Effects of a Higher Minimum Wage in the District of Columbia

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Executive Summary

The minimum wage establishes a lower bound on what employers must pay their workers, and economic theory suggests higher minimum wages could either cause lower employment or higher employment (Schmidt 2013 summarizes theory). Over the next two years, the minimum wage in DC will increase in stages, ultimately reaching $11.50 in July 2016, and thereafter DC's minimum wage will increase with inflation (the federal minimum wage does not rise with inflation); we would like to know the likely impact of these changes on employment.

National research on the employment effects of the minimum wage may not apply directly to DC given its demography, geography, and economy. To see how raising the minimum wage might affect employment (and earnings) in DC, we consider what happened in 1993 when DC raised its minimum wage ahead of other local jurisdictions. We also consider how small area differences in minimum wages affect employment for populations similar to those of DC using statistical methods adapted from other researchers.

Specifically, we combine county-level data from the Quarterly Census of Employment and Wages and the 2000 Census to explore how an increase in the DC minimum wage would affect workers in the food service industry. We weight the data to find counties that are similar to DC in a variety of dimensions, including race and ethnicity, marriage, educational attainment, and population density. We follow existing research to compare counties along state borders that have different minimum wages.

- We find no clear evidence of a decline in employment in DC following the increase in the minimum wage in 1993. In the eight quarters following the change in the minimum wage, employment in the food service industry, for example, increased; by comparison, employment either grew more slowly or was unchanged in neighboring areas (see figure ES.1).
- We estimate a number of different regressions to try to uncover a statistically meaningful relationship between changes in the minimum wage and employment levels in the food service industry (see figure ES.2). Only two suggest a statistically meaningful relationship between changes in the minimum wage and employment; one suggests an increase in the minimum wage causes a decline in employment while another suggests an increase in employment.
- Our preferred estimates—shown in orange in figure ES.2—restrict the sample to all contiguous counties that straddle a state boundary. (This approach attempts to compare counties that are similar in ways except for the minimum wage). Those estimates suggest that there is no statistically meaningful relationship between changes in the minimum wage and employment.

Evolution of Restaurant Employment in DC and Surrounding Areas

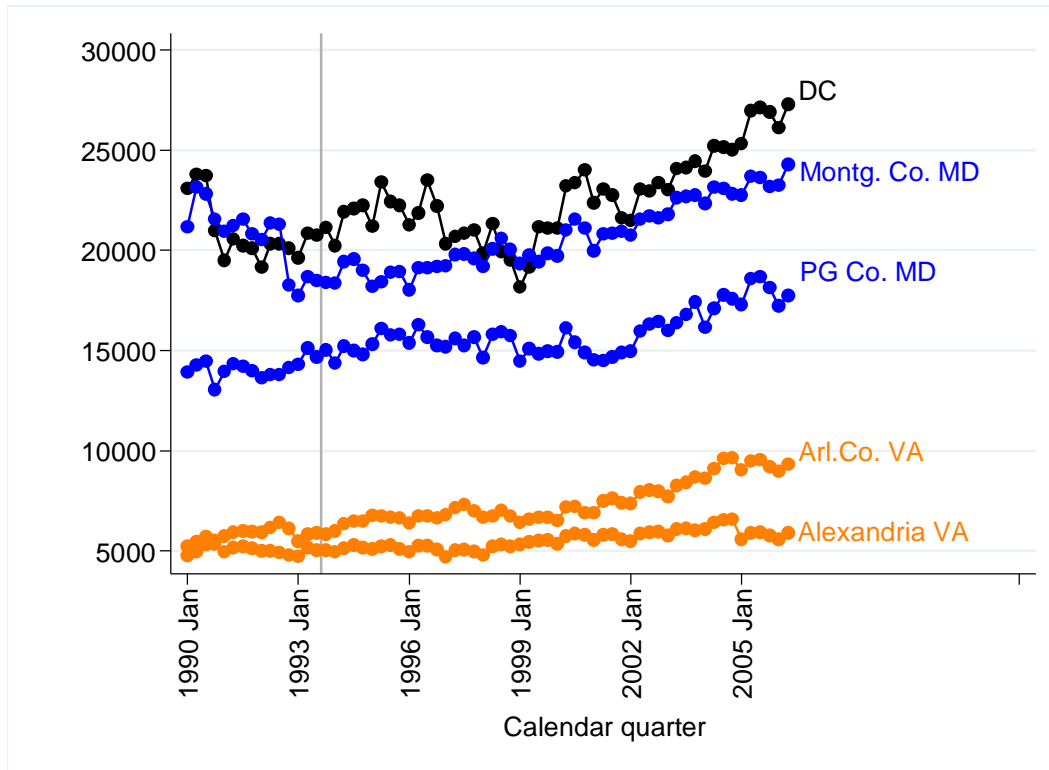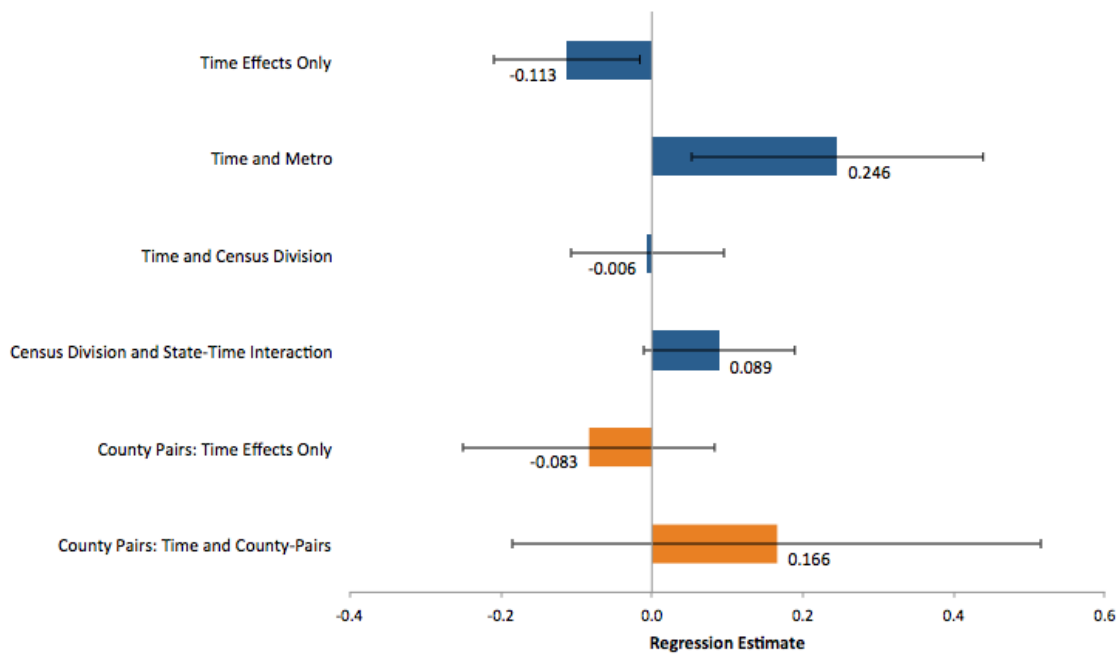FIGURE ES.2

Estimated Impacts of Minimum Wage Increases on Employment

Notes: Estimates are weighted based on how similar other counties are to DC. Regressions include controls for population and employment.

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The District of Columbia will increase its minimum wage, currently at $8.25 an hour (one dollar above the federal minimum), in several stages over the coming two years. As of July 1, the DC minimum wage rises to $9.50. In July of 2015, it will rise another dollar, and on July 1, 2016 it will rise another dollar to $11.50, after which it will rise with inflation. Each of these increases may seem large, but they are dwarfed in percentage terms by the increase at the end of 1993,[1] which raised the minimum wage from 4.25 to 5.25 at a time when neighboring jurisdictions in Maryland and Virginia did not change their policy. We can learn from these past changes in policy about the likely impacts of the new policy changes on employment and earnings in DC.

Proponents of increasing the minimum wage view it as a way to increase earnings of low-income households; critics contend that a higher minimum wage will raise employers' labor costs, driving some reduce the number of employees they hire, perhaps switching to a business model that uses more capital and less labor. Critics also worry that firms might be driven out of business or to other areas with lower minimum wage, or that employers may pass the increased costs onto consumers in the form of higher prices. We focus on the most commonly cited downside of higher minimum wages, decreased employment levels, and the upside of higher earnings, and examine impacts in DC specifically.

What sets DC apart from many other states or jurisdictions is its unique geographic, demographic, and economic characteristics. DC is surrounded by two states—Maryland and Virginia—whose minimum wage is equal to the federal minimum wage (though the Maryland counties closest to DC are also raising their minimum wages to $11.50 per hour by 2017). Demographically, almost two-thirds of DC's population (62 percent) is Black, Asian, and Latino compared with 34 percent of the US population. DC's population is also 4 years younger, on average, than the US population: In the District, 13.2 percent of the population is between the ages of 18 and 24 compared with 10 percent of the United States. Economically, most employment in the District is in the service industry: goods-producing industries such as manufacturing, natural resources, and construction account for less than 5 percent of all employment in DC, but 19 percent in the United States overall. Service-sector jobs tend to be pay less than jobs in goods-producing sectors and hence are more likely to be affected by minimum wage policies.

This research memo examines the potential impact an increase in the minimum wage might have on the earnings and employment levels of low-income residents. To do so, we follow recent work of Dube, Lester, and Reich (2010), but modify the approach to make a more apt comparison to DC. We do not examine potential spillover effects, such as changes in residents' eligibility for tax-and-transfer programs, such as the Earned Income Tax Credit, Supplemental Nutrition Assistance Program, or child care subsidies.

We use nationwide data for all county-sized jurisdictions on either side of such a minimum wage policy change. Using the same data in an earlier study, Dube, Lester, and Reich (2010) found that between 1990 and 2006, average wages increased but *employment did not change* following local increases in the minimum wage in the industries with large proportions of low-wage workers. Dube, Naidu, and Reich (2010) reach a similar finding when comparing San Francisco and nearby Alameda county.

In Section 2, we review prior research on the minimum wage and describe the context for this study. In Section 3, we describe the challenges of evaluating employment impacts, describe our approach and the data used.

In Section 4, we compare employment patterns before and after the large DC policy change at the end of 1993, comparing to the neighboring four counties in Maryland and Virginia, where there were no policy changes at that time.

In Section 5, we compare DC to all other counties, weighting the populations of all other counties to represent a counterfactual for DC. We also compare all counties that experienced a change in the minimum wage to counties that did not, but weight all counties so they represent a population similar to DC in urbanicity and composition (race/ethnicity and educational attainment).

Section 6 reviews our findings and discusses implications. Broadly speaking, we find no evidence that increased minimum wages of magnitudes comparable to the recent DC policy change have had any impacts on employment levels but that they have raised wages of affected workers. To the extent that there are employment impacts, the impacts seem to be smaller in places with characteristics similar to DC, in densely populated counties with large minority populations and low marriage prevalence.

Background and Previous Literature

Except in a few specific industries, the minimum wage establishes a lower bound on what most employers must pay most workers. The United States introduced the federal minimum wage in 1938, though some states had set minimum wages for many jobs beginning in 1918. The federal minimum wage was initially set at $0.25 an hour (the equivalent of $4.15 today). The federal minimum wage was expanded to greater numbers of workers during the 1960's so that it covered 80 percent of workers by 1970 (Gavett 1970) and the lower bound was raised on multiple occasions, most recently in 2009, to $7.25 per hour. Despite periodic increases in the federal minimum wage, it is lower today after accounting for inflation than it was in 1976 ($9.45 an hour), although somewhat higher than it was in 1989 ($6.32 an hour in today's dollars), after nearly a decade of no increase in its nominal value.

States, cities, and counties use minimum wages and living wage ordinances to provide additional supports to low-wage workers. Currently, 19 states and the District of Columbia have established minimum wages somewhat above the federal minimum. In 2013, DC's minimum wage was one dollar higher than the federal minimum while the minimum wage in the neighboring jurisdictions of Maryland and Virginia used the federal minimum wage of $7.25 an hour. The minimum wage in the two Maryland counties bordering DC (Prince Georges and Montgomery Counties) will rise to $11.50 an hour by 2017. Minimum wages for other Maryland residents will also rise, to $8.25 per hour in July 2015, $8.75 per hour in July 2016, $9.25 per hour in July 2017, and to $10.10 in July 2018. Virginia minimum wages are not slated to change.

There are hundreds of studies that attempt to measure the earnings and employment effects of raising the minimum wage. Methodologically speaking, studies tend to fall into two broad groups. The first group consists of studies that compare changes in earnings or employment in adjacent local areas with different minimum wages. In general, these studies find small or no effect of the minimum wage on earnings or employment. The second group consists of studies that use national-level data; that is, they compare variation and changes in the minimum wage across states over time. The results from these types of studies are typically more mixed, but have a greater propensity to find negative results of the minimum wage on employment.

Figure 1 shows the distribution of more than 400 estimates of the relationship between the minimum wage and employment (or hours worked) collected from more than 70 studies by Belman and Wolfson.[2] The estimates are of elasticities of employment with respect to minimum wages (the percentage change in employment associated with a percentage change in minimum wages), and range from about -1.5 to +1.5 with the bulk of estimates between -0.5 and 0.5 (-0.5 implies a 10 percent *decrease* in employment for a 20 percent increase in minimum wages, whereas 0.5 implies a 10 percent *increase* in employment for a 20 percent increase in minimum wages). The distribution is roughly symmetrical around the average elasticity of -0.07 (the median is -0.05). We have also added the two preferred estimates from Dube, Lester, and Reich (2010) and discuss those estimates further below.

FIGURE I

Estimated Impacts of Minimum Wage Increases on Employment
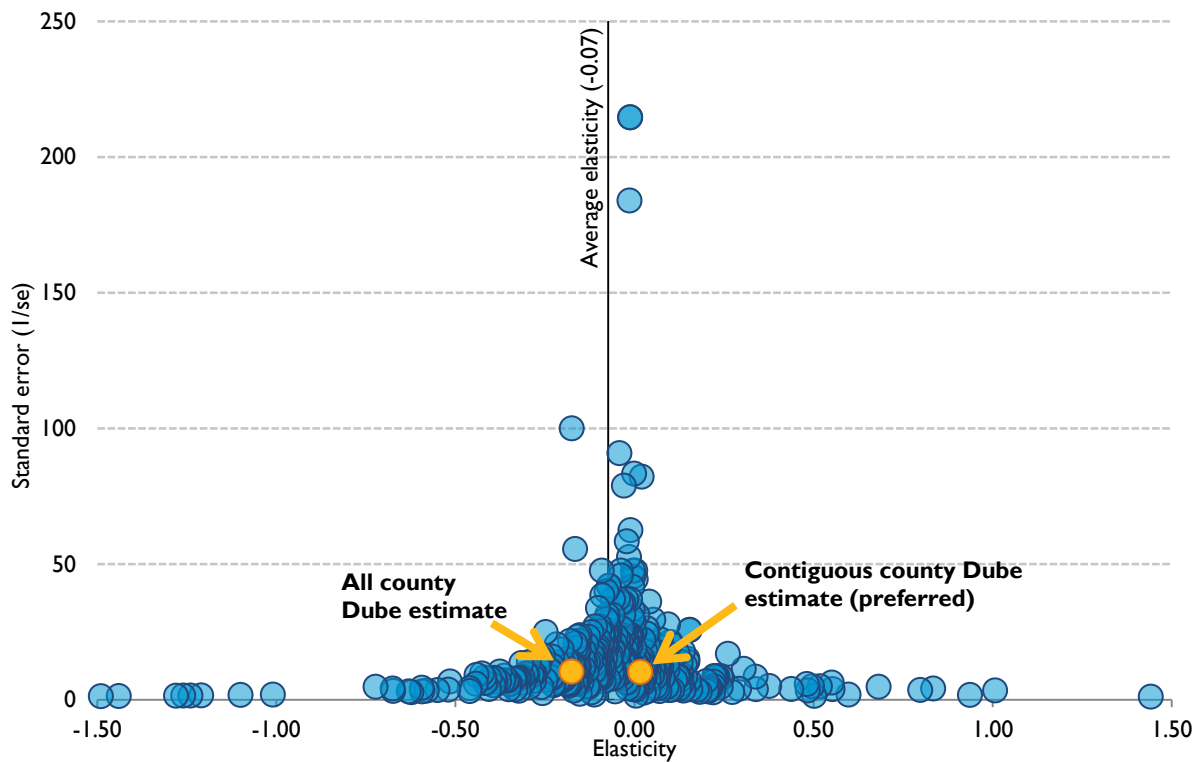
Sources: Belman and Wolfson (2014) and Dube, Lester, and Reich (2010).

We base our empirical estimates on work by Dube, Lester, and Reich (2010), hereafter DLR. In that study, the authors base their analysis on a sample of workers in the restaurant industry. About one-third of restaurant workers earn within 10 percent of the minimum wage; thus it is an important industry to study. The DLR sample is made up of all counties in the United States, and a second set of estimates restricts the sample to all contiguous counties that straddle a state boundary. In all, their first sample consists of 1,381 counties (out of the 3,081 counties in the United States) and the second sample consists of 504 counties. The contiguous border county sample forms a unique group of geographic regions with which to examine the impact of the minimum wage on earnings and employment. Such county pairs are more similar in geographic and employment dimensions than are county pairs that not adjacent, and that do not straddle a state boundary.

The DLR specification takes into account total private sector employment and county-level employment in each year for which the authors have data. They also test for the inclusion of other control variables, such as differential time trends across states and longer differences in employment over time. Altogether, in their preferred specification using the contiguous border county sample, the authors find that a 10 percent increase in the minimum wage is associated with a 1.88 percent increase in earnings and a 0.16 percent increase in employment.[3]

We plot these two employment estimates in figure 1 to show the DLR estimate from the full sample (on the left) and the preferred DLR estimate from the contiguous county sample (on the right). Both estimates sit near the center of the distribution, though their preferred estimate is to the right of zero, indicating that increased minimum wages have a small *positive* impact on employment.

Evaluation Framework and Data

Establishing causality between changes in the minimum wage and employment is extremely difficult. In the context of minimum wage changes, changing the unit of analysis from the national or state level to the county level cannot wholly sidestep this causal inference problem. This problem exists in a county-level analysis because employers can relocate from one county to another and in so doing would be counted twice in the analysis—first, as a reduction in employment in a county with a higher minimum wage and again as an increase in employment in a county with an unchanged minimum wage. Therefore, changes in employment in adjacent counties will tend to overstate the overall causal impact of the minimum wage. In other words, if a DC resident loses his or her job because of a change in the DC minimum wage, that same worker may find employment in the surrounding areas in Maryland or Virginia. This behavior is analogous to measuring the impact of changes in capital gains and tax realizations; because gains can be relocated across time, the short-run relationship (i.e., elasticity) of gains with respect to the tax rate is much larger in magnitude than the long-run relationship (Slemrod 1995).

This means that finding negative impacts of changes in the minimum wage on employment does not necessarily indicate that the *causal* impact of a minimum wage increase is to lower employment. In fact, a minimum wage-employment relationship estimated at the local level—say, at the county level—is expected to be much larger in magnitude than the relationship measured, say, nationwide. However, if we fail to find negative impacts on employment, we may take that as evidence of *no causal* impact, because the preponderance of likely bias is in the direction of larger negative impacts across county boundaries. In sum, finding small or no impacts of minimum wage changes on employment across county boundaries is strong evidence of no impact, in a way that finding a negative impact would not be strong evidence for a true causal impact.

With the DLR approach in hand, we turn to drawing a more realistic comparison to the Washington, DC experience. To do so, we start with the DLR all county and contiguous county samples, then we find counties that are similar to DC in dimensions of race, population density, and occupation. We then weight our sample based on how similar other counties are to DC; in other words, we modify our model such that counties that are less similar to DC are given less importance in the model while counties that are more similar to DC are given more importance.

Our data are drawn from several sources: the Quarterly Census of Employment and Wages (QCEW) and the 2000 Census. We also use county-level identifiers and minimum wages provided by DLR. The QCEW provides quarterly county-level payroll data by detailed industry. The data are based on required quarterly employer filings (the so-called ES-202 form) that are used to calculate payroll taxes related to the unemployment insurance program. As in DLR, we construct a panel of quarterly observations of county-level employment and earnings for Full Service Restaurants and Limited Service Restaurants. Our sample extends from the first quarter of 1990 to the last quarter of 2006 and we keep all 2,312 counties with 66 quarters of total employment data yielding 152,592 county-quarter observations.

We use the 2000 Census to generate demographic and economic statistics at the county level. The Census, however, does not contain county-level identifiers. Instead, we use the Public Use Microdata Area (PUMA) geographic identifier, which are geographic areas defined by the US Census Bureau that contain at least 100,000 people and are contained within a single state. We then map those geographies to the county-level using the MABLE/*Geocorr2K* tool from the Missouri Census Data Center.[4]

We generate eight measures of demographic and economic characteristics of the 2,312counties in our sample: percent Hispanic; percent non-Hispanic Black; percent immigrant; percent with less than a college education; percent married; percent male; the labor force participation rate; and the share of workers in the food service industry. Relative to all other counties in our sample, DC has a higher share of Hispanics and non-Hispanic Blacks, moderately higher population density, and extremely low rates of married persons.

We use a weighting mechanism based on propensity score methods (Nichols 2007, 2008). This approach assigns larger weights to counties that are similar to DC and smaller weights to counties that are different from DC. The weights are based on a (logit) regression equation in which we predict the probability of being similar to DC based on indicators for large and small proportion of Hispanic residents; share of African American residents; share of residents with less than a college degree; the share of married residents; and measures of population density.[5]

Results Comparing DC with Neighboring Counties

It is useful to first focus on the large increase in the DC minimum wage during the last quarter of 1993, which raised the minimum wage from $4.25 to $5.25 at a time when neighboring jurisdictions in Maryland and Virginia did not change their minimum wage policy (figure 2). In October 1996, the federal minimum wage was increased from $4.25 to $4.75 per hour and then again to $5.15 per hour in September 1997. The minimum wage in DC maintained the gap between it and surrounding Maryland and Virginia by pegging changes in its minimum wage to changes in the federal minimum wage.

Evolution of the Minimum Wage in DC and Surrounding Areas
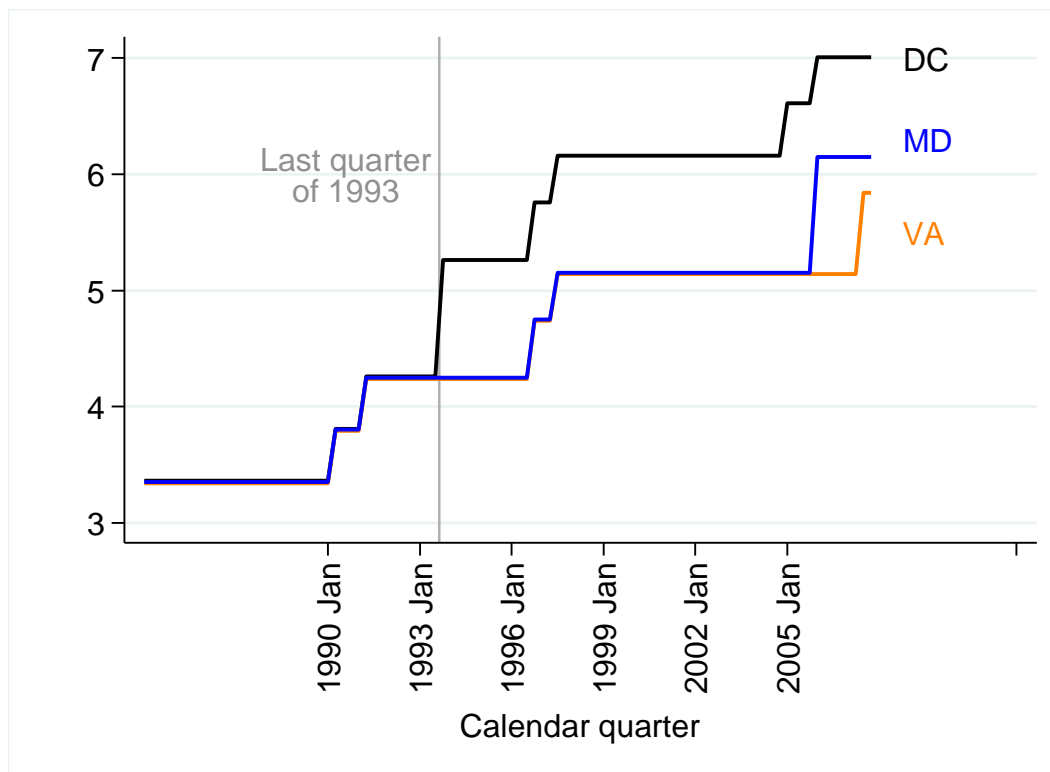
There is no clear evidence of an employment decline in DC following the 1993 increase in the minimum wage compared with neighboring jurisdictions. Figure 3 shows employment levels in the food service industry in different areas in and around DC. As noted, the food service industry has a very high proportion of workers who are affected by the minimum wage.[6] In the 8 quarters after the change in the DC minimum wage, employment in the DC food service industry increased; by comparison, employment either grew more slowly or was unchanged in neighboring areas.

FIGURE 3

Evolution of Restaurant Employment in DC and Surrounding Areas
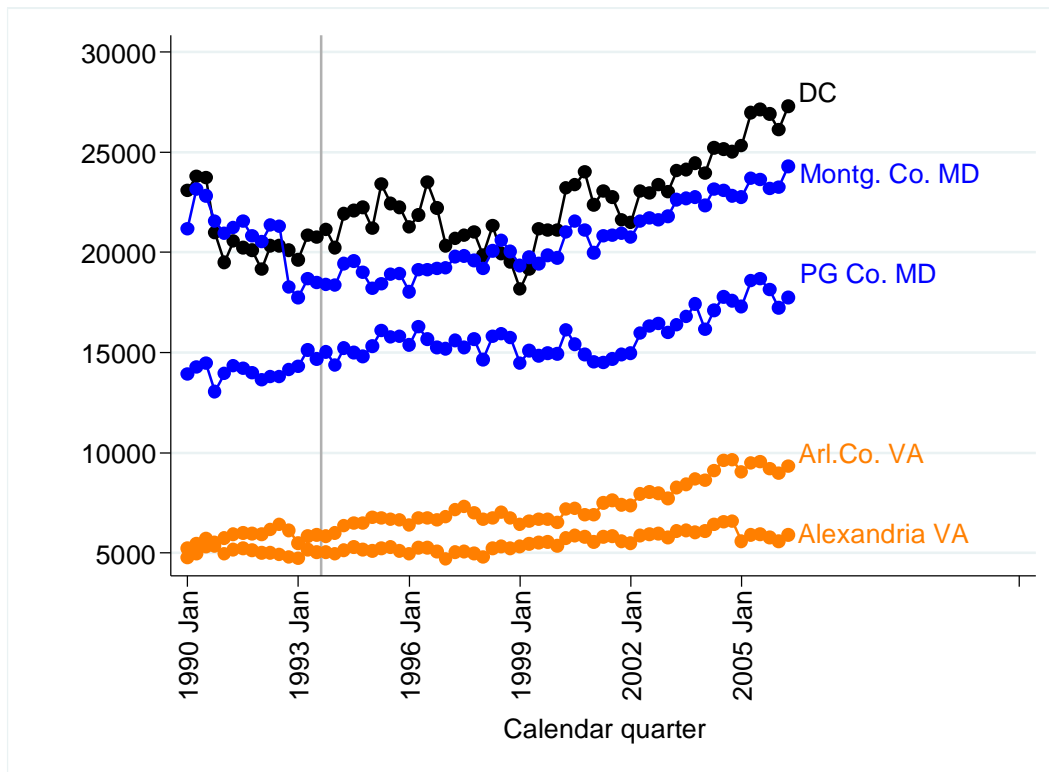
The retail industry also has a very high proportion of people affected by the minimum wage. In this industry, there is also no clear evidence of a negative impact of the large increase in the minimum wage in DC, though there is clearly a long-term decline in that sector in DC (figure 4). If anything, the trend in retail employment improved in the 8 quarters after the change in policy. Similar observations can be made of manufacturing industries (figure 5) though the Virginia counties do not contribute data to this comparison. We also observe similar patterns in the finance, insurance, and real estate (FIRE) sector (figure 6).

Aggregating across all low-wage industries (figure 7) or across all industries (total employment in figure 8) produce similar pictures. Both low-wage and total employment in DC exhibited a flat trend prior to and following the change in the minimum wage in 1993; only by 1999 did employment in DC begin to rise. In neighboring Montgomery County, Maryland did total employment rise continuously over the period; total employment in neighboring Prince George's County, Maryland, Arlington County, Virginia, Alexandria, Virginia, were relatively flat over the period. We view these patterns as evidence that the change in the minimum wage in DC in 1993 did not adversely affect total employment in DC.

FIGURE 4

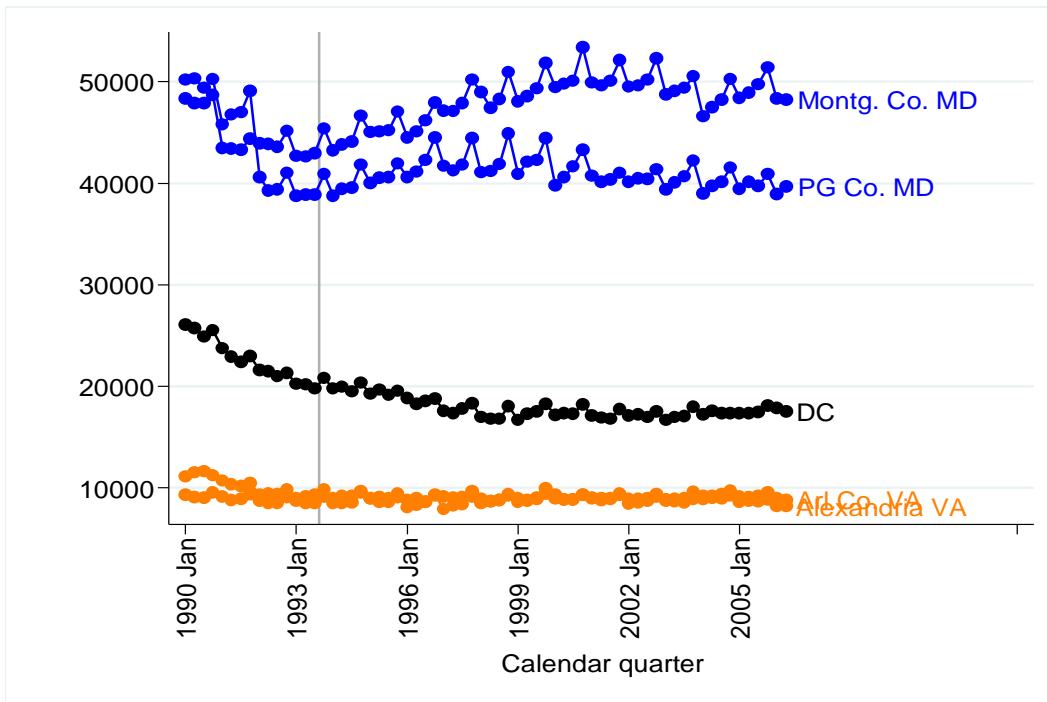**Evolution of Retail Employment in DC and Surrounding Areas**

Evolution of Manufacturing Employment in DC and Surrounding Areas
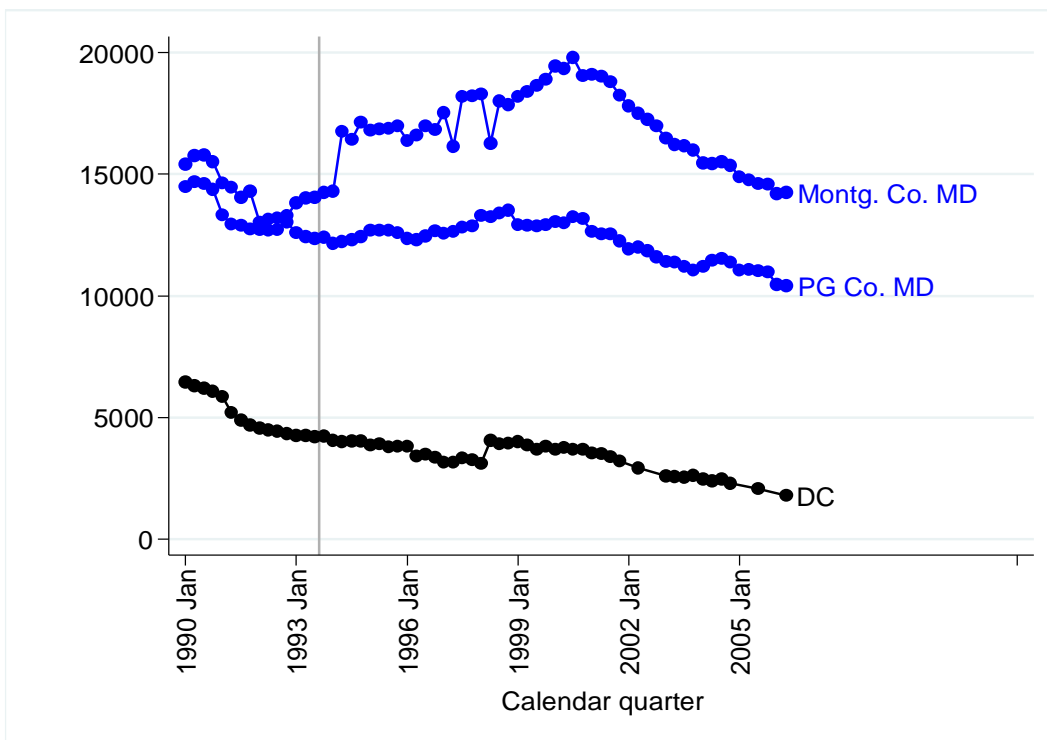
FIGURE 5

FIGURE 6

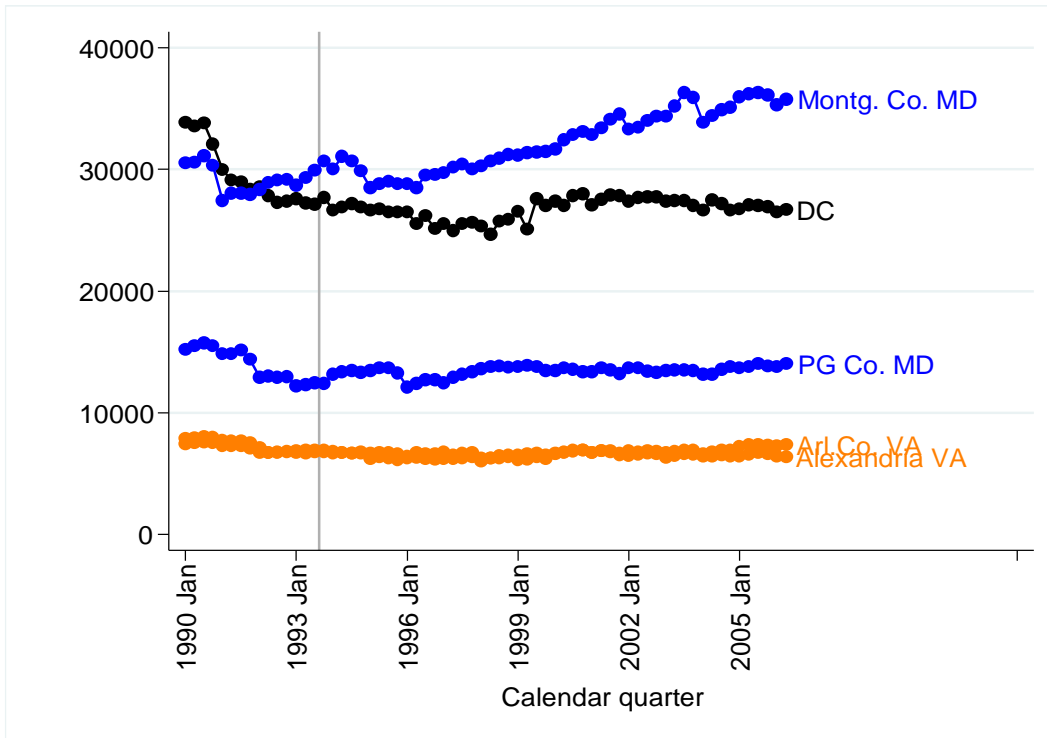**Evolution of FIRE Employment in DC and Surrounding Areas**

FIGURE 7

Evolution of Low Wage Industries' Employment in DC and Surrounding Areas
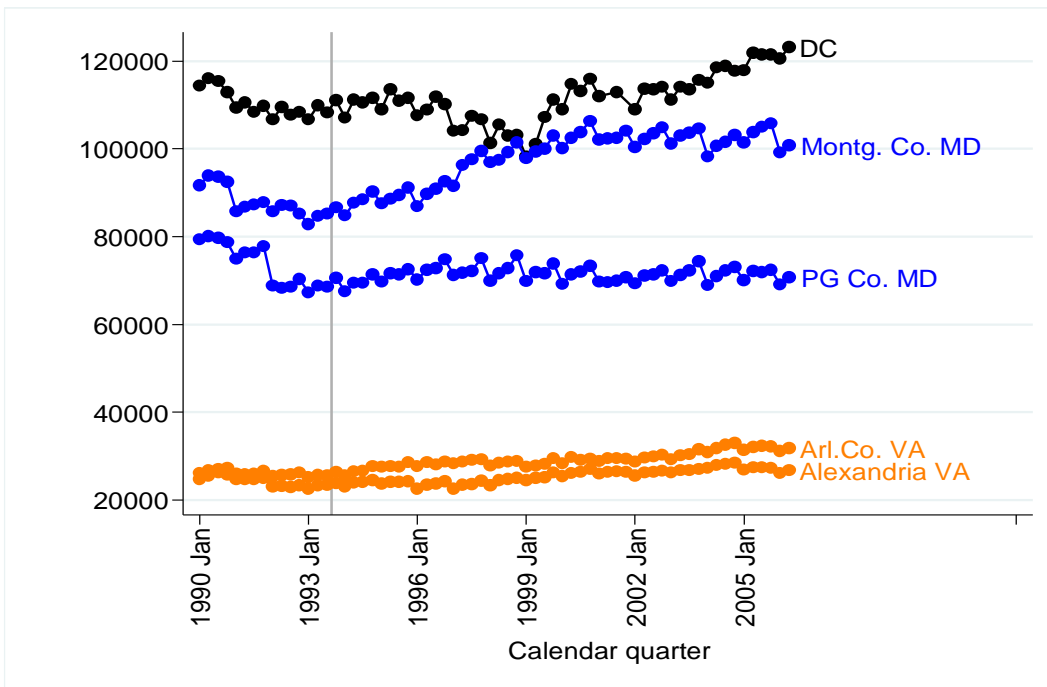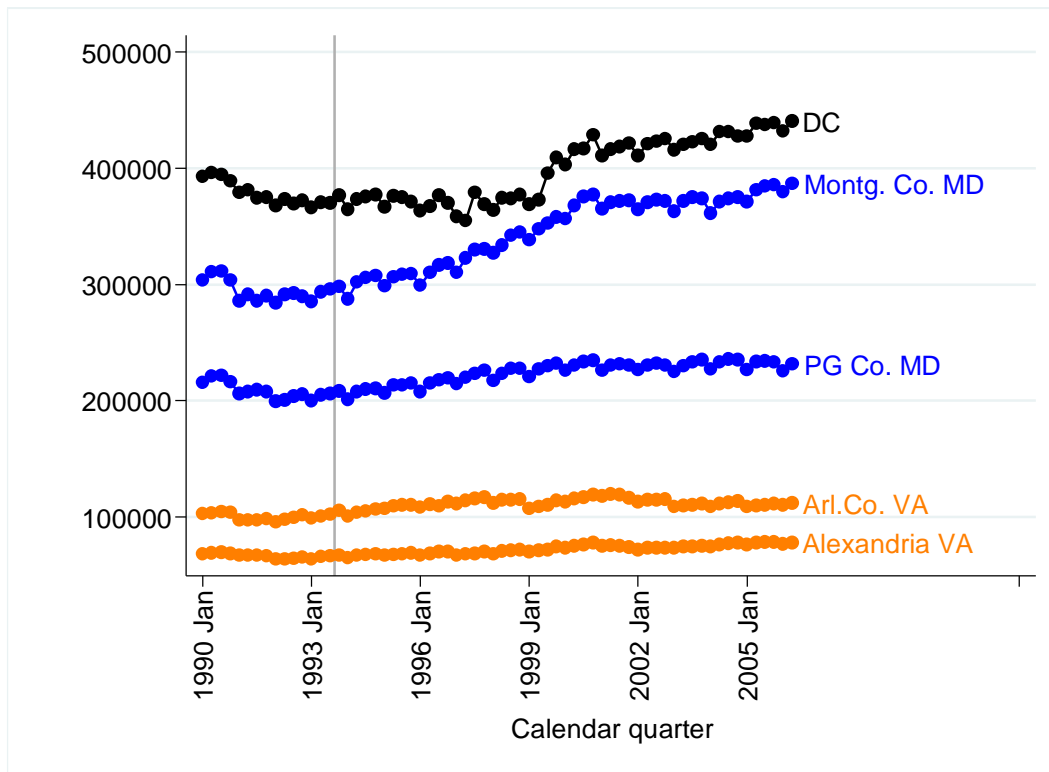
FIGURE 8

Evolution of Total Employment in DC and Surrounding Areas

Regressions Comparing All Counties

We explore the impact of minimum wage changes in the food service industry—the group pictured in figure 3—based on observations for all counties in the United States. We present two sets of regression estimates: In unweighted regressions, all counties have equal weight; in weighted regressions, only counties similar to DC are assigned substantial weight while counties less similar to DC are given smaller weight.

We follow DLR in exploring the sensitivity of estimates to specification and include controls for metro area, state, and Census division (e.g., Northeast, Southwest), and time (measured in quarters). Implementing these controls in different combinations results in six primary specifications:

1. In the first specification, we include only controls for time so that we can adjust for changes in the federal minimum wage and not for any local employment market effects, which would be common to both a jurisdiction with an increased minimum wage and one without.
2. The second specification includes both controls for time and controls for metro area. By doing so, we can additionally adjust for metro areas that are similar to one another.
3. In the third specification, we include time controls and controls for the Census division of each county. Here, we are able to control for regional differences in minimum wages and employment.
4. In the fourth specification, we combine time and state controls together. By doing so, we can adjust for changes over time within states so that we can adjust for employment patterns within each state over time.
5. The fifth and sixth specifications use the DLR county-pairs approach. The fifth specification includes only controls for time and is therefore most comparable to the first specification.

6. In the final specification, we include controls for time, and separate controls for counties in order to better adjust for differences across the county pairs.

Within each specification, we also explore sensitivity to added controls, by adding a variable that measures population or total employment (both in logarithms). For average wages as the outcome, we also control in one set of regressions for average wages across all industries. Detailed regression results appear in the appendix, but we summarize the findings for employment in figure 9.

Regression-Based Estimates of the Effect of a Minimum Wage Increase on Food Service Employment
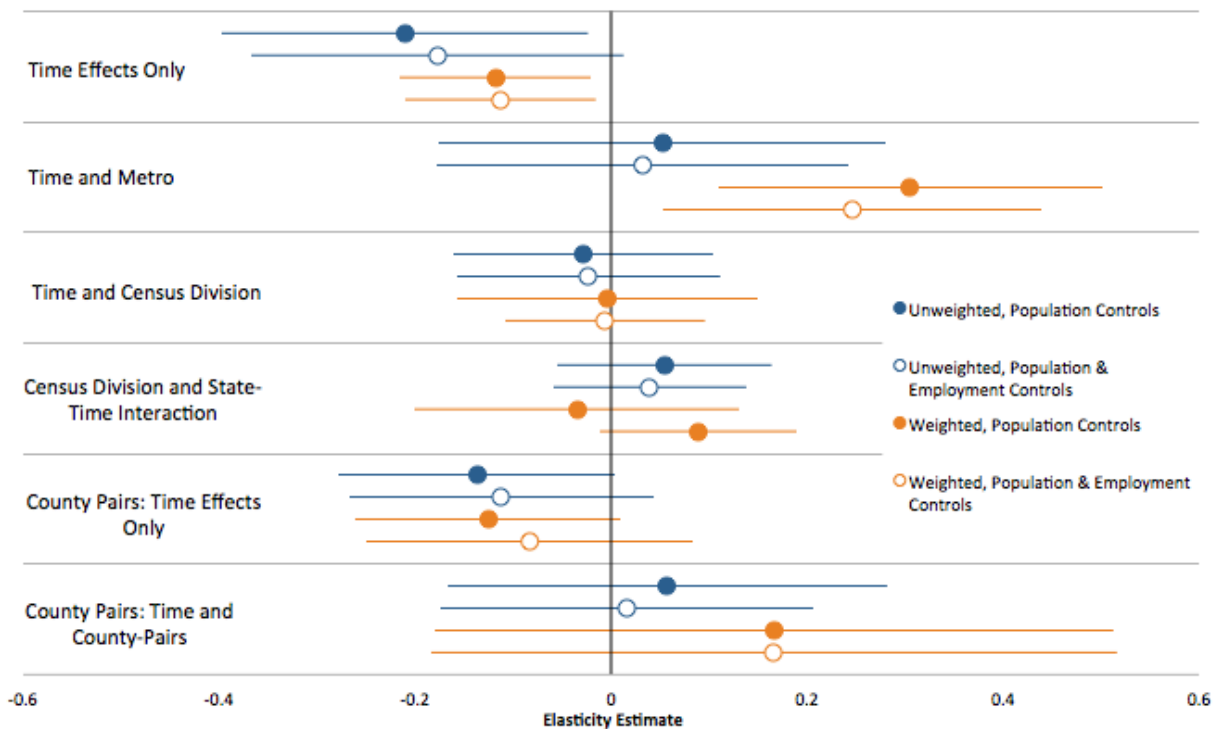
Only the regressions that control only for time period effects (specification #1) show negative impacts of increased minimum wages on employment. Regressions with controls for metro area, Census division, or interactions between the two uniformly show effects close to zero and that do not differ from zero at any conventional level of statistical significance. (In other words, the error bars around each point encompass zero; this is shown visually in figure 9 with the vertical line at zero.) The more theoretically appealing estimates, controlling for local labor market effect, trends, or county pair effects, show positive impacts of increased minimum wages on employment, though they do not differ from zero at any conventional level of statistical significance.

Further, the estimated effect of increased minimum wages on employment is uniformly less negative or more positive in weighted regressions than in the unweighted regressions. This finding suggests that the weighted regressions better capture the likely impacts of a minimum wage increase in DC. The unweighted regression results, by comparison, are designed to capture the experience in the *average* county affected by a minimum wage. In the end, however, none of the weighted and unweighted pairs of regression estimates differ from each other at conventional level of statistical significance.

Conclusions

Based on historical patterns for the DC metro area and an analysis of workers in the food service industry nationwide, we find little evidence that even a substantial increase in minimum wages in DC would result in lower employment. Our estimates of the relationship are imprecise, however, and we cannot rule out modest negative impacts, of perhaps half-a-percent drop in affected industry employment for each ten percent increase in the minimum wage. To date, minimum wage changes have operated in a very low range of the wage distribution so that very few people should be affected by the policy, even under the traditional theories that predict negative employment impacts. If minimum wages were instead raised above the 20th percentile of areawide wages, larger impacts could result.

Although there is little evidence to suggest an increase in the minimum wage would affect employment, there is a large amount of evidence that minimum wage changes over the 1990 to 2006 period had substantial effects on average weekly earnings. In many cases, an increase in average weekly wages will dramatically increase family incomes. Acs and colleagues (2014) analyze the impacts of increased earnings associated with increased DC minimum wages and find that the typical worker will take home about half of the annual earnings increase. That paper suggests that only a small proportion of affected workers lose a large proportion of their increased earnings to additional taxes or reduced benefits, and even those workers are plausibly better off with higher wages.

Extra net earnings for affected workers could result in part from higher productivity of workers who are better compensated, but there could also be unmeasured negative impacts on the owners of capital, as firms earn lower profits when labor costs are higher. The experience of San Francisco between 2004 and 2011 suggests that raising the minimum wage may contribute to a small rise in prices in the food service industry of about 2.8 percent (Reich, Jacobs, and Dietz 2014). We do not model losses of profits or increased prices, but focus exclusively on the employment and earnings effects of the new minimum wage policy in DC. Employment effects are plausibly negligibly small, and earnings effects are likely large and positive.

Notes

1. §900.4 stated that as of October 1, 1993, the minimum wage in the District of Columbia shall be the federal minimum hourly wage rate plus one dollar. See figure 2 for a graphical depiction of the change.

2. The data were made available from the Upjohn Institute on the HelpMeViz.com website (http://helpmeviz.com/2014/02/27/minimum-wage-elasticity-scatterplot/).

3. For the sample of all counties, the authors find that a 10 percent increase in the minimum wage is associated with a 2.17 percent increase in earnings and a -1.76 percent *decrease* in employment

4. Missouri Census Data Center (http://mcdc2.missouri.edu/websas/geocorr2k.html).

5. We include a cubic spline for log population density with knots at 5 and 9, so only counties of similarly high density as DC will be effectively included in weighted estimates.

6. The two food service industries we specifically examine are "Full Service Restaurants" (NAICS code 7221), and "Limited Service Eating Places" (NAICS code 7222).

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Appendix A
Detailed Regression Results

Detailed Employment Regression Results

Outcome is log employment in restaurants (NAICS 7221 and 7222)	Unweighted, Population Controls	Unweighted, Population and Employment Controls	Weighted, Population Controls	Weighted, Population and Employment Controls
Time Effects Only	-0.211*	-0.177	-0.118*	-0.113*
	(-2.21)	(-1.83)	(-2.38)	(-2.28)
Time and Metro Fixed Effects	0.0524	0.0321	0.305**	0.246*
	(0.45)	(0.30)	(3.05)	(2.50)
Time and Census Division	-0.0277	-0.0233	-0.00391	-0.00623
	(-0.41)	(-0.34)	(-0.05)	(-0.12)
Census Division and State-Time Interaction	0.0545	0.0392	-0.0346	0.0888
	(0.98)	(0.78)	(-0.41)	(1.73)
County Pairs: Time Effects Only	-0.137	-0.112	-0.126	-0.0831
	(-1.91)	(-1.42)	(-1.82)	(-0.98)
Time and County Pair Fixed Effects	0.0572	0.0165	0.166	0.166
	(0.50)	(0.17)	(0.94)	(0.93)

Notes: Each row is one of the six specifications described in the text; columns iterate over unweighted (representing national averages) and weighted (representing DC) regressions and alternative sets of controls.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ indicate p-value for a test that the effect is zero; stars indicate rejection of the null at the specified level with no adjustment for multiple hypothesis testing. t statistics in parentheses are robust to clustering at the state level.

Detailed Earnings Regression Results

Outcome is log average weekly wage earnings in restaurants (NAICS 7221 and 7222)	Unweighted, Population Controls	Unweighted, Population and Employment Controls	Weighted, Population Controls	Weighted, Population and Employment Controls
Time Effects Only	0.224***	0.217***	0.108*	0.0543
	(6.79)	(7.78)	(2.62)	(1.29)
Time and Metro Fixed Effects	0.153***	0.301	0.149***	0.284
	(3.73)	(1.36)	(3.92)	(1.39)
Time and Census Division	0.204***	0.195***	0.125*	0.0916
	(5.33)	(5.70)	(2.17)	(1.65)
Census Division and State-Time Interaction	0.219***	0.210***	-0.00236	-0.00355
	(5.88)	(6.11)	(-0.06)	(-0.10)
County Pairs: Time Effects Only	-4.26×10^{-10}***	0.221***	3.70×10^{-9}***	0.0767
	(-3.88)	(6.46)	(5.56)	(1.30)
Time and County Pair Fixed Effects	-3.93×10^{-10}***	0.189**	4.33×10^{-9}***	0.344
	(-4.90)	(3.12)	(4.67)	(1.05)

Notes: Each row is one of the six specifications described in the text; columns iterate over unweighted (representing national averages) and weighted (representing DC) regressions and alternative sets of controls.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ indicate p-value for a test that the effect is zero; stars indicate rejection of the null at the specified level with no adjustment for multiple hypothesis testing. t statistics in parentheses are robust to clustering at the state level. The average weekly wage earnings is the ratio of total restaurant payroll to total restaurant employment level in each county in each quarter.