from zero for any subgroup. The analysis for women implies that defense spending has no effect on the employment outcomes of any group of women, with or without controls, during expansionary periods.

In the 1980s industry shifts were large and significant where public sector jobs and the service industry (financial, real estate, business, legal, health, and education) experienced tremendous growth (Plunkert, 1990), all the while Hispanics were highly concentrated in either moderately growing industries (construction, hospitality, and transportation) or declining industries (agriculture).

Our contrasting findings for recessions and expansions allow us to confirm that, indeed, fiscal policy shocks not only have varying effects on employment outcomes depending on the stage of the business cycle in question but also have contrasting effects on racial/ethnic subgroups at different points and episodes of the business cycle.

VI. Discussion & Extensions

We examine whether our main results can be extended to other dimensions of employment and unemployment by investigating changes in labor force status as well as changes in contract type (full-time/part-time) during the survey period. First, we include non-participants to gain a more comprehensive understanding of how labor markets respond to fiscal shocks during recessions, where

workers are less likely to participate due to the discouraged worker effect. In fact, Shimer (2012) finds that during recessions, part of the transition from the status of employed to unemployed is offset by the transition from employment to non-participation.⁸ On a related note, there are some arguments that the composition of unemployed individuals varies across different states of the business cycle (Darby, Haltiwanger and Plant, 1986). Specifically, unemployed individuals during recessions may exhibit particular characteristics that impede their job finding prospects and therefore experience relatively long term unemployment.⁹ In Table 7, we measure the effect of fiscal policy shocks on the labor force participation rate. The sample is limited to individuals whose labor force status has changed during the 16 quarters surveyed, and the dependent variable is 1 for individuals who are out of the labor force and 0 for individuals who are employed or unemployed. Table 7 estimates a linear probability model with individual fixed effects by gender and the state of the business cycle.

The results show that on the one hand, women are more likely to participate in the labor force in the event of a tax increase during recessions. Hispanic women are the exception, possibly because their participation rates are sufficiently high, or their decision to participate is driven by other factors. On the other hand, tax hikes increase the likelihood of opting out of the labor force only for Non-Hispanic white males. Meanwhile, the labor force participation rates of Black and Hispanic men do not respond to changes in tax policy. These findings indicate that Hispanic women and minority men either have stronger labor market attachment than

⁸Many in the job search literature (Shimer, 2012; Elsby, Michaels and Solon, 2009; Hall, 2005) also find that the unemployment rate during recessions is driven by decreases in the job finding rate (the rate at which individuals move from the status of unemployed to the status of employed) rather than increases in the dismissal rate (the rate at which individuals from the status of employed to the status of unemployed).

⁹The reasoning behind the inclusion of non-participants is also justified on the grounds that the labor force participation rate is known to rise during expansions because individuals are encouraged to participate when the economy experiences a boom due to increased confidence in markets.

other groups, or their decision to participate relies on factors that are independent of the economy's state.

With respect to changes in defense spending, only Black women are responsive during recessions, where they are more likely to opt out as military spending increases. Likewise, and in contrast to changes in tax policy, minority men react to changes in defense spending but non-Hispanic Whites do not. It is worth noting that during recessions, increases in military spending lead to opposite trends (as was the case with tax changes during recessions) across genders, where Black women are more likely to opt out and minority men are more likely to participate in the labor force. This trend may be related to the types of jobs available during recessions as military spending increases.

During expansions, the results are much more uniform across gender. For example, defense spending increases participation rates for Blacks and non-Hispanic Whites of both genders, although the point estimates are larger for men. Likewise, tax hikes raise labor force participation rates for non-Hispanic whites of both genders. Although the rates of minority men remain unaffected by tax policy, Hispanic women are now affected by changes in tax policy while Black women are not.

Overall, it seems that the participation rates for non-Hispanic Whites are quite reactive to tax changes while Blacks are more responsive to changes in defense spending. It is possible that better data is needed to pin down the mechanisms behind these trends since differences in wealth and income, wages of spouses, employment histories and household bargaining are likely to play a strong role in these results. In Table 8, we repeat the exercise above to investigate the likelihood of working part-time conditional on employment. The sample is limited to employed individuals who changed their employment contract during recessions

or expansions. The main finding demonstrates that tax increases during recessionary periods are predicted to raise the probability of working part-time for all groups except Hispanic women, whose employment status is likely influenced by external factors.

VII. Conclusion

Our main results can be summarized as follows: first, we find that changes to tax policy have larger adverse effects than those of defense spending on unemployment. This result reinforces the study by Cloyne (2013) which argues that tax changes have powerful and persistent effects. Second, to address concerns about changes in the direction and magnitude of fiscal policy multipliers across different phases of the economy¹⁰, we first estimate the parameters of interest for both recessions and expansions using pooled data. We show that the negative effects of tax hikes are completely driven by recessionary periods. In fact, when the economy is expanding, the parameters take the opposite sign in most specifications, suggesting that a rise in taxes are either neutral or even favorable during expansionary periods.

During recessions, we show that the unemployment effect, approximately two years, after a 1% increase in taxes, is in the range of 0-2.6 percentage points during recessionary periods, depending on the racial/ethnic subgroup. Given the results in Romer and Romer (2009) that a 1% increase in taxes reduces output by about 3%, our estimates are fairly consistent with Okun's law. Third, there is substantial heterogeneity in the magnitude and statistical significance of the effects of deploying fiscal policy instruments across subgroups. Relative to non-

¹⁰It is well documented in the literature that fiscal policy multipliers increase during recessions (Baum, Poplawski-Ribeiro and Weber, 2012; Auerbach and Gorodnichenko, 2012; Arin, Koray and Spagnolo, 2015).

Hispanic Whites, Blacks are consistently less affected by changes in tax policy, while Hispanics are the most susceptible during recessions and much less affected during expansions.

Fourth, an analysis of the composition of workers prior to entering the unemployment state reveals that gender plays a key role in driving the main results, and labor market segregation across race, ethnicity and gender drive most of the trends observed. For example, when the results are disaggregated by gender, we show that women drive the results that Blacks are the least affected by tax changes while Hispanic women are the most influenced. Moreover, we show that Black women are more likely to be employed in the public sector as well as industries that are the least responsive to changes in tax policy, while Hispanic women are less likely to work in such industries and are overrepresented in occupations that are sensitive to tax changes.

Fifth, as we aim to extend our analysis to measuring the impact of fiscal policy instruments on outcomes beyond employment and unemployment, we find that most groups are influenced by similar factors with respect to part-time employment but not the decision to participation in the labor force. In particular, men and women respond in opposite directions with respect to tax changes during recessionary periods, and the participation rates for non-Hispanic Whites are quite reactive to tax changes while Blacks are more responsive to changes in defense spending.

REFERENCES

- Abell, John D.** 1990. "Defense Spending and Unemployment Rates: An Empirical Analysis Disaggregated by Race." *Cambridge Journal of Economics*, 14(4): 405–419. I, V.A, V.B, V.C
- Abell, John D.** 1991. "Distributional Effects of Monetary and Fiscal Policy: Impacts on Unemployment Rates Disaggregated by Race and Gender." *American Journal of Economics and Sociology*, 50(3): 269–284. I, V.C
- Abraham, K.G., and R. Shimer.** 2001. "Changes in Unemployment Duration and Labor Force Attachment." *The Roaring Nineties: Can Full Employment be Sustained?*, 367–420. Russell Sage Foundation. II
- Anderson, D., and D. Shapiro.** 1996. "Racial differences in access to high-paying jobs and the wage gap between black and white women." *ILR Review*, 49(2): 273–286. II
- Anderson, Emily, Atsushi Inoue, and Barbara Rossi.** 2016. "Heterogeneous Consumers and Fiscal Policy Shocks." *Journal of Money, Credit and Banking*, 48(8): 1877–1888. II
- Arin, K Peren, Faik Koray, and Nicola Spagnolo.** 2015. "Fiscal Multipliers in Good Times and Bad Times." *Journal of Macroeconomics*, 44: 303–311. 10
- Auerbach, Alan J, and Yuriy Gorodnichenko.** 2012. "Measuring the Output Responses to Fiscal Policy." *American Economic Journal: Economic Policy*, 4(2): 1–27. V.A, 10
- Barro, Robert J, and Charles J Redlick.** 2011. "Macroeconomic Effects From Government Purchases and Taxes." *The Quarterly Journal of Economics*, 126(1): 51–102. III.B
- Bates, Timothy, William E Jackson, and James H Johnson.** 2007. "Introduction: Advancing Research on Minority Entrepreneurship." *The Annals of the American Academy of Political and Social Science*, 613: 10–17. II
- Baum, Anja, Marcos Poplawski-Ribeiro, and Anke Weber.** 2012. "Fiscal Multipliers and the State of the Economy." IMF Working Paper 12/286. 10
- Blanchard, O.J., and P. Diamond.** 1990. "The Cyclical Behavior of the Gross Flows of U.S. Workers." *Brookings Papers on Economic Activity*, 1990(2): 85–155. II
- Blanchard, Olivier, and Roberto Perotti.** 2002. "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output." *The Quarterly Journal of Economics*, 117(4): 1329–1368. II

- Borjas, G.** 2006. “Wage Trends Among Disadvantaged Minorities.” *Economic Challenges, Policy Changes, and Poverty*, 59–86. Russell Sage Foundation. II
- Burbridge, L.C.** 1994. “The reliance of African-American women on government and third-sector employment.” *American Economic Review*, 84(2): 103–107. II
- Burbridge, L.C.** 1994a. “The Occupational Structure of Non-profit Industries: Implications for Women.” *Women and power in the nonprofit sector*. Jossey-Bass. II
- Burnside, Craig, Martin Eichenbaum, and Jonas DM Fisher.** 2004. “Fiscal Shocks and Their Consequences.” *Journal of Economic theory*, 115(1): 89–117. II
- Cajner, Tomaz, Tyler Radler, David Ratner, and Ivan Vidangos.** 2017. “Racial Gaps in Labor Market Outcomes in the Last Four Decades and over the Business Cycle.” Board of Governors of the Federal Reserve System (U.S.) Finance and Economics Discussion Series. II
- Cloyne, James.** 2013. “Discretionary Tax Changes and the Macroeconomy: New Narrative Evidence From the United Kingdom.” *American Economic Review*, 103(4): 1507–1528. VII
- Cloyne, James, and Paolo Surico.** 2017. “Household Debt and the Dynamic Effects of Income Tax Changes.” *Review of Economic Studies*, 84(1): 45–81. II
- Couch, K.A., and R. Fairlie.** 2010. “Last hired, first fired? Black-white unemployment and the business cycle.” *Demography*, 47(1): 227–47. II
- Cunningham, J.S., and N. Zalokar.** 1992. “The economic progress of black women, 1940–1980: Occupational distribution and relative wages.” *ILR Review*, 45(3): 540–555. II
- Darby, Michael R, John C Haltiwanger, and Mark W Plant.** 1986. “The Ins and Outs of Unemployment: The Ins Win.” NBER Working Paper 1997. VI
- DeLong, Bradford J, and Lawrence Summers.** 2012. “Fiscal Policy in a Depressed Economy.” *Brookings Papers on Economic Activity*, 44(1 (Spring)): 233–297. I
- Elsby, Michael WL, Ryan Michaels, and Gary Solon.** 2009. “The Ins and Outs of Cyclical Unemployment.” *American Economic Journal: Macroeconomics*, 1(1): 84–110. 8
- England, P.** 1982. “The Failure of Human Capital Theory to Explain Occupational Sex Segregation.” *Journal of Human Resources*, 7(3): 358–370. II
- ERP.** 2009. “Economic Report of the President of 2009.” A

- ERP.** 2010. “Economic Report of the President of 2010.” A
- ERP.** 2011. “Economic Report of the President of 2011.” A
- ERP.** 2012. “Economic Report of the President of 2012.” A
- Fishback, Price V.** 2006. “The Irony of Reform. Did Large Employers Subvert Workplace Safety Reform, 1869 to 1930?” *Corruption and Reform: Lessons From America’s Economic History*, 285–318. University of Chicago Press. V.A
- Galí, Jordi, J David Lòpez-Salido, and Javier Vallés.** 2007. “Understanding the Effects of Government Spending on Consumption.” *Journal of the European Economic Association*, 5(1): 227–270. II
- Giavazzi, Francesco, and Marco Pagano.** 1990. “Can Severe Fiscal Contractions be Expansionary? Tales of Two Small European Countries.” *NBER Macroeconomics Annual*, 5: 75–111. V.A
- Giavazzi, Francesco, and Michael McMahon.** 2012. “The Household Effects of Government Spending.” In *Fiscal Policy after the Financial Crisis*. 103–141. University of Chicago Press. V.A
- Gill, A.** 1994. “Incorporating the Causes of Occupational Differences in Studies of Racial Wage Differentials.” *Journal of Human Resources*, 29(1(Winter)): 20–41. II
- Goldin, C.** 2014. “A pollution theory of discrimination: male and female differences in occupations and earnings.” NBER Working Paper 8985. II
- Hall, Robert E.** 1986. “The Role of Consumption in Economic Fluctuations.” In *The American Business Cycle: Continuity and Change*. 237–266. University of Chicago Press. V.A
- Hall, Robert E.** 2005. “Job Loss, Job Finding, and Unemployment in the US Economy Over the Past Fifty Years.” *NBER Macroeconomics Annual*, 20: 101–137. 8
- Hoynes, Hilary W.** 2014. “A Revolution in Poverty Policy: The Earned Income Tax Credit and the Well-Being of American Families.” *Pathways*, 23–27. V.B
- Kato, Ryuta Ray, and Hiroaki Miyamoto.** 2013. “Fiscal Stimulus and Labor Market Dynamics in Japan.” *Journal of the Japanese and International Economies*, 30: 33–58. II
- Kneller, Richard, Michael F Bleaney, and Norman Gemmell.** 1999. “Fiscal policy and growth: evidence from OECD countries.” *Journal of public economics*, 74(2): 171–190. III.B

- Mertens, Karel, and Morten O Ravn.** 2012. “Empirical Evidence on the Aggregate Effects of Anticipated and Unanticipated US Tax Policy Shocks.” *American Economic Journal: Economic Policy*, 4(2): 145–181. II
- Monacelli, Tommaso, Roberto Perotti, and Antonella Trigari.** 2010. “Unemployment Fiscal Multipliers.” *Journal of Monetary Economics*, 57(5): 531–553. II
- Mountford, Andrew, and Harald Uhlig.** 2009. “What are the Effects of Fiscal Policy Shocks?” *Journal of Applied Econometrics*, 24(6): 960–992. II
- Pappa, Evi, Rana Sajedi, and Eugenia Vella.** 2015. “Fiscal Consolidation With Tax Evasion and Corruption.” *Journal of International Economics*, 96: S56–S75. II
- Perotti, Roberto, Ricardo Reis, and Valerie Ramey.** 2007. “In Search of the Transmission Mechanism of Fiscal Policy [with Comments and Discussion].” *NBER Macroeconomics Annual*, 22: 169–249. II
- Plunkert, Lois M.** 1990. “The 1980’s: A Decade of Job Growth and Industry Shifts.” *Monthly Labor Review*, 113: 3. V.C
- Ramey, V.** 2016. “Defense News Shocks, 1889–2015: Estimates Based on News Sources.” Posted on the University of California, San Deigo Website. I, III.B
- Ramey, Valerie A.** 2011. “Identifying Government Spending Shocks: It’s all in the Timing.” *The Quarterly Journal of Economics*, 126(1): 1–50. V.A
- Ramey, Valerie A, and Matthew D Shapiro.** 1998. “Costly Capital Reallocation and the Effects of Government Spending.” In *Carnegie-Rochester Conference Series on Public Policy*. Vol. 48, 145–194. North-Holland. II, 3
- Ravn, Morten O, and Saverio Simonelli.** 2007. “Labor Market Dynamics and the Business Cycle: Structural Evidence for the United States.” *The Scandinavian Journal of Economics*, 109(4): 743–777. II
- Romer, Christina D, and David H Romer.** 2009. “A Narrative Analysis of PostWar Tax Changes, online appendix to “The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks”.” Posted on American Economic Review Website. I, II, III.B, III.C, VII
- Romer, Christina D, and David H Romer.** 2010. “The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks.” *The American Economic Review*, 100(3): 763–801. II, III.B, III.C
- Shapiro, Matthew D.** 2006. “Phased-in Tax Cuts and Economic Activity.” *The American Economic Review*, 96(5): 1835–1849. 1

- Shimer, Robert.** 2012. “Reassessing the Ins and Outs of Unemployment.” *Review of Economic Dynamics*, 15(2): 127–148. VI, 8
- Yuan, Mingwei, and Wenli Li.** 2000. “Dynamic Employment and Hours Effects of Government Spending Shocks.” *Journal of Economic Dynamics and Control*, 24(8): 1233–1263. II
- Zidar, Owen.** 2019. “Tax Cuts for Whom? Heterogeneous Effects of Income Tax Changes on Growth and Employment.” *Journal of Political Economy*, 127(3). II

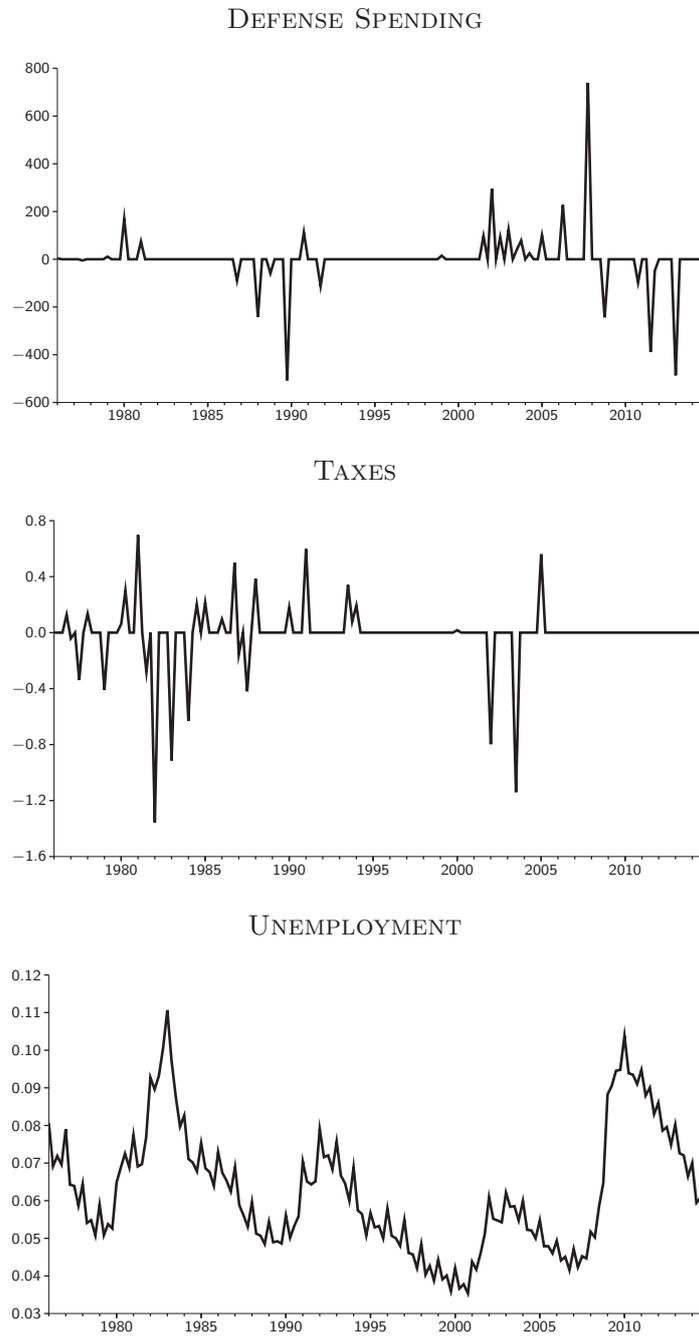


FIGURE 1. FISCAL POLICY INSTRUMENTS AND UNEMPLOYMENT (1976-2012)

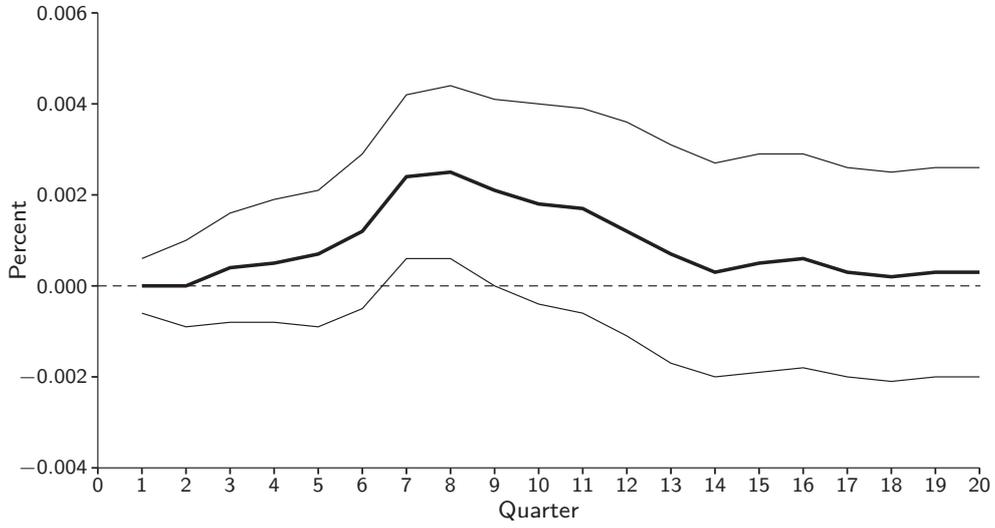


FIGURE 2. IMPULSE RESPONSE FUNCTION OF TOTAL UNEMPLOYMENT TO TAX SHOCKS (VAR)

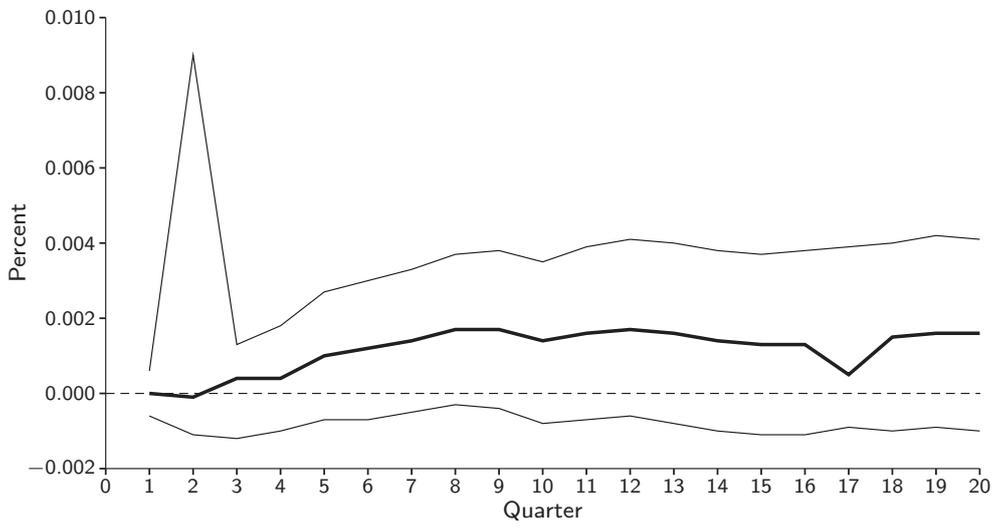


FIGURE 3. IMPULSE RESPONSE FUNCTION OF UNEMPLOYMENT TO DEFENSE SPENDING SHOCKS (VAR)

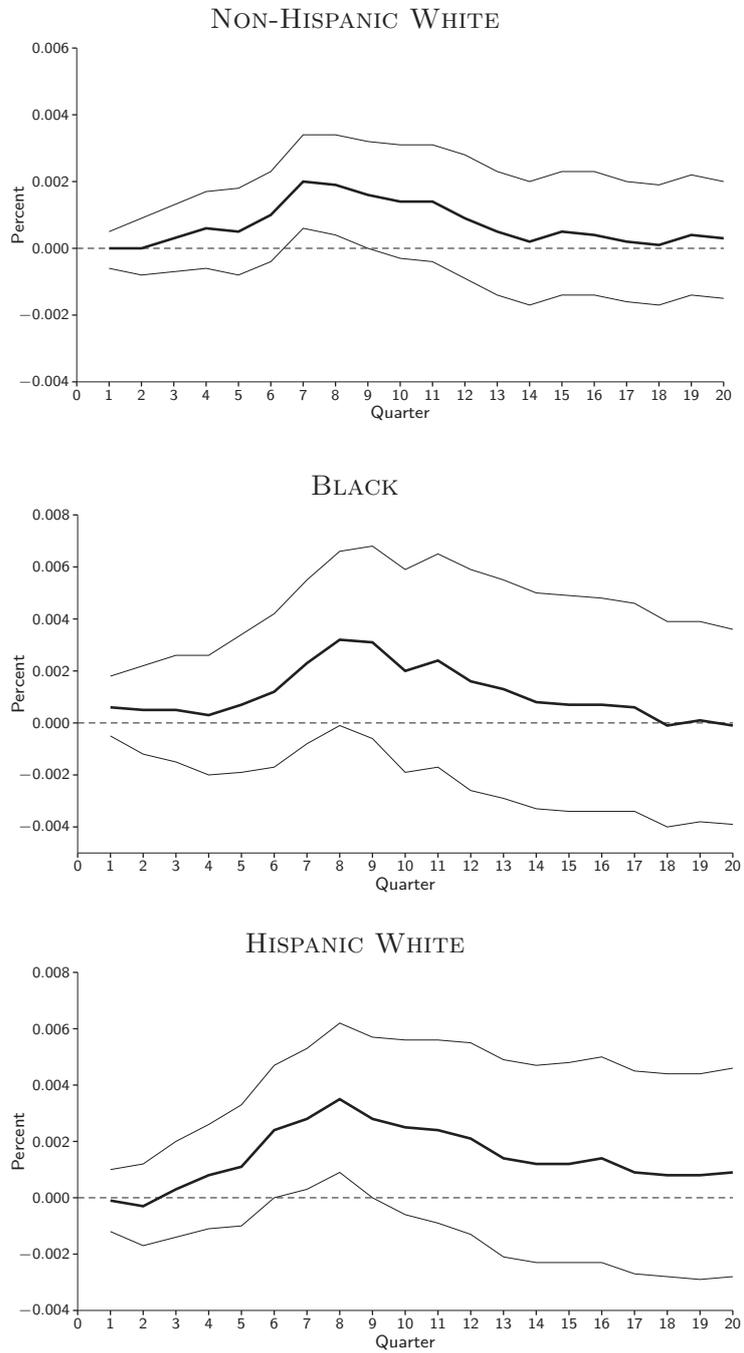


FIGURE 4. IMPULSE RESPONSE FUNCTIONS OF UNEMPLOYMENT TO TAX SHOCKS BY ETHNICITY (VAR)

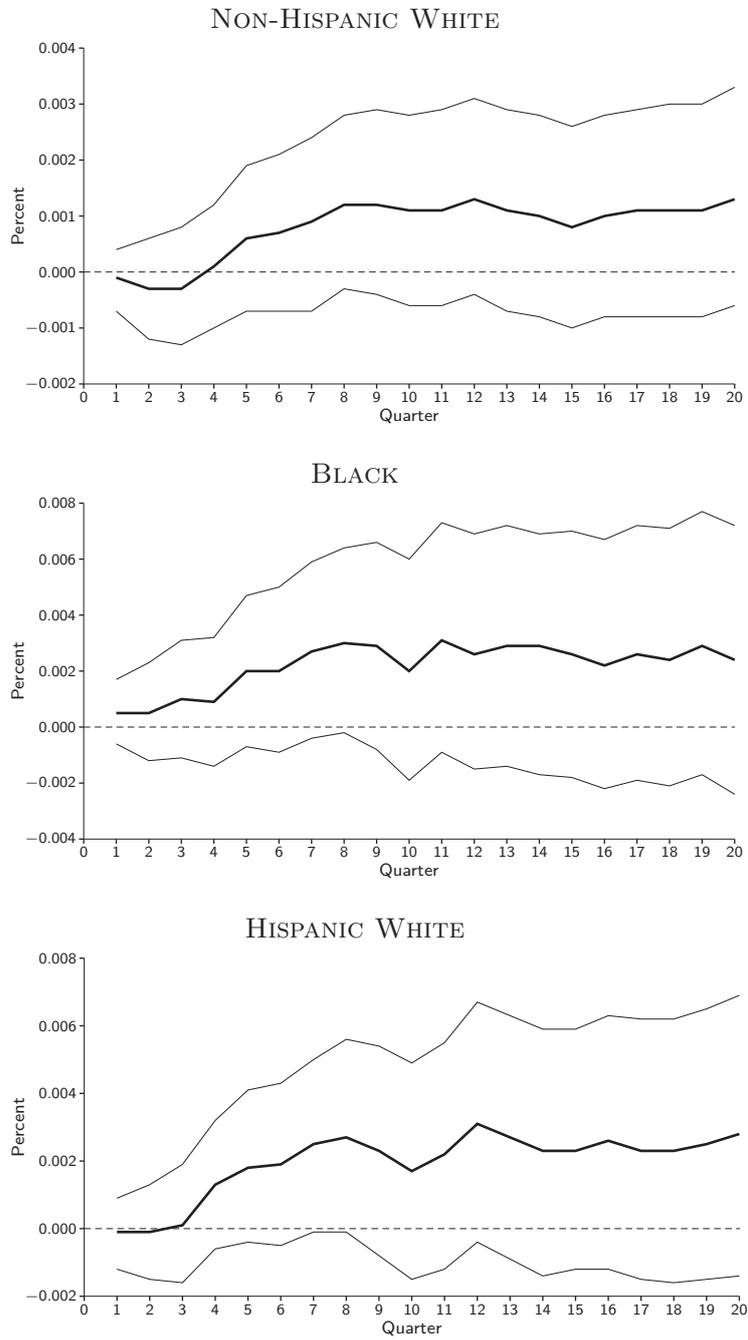


FIGURE 5. IMPULSE RESPONSE FUNCTIONS OF UNEMPLOYMENT TO SPENDING SHOCKS BY ETHNICITY (VAR)

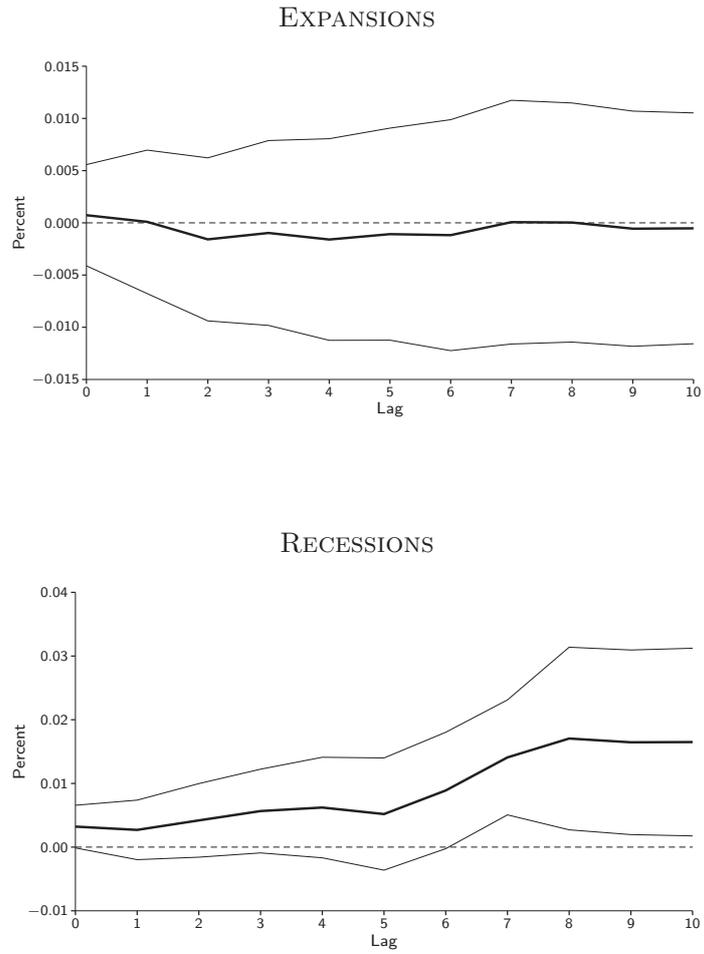


FIGURE 6. IRF OF UNEMPLOYMENT TO TAX SHOCKS BY STATE OF BUSINESS CYCLE (OLS)

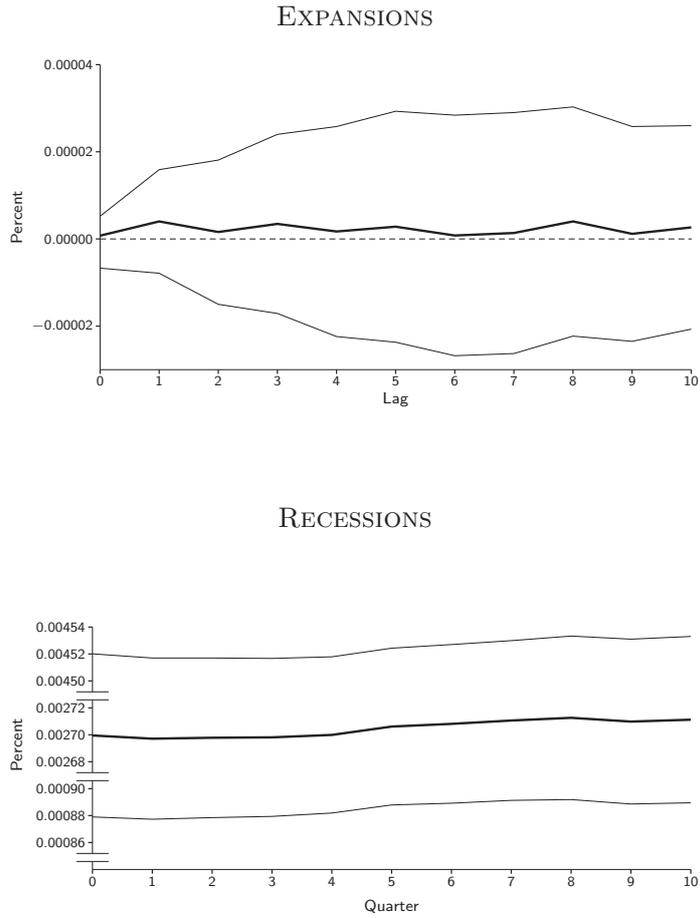


FIGURE 7. IRF OF UNEMPLOYMENT TO DEFENSE SPENDING SHOCKS BY STATE OF BUSINESS CYCLE (OLS)

TABLE 1—DESCRIPTIVE STATISTICS FOR WORKING INDIVIDUALS BY GENDER, RACE AND ETHNICITY (1976-2012)

	<i>Females</i>			<i>Males</i>		
	Hispanic	Black	Non-Hispanic	Hispanic	Black	Non-Hispanic
<i>Unemp Rate</i>	0.085	0.113	0.049	0.077	0.124	0.052
<i>Public Sector</i>	0.147	0.242	0.178	0.083	0.178	0.126
<i>Private Sector</i>	0.799	0.727	0.741	0.829	0.759	0.731
<i>Self-Employment</i>	0.054	0.031	0.081	0.088	0.063	0.143
<i>Agriculture</i>	0.018	0.003	0.013	0.056	0.019	0.031
<i>Mining</i>	0.003	0.001	0.002	0.011	0.004	0.012
<i>Construction</i>	0.011	0.006	0.016	0.165	0.088	0.121
<i>Manufacturing</i>	0.156	0.115	0.11	0.191	0.199	0.209
<i>Wholesale</i>	0.193	0.146	0.198	0.183	0.166	0.179
<i>Transportation</i>	0.025	0.035	0.026	0.067	0.112	0.074
<i>Information</i>	0.014	0.022	0.018	0.013	0.018	0.019
<i>Financial Activity</i>	0.068	0.068	0.087	0.035	0.042	0.054
<i>Professional/Bus</i>	0.074	0.065	0.072	0.073	0.075	0.076
<i>Education/Health</i>	0.247	0.349	0.305	0.059	0.115	0.089
<i>Hospitality</i>	0.072	0.049	0.045	0.06	0.048	0.034
<i>Other Services</i>	0.086	0.072	0.066	0.056	0.051	0.052
<i>Public Admin</i>	0.035	0.069	0.041	0.031	0.063	0.051
<i>Managers</i>	0.043	0.043	0.074	0.048	0.047	0.11
<i>Academics</i>	0.014	0.018	0.029	0.025	0.03	0.076
<i>Professionals</i>	0.115	0.151	0.207	0.048	0.072	0.104
<i>Associates/Tech</i>	0.073	0.118	0.089	0.035	0.045	0.066
<i>Clerical Workers</i>	0.229	0.237	0.269	0.059	0.089	0.056
<i>Sales & Service</i>	0.207	0.187	0.18	0.156	0.152	0.134
<i>Agriculture</i>	0.006	0.001	0.001	0.013	0.002	0.006
<i>Craft/Trades</i>	0.008	0.008	0.01	0.11	0.062	0.088
<i>Machine Operator</i>	0.062	0.045	0.029	0.105	0.112	0.073

Note: CPS pooled monthly data during 1976-2012; probability weights are used to compute averages for each group.

TABLE 2—THE IMPACT OF FISCAL POLICY INSTRUMENTS ON UNEMPLOYMENT
(RECESSIONARY PERIODS)

Labor Force Participants	Full Sample		Change in Employment Status			
	Y=1 if Unemployed (Recessions)	LPM (1)	LPM (2)	LPM (3)	LPM/FE (4)	CLFE (5)
Unemp (Lag 1 year)			29.31*** (0.61)			
Black	3.22*** (0.20)	1.55*** (0.21)	5.53*** (0.50)	7.59*** (1.35)	32.87*** (6.36)	
Hispanic	-0.52 (0.34)	-0.46* (0.27)	-2.76*** (0.84)	-0.11 (1.16)	-0.97 (5.54)	
Taxes (Lag 1 year)	-0.34*** (0.11)	-0.23** (0.11)	-0.51 (0.43)	1.61*** (0.26)	7.61*** (1.27)	
• Interact with Black	-1.12*** (0.28)	-0.74* (0.43)	-0.77 (0.82)	0.31 (0.67)	1.25 (3.36)	
• Interact with Hispanic	-0.44** (0.17)	-0.10 (0.23)	-1.34 (1.1)	-1.03 (0.78)	-5.33 (3.8)	
Taxes (Lag 2 years)	1.09*** (0.15)	0.72*** (0.14)	4.91*** (0.76)	7.36*** (0.57)	35.2*** (2.75)	
• Interact with Black	-0.77 (0.54)	-0.92 (0.73)	-3.29* (1.65)	-3.21** (1.4)	-14.73** (7.19)	
• Interact with Hispanic	0.55 (0.34)	1.89*** (0.50)	1.80 (1.77)	0.66 (1.72)	2.95 (8.33)	
Taxes Lag 2 years:						
Blacks (p-value)	0.53	0.78	0.30	0.00	0.00	
Hispanics (p-value)	0.00	0.00	0.00	0.00	0.00	

TABLE 2—THE IMPACT OF FISCAL POLICY INSTRUMENTS ON UNEMPLOYMENT
(RECESSIONARY PERIODS) (*continued*)

Labor Force Participants	Full Sample		Change in Employment Status		
	Y=1 if Unemployed (Recessions)	LPM	LPM	LPM	LPM/FE
	(1)	(2)	(3)	(4)	(5)
Defense Lag 1 Year (*1000)	-0.80*** (0.20)	-0.4*** (0.10)	-0.60 (0.80)	5.6*** (0.50)	26.6*** (2.7)
• Interact with Black	-2.8*** (0.60)	-2.4*** (0.90)	-3.1 (1.9)	-3.9*** (1.4)	-18.9*** (6.8)
• Interact with Hispanic	-2.8*** (0.40)	-1.7*** (0.50)	-5.3*** (1.3)	-1.1 (1.4)	-5.5 (6.9)
Defense Lag 2 Years (*1000)	1.5*** (0.20)	1.2*** (0.20)	4.4*** (0.60)	2.2*** (0.50)	11.2*** (2.2)
• Interact with Black	-0.2 (0.50)	-0.1 (0.60)	-3.4** (1.3)	-1.1 (1.2)	-5.8 (5.7)
• Interact with Hispanic	-0.8* (0.50)	-0.8 (0.50)	-5.0*** (0.90)	-1.5 (1.1)	-7.7 (5.6)
Defense Lag 2 years: Blacks (p-value)	0.01	0.03	0.39	0.32	0.30
Hispanics (p-value)	0.19	0.24	0.39	0.53	0.49
State/Trend/ State*Trend	X	X	X		
Individual FE				X	X
Observations	11, 427, 868	4, 042, 183	1, 471, 783		1, 157, 372
Unique Observations				375, 558	

Note: CPS monthly data during recessionary periods; specifically, years 1980-1983, 1990-1992, 2000-2003 and 2008-2010. The dependent variable is 1 for the unemployed and 0 for the employed. In col(3)-(5), the sample is limited to those whose employment (employed or unemployed) has changed. In addition to the controls above, all specifications include current changes in spending and taxes, each of which is interacted with Black and Hispanic; changes in federal funds rate—current, lagged one and two years—and those three variables interacted with Black and Hispanic. Additional controls include a fourth polynomial in age, a dummy for being married, and six educational attainment dummy variables. Standard errors are clustered at the state level for columns (1)-(3); standard errors are reported in parentheses for all specifications with significance denoted by: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 3—THE IMPACT OF FISCAL POLICY INSTRUMENTS ON UNEMPLOYMENT
(EXPANSIONARY PERIODS)

Changed Employment Status	All Years			Post 1990	Pre1990
	Y=1 if Unemployed (Expansions)	LPM (1)	LPM/FE (2)	CLFE (3)	LPM/FE (4)
Black	7.18*** (0.41)	9.88*** (1.45)	40.0*** (6.67)	12.9*** (1.91)	3.73 (2.9)
Hispanic	-1.40*** (0.52)	1.27 (1.4)	5.70 (6.3)	3.62** (1.8)	-6.53** (3.04)
Taxes Lag 1 Year	2.01*** (0.25)	0.28 (0.29)	0.81 (1.39)	5.33*** (0.43)	-1.65*** (0.53)
• Interact with Black	-1.02 (0.79)	-1.99*** (0.71)	-10.1*** (3.46)	-6.1*** (1.07)	1.48 (1.28)
• Interact with Hispanic	0.16 (0.62)	0.54 (0.81)	3.14 (3.91)	-1.89* (1.1)	1.29 (1.65)
Taxes Lag 2 Years	-2.82*** (0.30)	-2.92*** (0.23)	-14.4*** (1.08)	2.97*** (0.35)	-5.9*** (0.39)
• Interact with Black	0.86 (0.52)	1.65*** (0.56)	7.50*** (2.7)	-0.68 (0.86)	2.06** (0.95)
• Interact with Hispanic	0.50 (0.45)	1.01 (0.64)	5.04* (3.05)	-1.47 (0.91)	1.79 (1.19)
Tax Lag 2 years for Blacks (p-values)	0.00	0.01	0.01	0.00	0.00
Hispanic (p-values)	0.00	0.00	0.00	0.07	0.00

TABLE 3—THE IMPACT OF FISCAL POLICY INSTRUMENTS ON UNEMPLOYMENT
(EXPANSIONARY PERIODS) (*continued*)

Changed Employment Status	All Years			Post 1990	Pre1990
	Y=1 if Unemployed (Expansions)	LPM (1)	LPM/FE (2)	CLFE (3)	LPM/FE (4)
Defense Lag 1 year (*1000)	-7.3*** (1.2)	0.00 (1.0)	0.60 (5.0)	3.6*** (1.1)	-12.5*** (2.7)
• Interact with Black	-1.9 (2.0)	1.9 (2.4)	8.8 (12.4)	0.30 (2.7)	16.6** (6.6)
• Interact with Hispanic	-0.30 (1.5)	5.6** (2.5)	30.7** (12.6)	4.5* (2.7)	6.6 (8.4)
Defense Lag 2 years (*1000)	6.9** (2.6)	28.6*** (1.6)	147*** (8.0)	38.0*** (1.8)	-17.5*** (6.4)
• Interact with Black	-6.9 (4.6)	-3.9 (4.1)	-21.1 (20.3)	-13.9*** (4.5)	32.8** (15.5)
• Interact with Hispanic	-10.8*** (3.5)	4.8 (4.3)	25.2 (21.2)	-2.8 (4.6)	14.3 (19.9)
Defense Lag 2 years for Blacks (p-values)	0.99	0.00	0.00	0.00	0.28
Hispanic (p-values)	0.20	0.00	0.00	0.00	0.86
State/Trend/ State*Trend	X				
Individual FE		X	X	X	X
Observations	2,028,218		1,616,620		
Unique Observations		547,578		309,463	238,115

Note: CPS monthly data during expansionary periods; specifically, years 1976-1979, 1984-1989, 1993-1999, 2004-2007, and 2011-2012. For all columns, the sample is limited to individuals whose employment status has changed. The dependent variable is 1 for the unemployed and 0 for the employed. In addition to the controls above, all specifications include current changes in spending and taxes, each of which is interacted with Black and Hispanic; changes in the federal funds rate—current, lagged one and two years—and those three variables interacted with Black and Hispanic. Additional controls include a fourth polynomial in age, a dummy for being married, and six educational attainment dummy variables. Standard errors are clustered at the state level for columns (1) and (3), and are reported in parentheses for all specifications with significance denoted by: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 4—FISCAL POLICY INSTRUMENTS AND UNEMPLOYMENT BY GENDER

Y=1 if Unemployed (LPM/FE)	Recession		Expansions	
	Female	Male	Female	Male
	(1)	(2)	(3)	(4)
Black	2.5 (2.2)	9.5*** (2.1)	5.4** (2.3)	5.01** (2.4)
Hispanic	-2.60 (1.6)	-1.5 (1.4)	1.8 (1.8)	-0.3 (1.5)
Taxes Lag 1 Year	1.4*** (0.4)	1.9*** (0.3)	-0.4 (0.4)	0.8** (0.4)
• Interact with Black	-1.6 (0.98)	2.2** (0.9)	0.10 (0.98)	-4.1*** (1.01)
• Interact with Hispanic	-1.8 (1.2)	-1.06 (1.0)	0.52 (1.2)	0.77 (1.03)
Taxes Lag 2 Years	3.7*** (0.9)	10.0*** (0.74)	-3.02*** (0.34)	-2.9*** (0.30)
• Interact with Black	-3.8* (2.09)	-1.7 (2.0)	-0.24 (0.79)	3.50*** (0.80)
• Interact with Hispanic	4.1 (2.7)	-2.4 (2.1)	1.3 (0.98)	1.55* (0.80)
Taxes Lag 2 years for Blacks (p-values)	0.97	0.00	0.00	0.43
Hispanics (p-values)	0.002	0.00	0.07	0.07
Defense Lag 1 year (*1000)	3.6*** (0.8)	7.1*** (0.7)	-2.1 (1.5)	1.8 (1.4)
• Interact with Black	-3.7* (2.0)	-3.8* (1.9)	5.4 (3.4)	-3.2 (3.5)
• Interact with Hispanic	1.7 (2.2)	-3.5** (1.8)	4.1 (3.7)	7.4** (3.2)
Defense Lag 2 years (*1000)	0.83 (0.70)	3.2*** (0.6)	23.8*** (2.5)	31.7*** (2.2)
• Interact with Black	-0.40 (1.64)	-1.9 (1.6)	1.5 (5.7)	-1.7** (5.9)
• Interact with Hispanic	-1.5 (1.8)	-2.5* (1.4)	3.8 (6.5)	6.9 (5.4)
Defense Lag 2 years for Blacks (p-values)	0.77	0.38	0.00	0.00
Hispanics (p-values)	0.70	0.58	0.00	0.00
Observations	649,731	822,685	864,099	1,007,272
Unique Observations	181,685	199,872	259,903	265,945

TABLE 5—THE ADJUSTED EFFECT OF FISCAL POLICY INSTRUMENTS AFTER ACCOUNTING FOR SECTOR, INDUSTRY AND OCCUPATIONAL DIFFERENCES (RECESSIONS)

Y=1 if Unemployed (LPM)	Females			Males		
	(1)	(2)	(3)	(4)	(5)	(6)
Self-Employed		-10.1*** (0.60)			-14.1*** (0.65)	
Private Sector		2.7*** (0.51)			-0.13 (0.42)	
Taxes Lag 2 Years	2.0** (0.83)	12.2** (4.8)	1.3 (3.8)	6.9*** (1.0)	20.3*** (5.4)	3.9 (2.7)
• Interact with Black	-3.3 (2.0)	-3.2 (2.2)	-4.6** (2.3)	-2.8 (2.3)	-1.98 (2.3)	-4.3* (2.4)
• Interact with Hispanic	5.05 (3.2)	5.5* (3.03)	6.2* (3.15)	0.61 (1.8)	0.00 (1.9)	-0.72 (1.9)
• Interact with Self-Employed		-8.3** (3.9)			-12.5*** (3.6)	
• Interact with Private Sector		3.3 (2.1)			-5.2* (3.1)	
Taxes Lag 2 Years for:						
Blacks (p-values)	0.58	0.095	0.47	0.046	0.002	0.92
Hispanic (p-values)	0.011	0.00	0.12	0.00	0.00	0.29
Defense Lag 2 years (*1000)	3.8*** (0.8)	-4.9 (5.4)	3.8 (3.4)	4.9*** (0.7)	0.7 (3.8)	1.7 (2.3)
• Interact with Black	-4.2** (1.9)	-3.4* (1.8)	-4.8** (2.0)	-2.2 (1.7)	-2.1 (1.8)	-2.7 (1.9)
• Interact with Hispanic	-4.0** (1.7)	-3.3* (1.8)	-3.3* (2.0)	-5.6*** (1.4)	-5.3*** (1.4)	-5.2*** (1.5)
• Interact with Self-Employed		9.82** (3.7)			-1.72 (2.68)	
• Interact with Private Sector		6.97*** (2.3)			0.92 (2.26)	
Defense Lag 2 years for:						
Blacks (p-values)	0.78	0.14	0.79	0.045	0.72	0.74
Hispanic (p-values)	0.83	0.11	0.90	0.464	0.20	0.28
Industry Affiliation Controls		X			X	
Occupational Status Controls			X			X
State/Trend/State*Trend	X	X	X	X	X	X
Observations	649,647	626,137	592,538	822,136	798,324	738,849

TABLE 6—THE ADJUSTED EFFECT OF FISCAL POLICY INSTRUMENTS AFTER ACCOUNTING FOR SECTOR, INDUSTRY AND OCCUPATIONAL DIFFERENCES (EXPANSIONS)

Y=1 if Unemployed (LPM)	Females			Males		
	(1)	(2)	(3)	(4)	(5)	(6)
Self-Employed		−9.5*** (0.63)			−13.8*** (0.61)	
Private Sector		2.7*** (0.43)			−1.5*** (0.41)	
Taxes Lag 2 Years	−3.18*** (0.30)	−7.4*** (2.6)	−3.9*** (1.4)	−2.7*** (0.42)	−6.7*** (1.4)	−2.1 (1.5)
• Interact with Black	0.48 (0.62)	0.58 (0.61)	0.97 (0.62)	1.3 (0.77)	1.4* (0.81)	2.01** (0.78)
• Interact with Hispanic	0.72 (0.59)	1.1 (0.73)	1.6 (0.95)	1.1 (0.75)	1.6** (0.75)	1.1 (0.79)
• Interact with Self-Employed		−8.3** (3.9)			3.77*** (1.3)	
• Interact with Private Sector		3.3 (2.1)			1.39 (1.25)	
Taxes Lag 2 Years for:						
Blacks (p-values)	0.00	0.01	0.049	0.054	0.003	0.97
Hispanic (p-values)	0.00	0.018	0.23	0.012	0.003	0.58
Defense Lag 2 years (*1000)	4.5 (3.8)	−8.5 (16.6)	−4.6 (8.8)	8.8*** (2.2)	−14.6 (11.6)	4.4 (11.9)
• Interact with Black	−7.3 (5.8)	−4.0 (6.1)	−4.6 (6.4)	−5.5 (6.4)	−7.5 (6.0)	−8.7 (5.6)
• Interact with Hispanic	−7.7 (5.0)	−7.4 (5.3)	−9.5 (5.9)	−12.0*** (4.0)	−12.4*** (4.4)	−15.9*** (4.1)
• Interact with Self-Employed		15.4 (9.4)			10.8 (10.7)	
• Interact with Private Sector		6.9 (5.5)			11.7 (8.2)	
Defense Lag 2 years for:						
Blacks (p-values)	0.51	0.54	0.30	0.61	0.092	0.72
Hispanic (p-values)	0.28	0.40	0.13	0.43	0.030	0.33
Industry Affiliation Controls		X			X	
Occupational Status Controls			X			X
State/Trend/State*Trend	X	X	X	X	X	X
Observations	863,979	832,056	788,021	1,006,419	977,730	899,669

TABLE 7—CAN EXOGENOUS CHANGES IN FISCAL POLICY INFLUENCE LABOR FORCE PARTICIPATION?

Change in Labor Force Status Y=1 if Out of the Labor Force, 0 in Labor Force (LPM/FE)	Recessions		Expansions	
	Female (1)	Male (2)	Female (3)	Male (4)
Black	-2.48* (1.32)	8.36*** (1.72)	-8.87*** (1.33)	2.02 (1.72)
Hispanic	1.24 (1.07)	-3.92*** (1.38)	0.29 (1.24)	-6.05*** (1.64)
Taxes Lag 1 Year	-0.20 (0.25)	0.99*** (0.33)	-0.89*** (0.25)	0.89*** (0.32)
• Interact with Black	0.16 (0.65)	0.01 (0.85)	0.37 (0.64)	-1.18 (0.82)
• Interact with Hispanic	-0.56 (0.76)	-0.65 (1.01)	0.45 (0.71)	-2.65*** (0.94)
Taxes Lag 2 Years	-0.99* (0.52)	1.68** (0.71)	-0.95*** (0.20)	-0.46* (0.25)
• Interact with Black	-1.9 (1.38)	-3.40* (1.84)	0.42 (0.51)	1.10* (0.65)
• Interact with Hispanic	-0.07 (1.66)	1.02 (2.24)	0.01 (0.56)	0.89 (0.75)
Taxes Lag 2 years for: Blacks (p-values)	0.02	0.31	0.27	0.29
Hispanic (p-values)	0.50	0.21	0.08	0.55
Defense Lag 1 year (*1000)	-0.90* (0.50)	-1.3** (0.60)	-5.5*** (0.90)	-1.7 (1.1)
• Interact with Black	3.7*** (1.3)	1.4 (1.6)	-3.0 (2.3)	-4.8* (2.7)
• Interact with Hispanic	1.8 (1.3)	1.8 (1.7)	3.3 (2.3)	-0.10 (2.9)
Defense Lag 2 years (*1000)	-0.30 (0.40)	-0.80 (0.50)	-8.7*** (1.4)	-5.2*** (1.7)
• Interact with Black	3.0*** (1.1)	-1.4 (1.4)	2.2 (3.7)	-5.6 (4.5)
• Interact with Hispanic	1.5 (1.1)	-3.2** (1.4)	5.9 (3.7)	7.3 (4.8)
Defense Lag 2 years for: Blacks (p-values)	0.01	0.08	0.06	0.01
Hispanic (p-values)	0.29	0.00	0.42	0.64
Individual FE	X	X	X	X
Observations	1,643,744	976,133	2,348,228	1,353,122
Unique Observations	336,375	208,860	500,776	302,372

TABLE 8—CAN EXOGENOUS CHANGES IN FISCAL POLICY INFLUENCE THE DECISION TO WORK PART-TIME?

Change in Work Status Y=1 if Part-time, 0 Full-time	Recessions		Expansions	
	Female	Male	Female	Male
	(1)	(2)	(3)	(4)
Black	-8.5** (4.05)	-0.80 (5.02)	4.8 (4.5)	2.8 (5.4)
Hispanic	1.3 (2.8)	-6.3** (2.97)	1.5 (3.3)	1.7 (3.2)
Taxes Lag 1 Year	1.6** (0.7)	0.58 (0.72)	1.40** (0.67)	1.37* (0.77)
• Interact with Black	2.4 (1.9)	-2.3 (2.09)	-1.5 (1.7)	-4.2** (2.1)
• Interact with Hispanic	-0.31 (2.2)	0.98 (2.0)	0.28 (2.02)	0.28 (2.01)
Taxes Lag 2 Years	6.4*** (1.4)	7.6*** (1.54)	0.50 (0.53)	0.05 (0.60)
• Interact with Black	1.4 (4.0)	-0.23 (4.4)	-1.8 (1.4)	-0.24 (1.7)
• Interact with Hispanic	-0.45 (4.8)	2.9 (4.5)	1.7 (1.6)	1.7 (1.6)
Tax Lag 2 years for: Blacks (p-values)	0.035	0.071	0.34	0.90
Hispanic (p-values)	0.19	0.012	0.16	0.25
Defense Lag 1 year (*1000)	0.4 (1.3)	2.3 (1.5)	1.6 (2.3)	-0.8 (2.7)
• Interact with Black	-3.4 (3.6)	0.4 (4.2)	-7.6 (6.1)	-4.3 (7.4)
• Interact with Hispanic	-9.4** (3.7)	-5.0 (3.5)	3.6 (6.1)	4.9 (6.1)
Defense Lag 2 years (*1000)	-1.1 (1.1)	0.6 (1.2)	2.5 (3.9)	8.6* (4.4)
• Interact with Black	4.5 (3.1)	-2.8 (3.5)	-19.8* (10.2)	-12.1 (13.0)
• Interact with Hispanic	-4.0 (3.0)	-3.0 (2.7)	-6.3 (10.9)	-8.0 (10.4)
Defense Lag 2 years for: Blacks (p-values)	0.23	0.50	0.07	0.77
Hispanic (p-values)	0.066	0.33	0.71	0.95
Individual FE	X	X	X	X
Observations	220,665	219,984	293,285	269,227
Unique Observations	72,596	70,822	100,887	91,190

APPENDIX A—MOTIVATION BEHIND TAX CHANGES (2008-2011)

In summary, our conclusion that changes in tax liabilities during 2008-2011, is classified as endogenous tax changes, stems from direct statements made in the Economic Reports, issued by the US Office of the President, about all major changes in tax policy enacted during that period. For example, in 2008, the three tax policies implemented were: the Economic Stimulus Act, the Housing Assistance Tax Act of the Housing and Recovery Act, and the Emergency Economic Stabilization Act. The 2009 Economic Report (ERP, 2009) states the following about the intentions of policymakers concerning these three pieces of tax legislation:

“This [falling house prices] eventually threatened the solvency of several major financial institutions and ultimately resulted in several failures and forced mergers along with a major decline in the stock market beginning in late September. To respond to these problems, policymakers have undertaken a wide range of actions during the year, including: personal tax rebates and bonus depreciation allowances for business (the Economic Stimulus Act of 2008, enacted in February); support for the housing market (the Housing and Economic Recovery Act of 2008 in July); large-scale investment in financial assets (the Emergency Economic Stabilization Act of 2008 in October) (page 31).

The language above clearly states that these policies and the tax changes within them were enacted to prevent a major financial collapse of the US economy. In other words, these policies were targeted towards short-run economic outcomes, as opposed to exogenous tax changes, which are usually aimed at long-term goals, such as improving long-run output measures or balancing the budget.

In less than one month after his inauguration, President Obama signed the historical American Recovery and Reinvestment Tax Act in February 2009. The

Economic report (ERP, 2010) states: *“At an estimated cost of \$787 billion, the Act is the largest countercyclical fiscal action in American history. It provides tax cuts and increases in government spending equivalent to roughly 2 percent of GDP in 2009 and 2¼ percent of GDP in 2010”*(pg 52). Since the statement explicitly states that the Act is a countercyclical action, it will be classified as an endogenous tax change.

The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (ERP, 2011) and the Temporary Payroll Tax Cut Continuation Act of 2011(ERP, 2012)primarily consisted of extending tax cuts that were previously in place, which are not considered innovations. In addition to extending President Bush’s tax cuts, the Tax Relief Act of 2010 also extended unemployment insurance and included an additional payroll tax cut of 2 percentage points, in order “to boost consumption”, a short-run economic goal (pg 42).

Finally, the Patient Protection and Affordable Care Act of 2010, includes tax increases for Medicare, but they were not scheduled to go into effect until 2013. The motivation for this act comprised of various goals such as: 1.) alleviating the burden of the crisis by providing families with affordable health care; 2.) achieving the long term goal of reducing the deficit; and 3.) realizing ideological beliefs about notions of fairness, equality and redistribution as well as the role of government in providing affordable and high quality health care to its constituents. Thus, although some of these intentions imply that the tax increase associated with Medicare should be considered an exogenous tax change, the effect was not realized until 2013 and therefore, this is not included in our sample of interest.

TABLE A1—COEFFICIENTS OF INDUSTRY AFFILIATION AND INTERACTION TERMS
WITH FISCAL POLICY INSTRUMENTS

(CORRESPONDS TO TABLES 5 AND 6, COLUMNS 2 AND 5)

Y=1 if Unemployed	Recessions		Expansions	
	Females	Males	Females	Males
	(1)	(2)	(3)	(4)
Defense Spending (Lag 2 years) (*1000)	−4.9 (5.4)	0.7 (3.8)	−8.5 (16.6)	−14.6 (11.6)
Mining	−3.76* (1.97)	5.0*** (0.77)	2.96 (2.07)	1.4 (1.06)
Construction	2.63** (1.06)	2.7*** (0.69)	−0.57 (1.09)	−0.70 (0.71)
Manufacturing	0.04 (0.59)	2.7*** (0.62)	−2.7*** (0.67)	−1.3** (0.56)
Wholesale	−2.11*** (0.64)	0.18 (0.67)	−2.4*** (0.66)	−1.7** (0.6)
Transportation	−3.9*** (1.04)	−0.68 (0.74)	−4.74*** (1.1)	−3.4*** (0.57)
Information	1.1 (1.1)	1.07 (1.3)	0.48 (1.01)	−1.5* (0.87)
Financial Activity	−3.02*** (0.81)	−0.23 (0.94)	−5.2*** (0.80)	−3.1*** (0.90)
Professional/Bus	−1.8** (0.73)	1.7** (0.82)	−3.5*** (0.84)	−1.8* (0.90)
Education/Health	−7.7*** (0.73)	−3.9*** (0.72)	−6.98*** (0.82)	−5.5*** (0.81)
Hospitality	−0.68 (0.68)	1.7** (0.80)	−1.5** (0.67)	−0.47 (0.72)
Other Services	−6.4*** (0.69)	−1.1 (0.74)	−6.94*** (0.69)	−3.03*** (0.83)
Public Admin	1.8* (0.96)	4.2*** (0.85)	2.1** (0.93)	2.68** (1.09)
Defense Spending Interacted with: (*1000)				
Mining	5.3 (13)	2.9 (6.4)	−63.7** (24.9)	32.4 (20.3)
Construction	6.5 (6.7)	5.2* (2.7)	17.8 (18.8)	13.8 (9.3)
Manufacturing	5.7 (5.3)	11.3*** (2.4)	9.1 (18.6)	8.1 (9.9)

TABLE A1—COEFFICIENTS OF INDUSTRY AFFILIATION AND INTERACTION TERMS WITH FISCAL POLICY INSTRUMENTS (*continued*)

Y=1 if Unemployed	Recessions		Expansions	
	Females	Males	Females	Males
	(1)	(2)	(3)	(4)
Wholesale	2.1 (4.5)	5.1 (3.1)	11.0 (17.4)	12.0 (11.5)
Transportation	-1.6 (6.1)	6.0* (3.2)	2.0 (18.0)	9.3 (10.9)
Information	-2.1 (7.9)	-1.6 (5.1)	29.5 (22.6)	19.1* (9.6)
Financial Activity	1.9 (4.9)	5.9 (4.3)	8.3 (27.3)	-5.6 (13.4)
Professional/Bus	2.8 (5.8)	0.9 (2.9)	8.2 (16.7)	29.0** (11.5)
Education/Health	1.7 (5.4)	3.5 (3.6)	2.2 (16.4)	9.9 (9.7)
Hospitality	2.5 (4.6)	1.0 (3.3)	8.6 (17.9)	13.7 (10.5)
Other Services	-1.8 (6.2)	6.6** (3.3)	16.9 (17.8)	19.4 (13.9)
Public Admin	-8.3 (5.5)	-2.4 (7.8)	-12.7 (23.3)	38.1* (20.8)
Taxes (Lag 2 years)	12** (4.8)	20*** (5.4)	-7.4*** (2.6)	-6.7*** (1.4)
Taxes (Lag 2 years) Interacted with:				
Mining	-1.3 (12.8)	-6.7 (5.03)	-10.4** (4.05)	1.07 (2.3)
Construction	0.52 (6.9)	-3.4 (3.6)	0.55 (2.8)	1.1 (1.1)
Manufacturing	-8.8 (5.5)	-6.6* (3.7)	1.58 (2.5)	2.5** (1.0)
Wholesale	-5.2 (5.5)	-7.7** (3.5)	0.27 (2.5)	2.98*** (1.03)

TABLE A1—COEFFICIENTS OF INDUSTRY AFFILIATION AND INTERACTION TERMS
WITH FISCAL POLICY INSTRUMENTS (*continued*)

Y=1 if Unemployed	Recessions		Expansions	
	Females	Males	Females	Males
	(1)	(2)	(3)	(4)
Transportation	−5.8 (8.8)	−9.5** (3.6)	4.4 (3.02)	0.98 (1.4)
Information	−14.4* (8.05)	−15.5** (7.6)	6.79* (3.65)	3.7 (2.3)
Financial Activity	−13.6** (6.7)	−14.2*** (4.8)	2.59 (2.14)	1.8 (1.52)
Professional/Bus	−15.4** (6.5)	−15.1*** (3.9)	3.78* (1.97)	5.4*** (1.3)
Education/Health	−12.7** (4.9)	−18*** (4.6)	1.25 (2.3)	3.8** (1.6)
Hospitality	−2.7 (6.5)	−12*** (4.2)	7.03*** (2.4)	3.6* (1.8)
Other Services	−13.9** (5.7)	−12.6*** (4.3)	3.9 (2.6)	4.6*** (1.4)
Public Admin	−16.6*** (5.1)	−14.6*** (4.7)	1.3 (3.1)	3.04 (2.4)
Observations	626, 137	798, 324	832, 056	977, 730

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

TABLE A2—COEFFICIENTS OF OCCUPATIONAL STATUS AND INTERACTION TERMS WITH FISCAL POLICY INSTRUMENTS

(CORRESPONDS TO TABLES 5 AND 6, COLUMNS 3 AND 6)

Y=1 if Unemployed	Recessions		Expansions	
	Females	Males	Females	Males
	(1)	(2)	(3)	(4)
Defense Spending Lag 2 years (*1000)	3.8 (3.4)	1.7 (2.3)	-4.6 (8.8)	4.4 (11.9)
Academics	-2.1* (1.2)	-1.8* (0.93)	-3.6*** (0.70)	-3.5*** (0.70)
Professionals	-6.7*** (0.62)	-4.8*** (0.77)	-6.2*** (0.49)	-3.8*** (0.85)
Associates/Tech	-6.7*** (0.66)	-4.5*** (0.76)	-4.4*** (0.66)	-4.5*** (0.58)
Clerical Workers	-2.02*** (0.55)	-2.2*** (0.74)	-2.6*** (0.40)	-2.6*** (0.62)
Sales & Service	-2.8*** (0.48)	-2.8*** (0.55)	-2.07*** (0.47)	-2.8*** (0.53)
Agriculture	3.1** (1.2)	2.1 (1.5)	3.1** (1.3)	0.44 (1.04)
Craft/Trades	0.54 (0.94)	2*** (0.60)	-0.07 (0.80)	-2.5*** (0.55)
Machine Operator	2.7*** (0.77)	1.2* (0.62)	-0.91 (0.73)	-3.08*** (0.63)
Elementary Occupations	-3.5*** (0.65)	-3.01*** (0.67)	-2.8*** (0.52)	-1.9*** (0.63)
Defense Spending (Lag 2 years) Interacted with: (*1000)				
Academics	-3.8 (7.3)	2.2 (3.7)	40.2*** (11.4)	13.3 (15.2)
Professionals	-4.1 (3.6)	-0.5 (3.0)	0.7 (8.4)	-1.3 (16.2)
Associates/Tech	0.3 (5.2)	-4.8 (5.0)	-6.6 (9.6)	-17.8 (12.2)
Clerical Workers	0.3 (4.1)	4.0 (4.0)	11.8 (9.7)	24.3* (14.3)
Sales & Service	-0.2 (3.6)	0.1 (3.1)	14.1* (7.7)	12.5 (11.6)
Agriculture	-5.1 (6.5)	-8.1 (5.3)	29.5* (16.0)	32.6 (33.4)

TABLE A2—COEFFICIENTS OF OCCUPATIONAL STATUS AND INTERACTION
TERMS WITH FISCAL POLICY INSTRUMENTS (*continued*)

Y=1 if Unemployed	Recessions		Expansions	
	Females	Males	Females	Males
	(1)	(2)	(3)	(4)
Craft/Trades	6.2 (6.9)	1.9 (3.1)	28.3 (26.9)	17.5* (10.3)
Machine Operator	-3.5 (4.5)	0.7 (3.2)	12.7 (12.0)	5.9 (12.1)
Elementary Occupations	-0.6 (3.3)	5.1* (2.7)	19.5** (8.3)	7.7 (10.3)
Tax Changes (Lag 2 years)	1.3 (3.8)	3.9 (2.7)	-3.9*** (1.4)	-2.07 (1.5)
Taxes (lag 2 years) Interacted with:				
Academics	-1.95 (6.9)	-1.6 (5.5)	4.67* (2.6)	0.18 (3.2)
Professionals	-0.85 (4.3)	-3.5 (4.1)	1.1 (1.3)	-0.71 (2.2)
Associates/Tech	1.98 (4.5)	4.0 (3.6)	-0.95 (1.4)	-1.5 (1.8)
Clerical Workers	-1.07 (4.2)	0.78 (3.6)	1.3 (1.4)	1.7 (1.96)
Sales & Service	4.8 (4.07)	-2.4 (3.08)	0.64 (1.6)	2.7 (1.7)
Agriculture	30 (52.9)	-18.5 (29.4)	4.07 (4.01)	5.8 (3.7)
Craft/Trades	-13.9** (6.4)	-10.4*** (2.3)	11*** (3.9)	5.6*** (1.6)
Machine Operator	-2.7 (4.8)	0.08 (3.2)	2.06 (1.7)	1.09 (1.8)
Elementary Occupations	5.2 (3.9)	11*** (2.9)	-1.1 (1.5)	-3.9** (1.5)
Observations	592, 538	738, 849	788, 021	899, 669

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$