The Local Aggregate Effects of Minimum Wage Increases

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Abstract

Using variation in minimum wages across cities and controlling for differences in business-cycle factors and long-run local economic trends, we find that following minimum wage increases, both prices and nominal spending rise modestly. These gains are larger for certain sub-categories of goods such as food away from home and in locations where low-wage workers are a larger share of employment. Further, minimum wage increases are associated with reduced total debt among households with low credit scores, higher auto debt, and increased access to credit.

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1 Introduction

The minimum wage is one of the most popular, contentious, and frequently adjusted economic policies in the United States. Since its introduction at the federal level in 1938, the national minimum wage has been raised 22 times. State-level minimum wage changes have occurred more frequently—especially recently—with 22 states increasing their minimum wages in 2019 alone (following 20 state-level increases in 2018). In addition, a number of cities have raised the minimum wage within their geographic boundaries in recent years. While a binding minimum wage raises the incentive for low-wage workers to work, it also reduces the incentive for employers to hire them. As a result, a binding minimum wage lowers employment in a competitive labor market, although it can raise employment in a monopsonistic labor market. A voluminous literature measures the microeconomic effects of the minimum wage on the outcomes of low-wage workers by, for example, comparing similar workers in the same labor market that are subject to different minimum wages (see, Card and Krueger, 1994), or comparing employment rates of different types of workers shortly after changes in minimum wages, controlling for city-level economic conditions. But an important outcome of minimum wage changes may be their influence on local economic conditions.

In this paper, we study local economies—defined as metropolitan statistical areas (MSA's or cities) that correspond to broad labor markets—and show how price levels, consumer spending, household debt, and credit access adjust over time following minimum wage hikes.

We first show that overall inflation increases modestly in the year of a minimum wage increase, and again by a similar amount in the subsequent year. This slow local-aggregate price adjustment comes from rapid adjustment in prices for food away from home, which is typically produced using a larger share of low-wage workers, and slower and smaller adjustment in the prices for goods produced using fewer local low-wage workers.

Second, we find increases in nominal consumption expenditures that are more broad-based following a rise in the minimum wage, with the largest effect for food spending. Our estimates imply that real spending on food rises when minimum wages increase, which implies that the income effects from minimum wage gains for low-wage workers and any local general equilibrium effects that raise local demand outpace the substitution effects from the higher prices.

Finally, consistent with a relaxation of payment-to-income constraints on borrowing when the minimum wage increases, credit appears to become easier to obtain, as measured by the number of open accounts relative to credit inquiries. Also, while there is little change in debt for the average individual, debt levels for subprime individuals decrease when the minimum wage rises, suggesting that the effects of debt repayment dominate those of new borrowing for bigger ticket items for this group. We further show that auto loans increase in response to an increase in the minimum wage, with larger effects among likely constrained borrowers (subprime and young).

We reach these conclusions by using the variation in minimum wages across states and cities (where applicable) and over time. We measure the responses of growth rates in local economic outcomes the year during and one year after a change in the minimum wage. Many previous studies focused on the more immediate minimum wage effects over a few months, which measure well the direct impact of the increase in the cost of low-wage labor, but omit medium-term responses to the prices of intermediate inputs (from other firms) as the local economy converges to a new equilibrium. On the other hand, we do not focus purely on the long-run relationship between minimum wages and local outcomes because the long-run propensity of a state (city) to have a high minimum wage seems likely to be related to other policies or the standard of living in that state (city). For instance, a state (city) with a high long-run growth rate may raise its minimum wage more than a low-growth state (city) due to increases in the relative cost of living. To avoid such bias, we condition our analysis on the long-run growth rate in each locality by including location fixed effects and conducting our analysis in growth rates (we also include aggregate time effects). As a final control for the possibility that minimum wage changes are to some extent predicated on transient local economic conditions, we incorporate a Bartik-style (exogenous) measure of local employment growth that, by construction, is orthogonal to changes in the local minimum wage and other city-specific factors.

Quantitatively, we find that an increase in the minimum wage is associated with a modest rise in city-level prices: a 10 percent increase in the minimum wage increases the local-aggregate CPI by 0.14 percentage points in the year of the increase. This city-level inflation effect is persistent, with a cumulative price gain—taking into account the lagged minimum wage change—of about 25 basis points for a 10 percent hike in the minimum wage.

These overall price increases are larger and more significant when we account for differences in the share of low-wage workers across locations. Higher minimum wages are likely associated with greater cost increases in locations with more low-wage workers. Indeed, following a 10 percent increase in the minimum wage, we find that overall CPI inflation is cumulatively 0.08 percentage points higher for each one-standard deviation higher share of low-wage workers. The price change is larger, and more rapid, for prices of food away from home, a consumption good that is typically produced using a greater share of local, low-wage workers. Services prices—another sector dominated by low-wage workers—also increase more noticeably following a minimum wage increase when we account for differences in the low-wage worker share across locations.

Second, a 10 percent increase in the minimum wage is followed by 0.22 percentage point increase in nominal consumer spending, presumably as a result of greater income and perhaps employment, but also through relative prices and other channels as the local economy adjusts to the higher minimum wage. For food at home and away from home, we find that when the minimum wage rises, nominal spending increases more than the price gains, suggesting that, on net, consumers raise the quantity of food that they consume at and away from home. For durable goods, we find that cumulative nominal spending increases roughly in line with prices when the minimum wage rises—a response that is not statistically significant. However, nominal and real durable goods expenditure growth exhibits a large and statistically significant response, at least contemporaneously, to a change in the minimum wage when we control for differences in the share of low-wage workers across locations. While the real expenditure growth increase does not persist—in the second year durable goods inflation rises while spending does not—this durable consumption response to a change in the minimum wage is broadly consistent with minimum wage increases relaxing households' borrowing constraints for big-ticket items.

Finally, we provide evidence consistent with improved credit availability for low-income workers when minimum wages rise. Credit bureau data from the Federal Reserve Bank of New York Consumer Credit Panel provided by Equifax (CCP) show higher success rates for credit applications following an increase in the minimum wage—particularly for young and subprime borrowers.[1] There is also a sizeable increase in auto loans following a minimum wage change, which points towards a demand-driven explanation for the change in durable expenditures along with the lagged gain in durable good prices that we document. However, among individuals with low credit scores, minimum wage hikes reduce the stock of debt outstanding.

Our baseline estimate that inflation rises 0.24 percentage points cumulatively in response to a 10 percent increase in minimum wages is consistent with early work by Wolff and Nadiri (1981), who find that a 10-to-25 percent increase in the minimum wage raises

[1] Dettling and Hsu (2017) further document more direct-mail credit card offers for low-income individuals following minimum wage increases.

prices by 0.3 to 0.4 percentage points, a relatively modest effect. Lemos (2004) finds that minimum wage increases in Brazil had similarly small price effects.[2] These results are also related to the (partial-equilibrium) analysis in Aaronson (2001)[3] and Card and Krueger (1994) of relative local restaurant prices in the months following an increase in the minimum wage.

We focus on the price, spending, debt, and credit supply effects of minimum wage changes and not the employment effects because the latter has been extensively researched in the literature. State-level panel data analyses of the employment effects of the minimum wage are sensitive to specification, with estimates of the employment decline for the most affected groups (teenage employees or low-wage workers) ranging from 0 to 0.19 percent for a 10 percent increase in the minimum wage.[4] Our results on the importance of the share of low-wage workers—across cities and in goods production—are consistent with the existing literature that focuses on the employment effects of minimum wage changes for teenage and/or fast-food workers or restaurant-industry price changes (see, for example, Aaronson, French, and MacDonald, 2008; Card and Krueger, 1994; Basker and Kahn, 2016). Similarly, Aaronson, Agarwal, and French (2012) examine the changes in household income that occur in response to minimum wage changes for households with minimum-wage workers compared to households without minimum-wage workers. MaCurdy (2015) shows that increases in the national minimum wage raise consumer prices across goods in a way that is more regressive than a typical state-level sales tax

[2]Lemos (2008) emphasized the limited work at the time on the relationship between minimum wage changes and consumer prices. However, this is changing. Ganapati and Weaver (2017), Leung (2018), MacDonald and Nilsson (2016), and Renkin, Montialoux, and Siegenthaler (2017) all examine the link between minimum wages and prices.

[3]Aaronson (2001) examines the relationship between minimum wage changes and restaurant-price inflation *relative* to CPI inflation, not the local-aggregate outcomes of minimum wage changes.

[4]For recent examples see Neumark, Salas, and Wascher (2014), Dube, Lester, and Reich (2016), and Cengiz et al. (Forthcoming). In addition, Totty (2017) provides a nice review of the literature and the current minimum wage and employment debate (see Table 1). Not focusing on specific groups like teenagers, we find negligible effects of minimum wages on total employment or labor income in our city-level specifications.

increase, and that this effect is large enough that it can completely neutralize the direct benefits for the working poor. Both our focus on local-aggregate outcomes and our results on household debt and credit access complement the existing literature by showing more broadly how the local economy responds to minimum wage changes.[5]

The remainder of the paper proceeds as follows. Section 2 discusses minimum wage changes in the United States along with our other data, Section 3 highlights our empirical approach, and Section 4 presents our results. Section 5 concludes.

2 Data

We conduct our analysis at the city (MSA) level—consistent with the locations and boundaries defined by BLS for their MSA-based CPI indices (CPI MSAs)—because this level of geography captures a local labor market. Going forward we will refer interchangeably to these areas as "cities" or "MSAs." Our sample period runs from 1999 through 2017 (see Secton 2.5) and includes, especially recently, substantial variation in minimum wages across locations. In addition, some data, like minimum wages, occur naturally at the state level while other data are constructed (e.g. consumption expenditures) at the state level. Section 2.4 describes how we move from state-level data to city-level data.

2.1 Minimum Wage Changes in the United States

Since its inception in 1938 as part of the Fair Labor Standards Act, policymakers at the federal, state, and local levels have debated the appropriate level of the minimum wage and often legislated changes. While minimum wages at the federal level (currently $7.25 per hour, and unchanged since 2009) serve as a floor for workers' wages (and the minimum

[5]Many researchers are studying the relationship between minimum wages and outcomes other than employment. For example, there is a nascent literature on the effects of minimum wages on health (see Meltzer and Chen, 2011; Horn, Maclean, and Strain, 2016; Wehby, Dave, and Kaestner, 2016; Lenhart, 2017a,b).

wage in some states), many states set higher local minimum wages and recently there has been a push in some states toward a $15 per hour minimum ("living") wage.[6] In addition, some cities such as Seattle have city-specific minimum wages that supersede state-level minimum wages. Indeed, to date, 41 localities (cities and metropolitan counties) have minimum wages above the corresponding state minimum wage, of which roughly 30 are part of our CPI-MSA sample. In calculating minimum wages, we also take into account these locality-specific minimum wages. However, our results are very similar if we do not include local-level minimum wages because most are very recent local policy changes.

In 2017, the latest year in our sample period, minimum wages ranged from $7.25 per hour in states that followed the federal minimum wage like Pennsylvania, Texas, and Utah to $12.5 per hour in the District of Columbia. Locality-based minimum wages ranged from $8.8 per hour in Albuquerque, New Mexico to $14 per hour in San Francisco, California. In addition, while minimum wage changes are infrequent—especially at the federal level—they have increased in frequency in recent years. In 2017, 22 states raised their minimum wages, after 17 states increased their minimum wage during 2016.[7] As a result, there is substantial variation in minimum wages across states and localities as well as over time.

Figure 1 demonstrates how the federal minimum wage acts as a floor for our MSA-level minimum wage data. In particular, it plots the federal minimum wage (red line), the average minimum wage across the MSAs in our sample (black line), as well as the range of minimum wages across these MSAs in each year (blue boxes show the interquartile range). Figure 1 also shows that the dispersion of minimum wages across locations has increased somewhat over time.

[6] Reich, Allegretto, and Montialoux (2017) examine the potential effects of raising California's minimum wage to $15 per hour by 2023.

[7] Minimum wage changes in a number of states (7 in 2017) were very small, automatic increases tied to the cost-of-living. For more details on the most recent minimum wage changes see http://www.ncsl.org/research/labor-and-employment/state-minimum-wage-chart.aspx.

Historical data on minimum wages comes from four primary sources: the Tax Policy Center (TPC), the U.S. Department of Labor (U.S. DOL), various state departments of labor (state DOL), and local government websites for city- or county-specific minimum wages. Our final minimum wage dataset combines information from all four sources, and when possible, it accounts for the actual dates when the minimum wage changes occurred. Since our final unit of analysis is a year, we take the average annual minimum wage in locations that have more than one minimum wage in a year.[8] We further focus on the *effective* minimum wage in each city (hereafter minimum wage), which is the maximum between the posted (state, city, or county) minimum wage and the federal minimum wage in each year.

2.2 Additional Data Sources

The BLS publishes CPI data for 28 metropolitan areas for various subcategories of consumer spending at various frequencies (monthly, bimonthly, semiannual, and annual).[9] For consistency across locations and over time, we convert all data to an annual frequency by taking the average of the higher-frequency data where applicable. We calculate inflation as the percent change in the annualized CPI data. In addition, while the data for many cities start in 1970, a few locations have data starting more recently, such as Phoenix, AZ (2003). For our inflation analysis, we construct an unbalanced panel of the available price data.

We measure nominal personal consumption expenditures (PCE) based on the state-level series produced by the Bureau of Economic Analysis (BEA). These state-level data are estimated, like all BEA data, but these series rely more heavily on interpolation

[8]Because most minimum wage changes occur at the start of the year, alternative approaches, such as taking the first or last minimum wage value of the year by location, yield very similar results.

[9]The BLS' CPI-MSA boundaries do not necessarily match the (more common) boundaries used by the Census Bureau for all locations. The Appendix contains a full list of these BLS metropolitan areas.

than do BEA data for the aggregate economy. In particular, most components of state-level PCE are based on annual state-level spending estimates that are then adjusted to scale to the national level as well as for out-of-state spending by residents and in-state spending by non-residents. Roughly sixty percent of these annual estimates are based on the Economic Census in years with an Economic Census while the remaining categories (primarily housing, utilities, higher education, foreign travel, and financial services and insurance) are calculated from (higher-frequency) state-level data on quantities and prices. These annual measures are then interpolated and extrapolated between economic censuses using the growth rate of wages from the Quarterly Census of Employment and Wages (QCEW) for the industries that sell the relevant goods and services. The BEA finds the interpolation to be quite accurate in the sense that the extrapolated series from one census matches well the level of the series from the subsequent census.[10]

We are also interested in the relationship between minimum wage changes and real expenditures in a city. However, the BEA only produces state-level implicit price deflators for GDP.[11] Since we are conducting our analysis at the city level, we use the CPI to construct approximate real consumption data for spending categories where there is reasonable overlap between the nominal PCE data and the price data. In particular, the CPI and PCE coverage for food away, food at home, and durables are reasonably similar. Real consumption growth is the difference between annual nominal expenditure growth and annual inflation for these categories. We also combine total CPI data with nominal total PCE data to study total real consumption spending despite the fact that the treatment of some goods and services, notably housing and health care, are quite

[10]See Awuku-Budu et al. (2016) and Lenze (2018). Because the Economic Census is infrequent, our longer-term estimates of consumption responses to minimum wage changes may be more accurate than our shorter-term responses. With our shorter-term estimates, one might be concerned that, to the extent that employment-based interpolation does not accurately measure local retail activity, our results may partly measure the effect of the minimum wage on the total wage bill.

[11]When the BEA first introduced state-level PCE (in 2014), they viewed producing PCE price deflators as a longer-term (lower) priority (see, Awuku-Budu et al., 2013).

different between the NIPA and CPI. Thus, these constructed real spending data are reasonable (albeit imperfect) for some categories, and not as good for others.[12]

We also use credit bureau data from the CCP to analyze the relationship between minimum wages and individuals' credit access and debt holdings. The CCP is a longitudinal nationally representative 5 percent random sample of individuals with credit records in the United States. The data are available quarterly and include information on most aspects of individuals' credit and debt, including credit scores as well as balances on credit cards, auto loans, student debt, and mortgages. Importantly, the dataset also includes information on the number of credit inquiries (related to credit applications) and the number of open accounts for an individual in a given period, information which allows us to track whether individuals are successful in their credit applications.

Finally, minimum wage changes are likely to be more relevant and binding in locations with a larger share of low-wage workers. Therefore, we calculate the share of workers in each state that have hourly earnings (or effective hourly earnings if they are salaried) that are within 110 percent or less of the minimum wage in that state based on wage data from the March Current Population Survey (CPS) annual supplement. We convert these state-level measures to city-level data using the weighting approach discussed in Section 2.4.

2.3 Local Employment Growth

We construct a Bartik-style measure of local employment growth (hereafter BEG) to control for local business cycle conditions. The Bartik approach captures shocks to local demand based on changes in industry-level employment at the national level and the shares of employment by industry in a given location (see Bartik, 1991, for more

[12]The CPI has excellent price data, so the approximation underlying this approach comes from assuming that the weights used to aggregate price changes across different subcategories of goods and services are the same in the PCE data as in the CPI data.

details). Employment data by state and industry come from the BEA, and we focus on the largest industries (2-digit NAICS codes) for our analysis. To ensure that local changes in employment—especially in large states—do not unduly influence the measure of national employment growth, we exclude employment growth in state i from the measure of national employment growth used to calculate the Bartik growth rate for state i.[13] Finally, for MSAs that span multiple states we convert the state-level BEG data to city-level data using the population-based weighting approach described next.

2.4 Reconciling Different Data Geographies

As noted, we conduct our analysis at the city (MSA) level based on the geographic boundaries defined by the BLS for their MSA-level CPI data. Whereas previous research focuses on state-level (often cross-border) analysis, we focus on cities because we believe they best define a local market and we are interested in local aggregate outcomes of changes in the minimum wage. Indeed, markets for labor and a substantial fraction of consumption are defined by commuting distances, and are thus better measured by MSA-level data than state-level data.

Since a number of the BLS' CPI-MSA locations, like the New York and Philadelphia MSAs, contain suburbs that extend across state lines, we must appropriately convert state-level minimum wage and other information to city-level data. To do so, we first determine the share of the MSA (city) population belonging to each state in each location using Census population data and information from the BLS on the counties in each CPI MSA. We then population weight the state-level data to generate boundary-consistent city-level data. We follow this approach to construct city-level consumption, low-wage worker shares, and BEG. Our approach is quite similar for constructing city-level minimum wages, however we incorporate actual city-level minimum wage information for

[13] This approach has been used by Paciorek (2013) and others.

the counties within the CPI MSA boundaries to which the city minimum wage applies before aggregating the data based on population shares. Alternative aggregation approaches, such as using the minimum or maximum value of a given measure among the relevant locations (states or counties) within each city's boundaries, yield similar results. Also, since the CCP data are at the individual-level and contain county-level geographic identifiers we aggregate them up to the city-level directly.

2.5 Sample Period and Relevant Summary Statistics

Our analysis focuses on the 28 CPI MSAs for which the BLS publishes city-level price data. These locations cover roughly half of the U.S. population and most of the population living in or near cities.[14]

Our baseline sample period runs from 1999 through 2017 and is determined by the availability of the PCE data (starting in 1997 and available through 2017), NAICS industry employment data (growth rates starting in 1999), county-level population data (available through 2017), and household debt (CCP) data (available starting in 1999). The Appendix includes estimates of the effect of minimum wage changes on inflation using all the available CPI and minimum wage data (1983–2018).[15]

Figure 2 shows the number of CPI MSAs with a minimum wage change in a given year. Not surprisingly, most minimum wage changes occur in years when the federal minimum wage increases. However, many states and (more recently) cities adjust their minimum wage at other times, thus generating variation in the number of CPI MSAs with a minimum wage change both within and across years. There are 228 specific changes in the minimum wage across 35 states *excluding* changes in the federal minimum wage

[14]According to a 2015 Census Bureau report, 62.7 percent of the U.S. population lives in a city. See https://www.census.gov/newsroom/press-releases/2015/cb15-33.html.

[15]These estimates do not include controls for local economic conditions since the BEG data are only available starting in 1999.

during our sample period.[16]

The average change in the minimum wage in our sample is 5.1 percent (conditional on a change occurring) with a standard deviation of 5.1 percent. Figure 2 further highlights that state- and city/county-driven changes in the minimum wage, and hence fluctuations in minimum wages across CPI MSAs, have become more frequent recently. All of this variation across locations helps us identify the relationship between minimum wage changes and inflation, consumption growth, and household debt growth.

Figure 3 shows data on the share of low-wage workers by city over time (left panel) as well as the average low-wage worker share by state (right panel). There is substantial variation in the share of low-wage workers both across states (on average and within a year) and over time. Across states the shares ranging from around 10 percent in Nevada and Virginia to closer to 20 percent in states like Mississippi and Montana.

Finally, there is also reasonable variation in inflation, nominal consumption growth, and debt growth across our cities. Total CPI inflation ranges from –2.6 percent to 6.0 percent, with a mean of 2.2 percent and a standard deviation of 1.3 percent, whereas total nominal consumption growth ranges from –3.1 percent to 10.2 percent, with a mean of 4.4 percent and a standard deviation of 2.1 percent. Total debt growth ranges from –10.1 percent to 120 percent with a mean of 6.1 percent and a standard deviation of 11.6 percent.[17] Tables A.1–A.4 in the Appendix provide additional summary statistics for the relevant components of inflation, consumption, debt as well as minimum wage changes.

[16]Including changes in the federal minimum wage in 2007, 2008, and 2009, there are 304 minimum wage changes across all 50 states and the District of Columbia. The largest increase was about 39 percent in Pennsylvania in 2007, while the minimum wage declined a touch in Colorado in 2010.

[17]The maximum value for total debt growth (and auto loan growth), which is a bit of an outlier, is for Chicago in 2000. We have verified our results are robust to excluding this observation or the year 2000 entirely from the regressions using the CCP data.

3 Empirical Framework

We examine the relationship between inflation (or PCE growth or changes in debt) and minimum wage changes by estimating the following reduced-form relationship:

$$\Delta y_{i,t}^{k} = \alpha_i + \nu_t + \sum_{j=-J_1}^{J_2} \beta(j) \Delta w_{i,t-j} + \eta\, x_{i,t} + e_{i,t}. \tag{1}$$

Here Δy_{it}^{k} is the (annualized) percent change in CPI prices (PCE growth or debt growth) for a given price (consumption or debt) category k (for example, food away from home) in city i between time t and $t-1$; $\Delta w_{i,t}$ is the percent change in the minimum wage (MWPC) for city i between time t and $t-1$; α_i captures time-invariant differences across cities, including differences in long-run inflation or growth by location; v_t is a time fixed effect that captures macroeconomic trends across all CPI MSAs; x_{it} is a measure of local economic conditions; and J_2 and J_1 denote the number of lags and leads, respectively, of the MWPC.

As noted in the introduction, by using annual data and looking at responses over a couple of years, our specification strikes a balance between measuring only the very immediate response to a change in the minimum wage and estimating a response that is biased by possible correlations between other characteristics of a city and its average relative minimum wage. Indeed, prices may take a couple of years to adjust within a city, because some sectors use other local goods as inputs, some may have significant strategic complementarities in price setting, and others might experience investment, entry, or exit when minimum wages rise.

In our empirical specification, the locality-specific fixed effects attempt to control for long-run differences across locations, such as their general size of government, generosity of social insurance, or other highly-persistent factors that might affect economic outcomes and also correlate with the minimum wage. We do not, however, include as control variables any economic outcomes, such as overall inflation, that are possibly affected by the minimum wage, and so would be endogenous to the local aggregate impact of the minimum wage increase. Including such variables is appropriate for studies estimating individual-level or partial-equilibrium, high-frequency effects, as in Aaronson (2001).

We do however include exogenous controls for local economic conditions, denoted by x_{it} in equation (1), to capture time-varying, city-specific factors that might affect our outcomes of interest, but are not caused by the change in the minimum wage. These controls not only absorb unexplained variation and increase precision, but also account for possible correlations or even reverse causation, as local economic conditions may spur changes in the minimum wage. We use BEG to capture local labor demand, since it is exogenous with respect to changes in the local minimum wage.[18] With BEG as a control, the estimated minimum wage effect, $\sum_{j=-J_1}^{J_2} \beta(j)$, represents the pass-through of minimum wage changes to inflation, consumption growth, debt growth, or credit access that is uncorrelated with changes in local economic conditions driven by the industrial composition of the location and the national patterns of employment growth by industry. Ultimately, our choice of control for local economic conditions has little effect on our minimum wage coefficient estimates; for example, including the local employment-to-population ratio or not having any controls for local conditions yield very similar results.[19]

Overall, the conditional correlation between minimum wage changes and local aggregate outcomes represents the causal effect of minimum wages if the controls we employ in estimating equation (1) capture any reverse causation or endogeneity in changes in the minimum wage. Thus, the causal interpretation of our results requires more assumptions

[18]The industry share of employment within a state is relatively fixed over time, and national employment growth by industry should be independent of a given's state's minimum wage. Still, national employment growth data may be less exogenous in years when a large number of states change their minimum wage. However, our results are very similar if we exclude years from our sample when twelve or more states change their minimum wages.

[19]In the Appendix, we discuss alternative approaches to control for local economic conditions, including unobserved local factors that might impact our estimated minimum wage coefficients. These approaches also yield very similar results.

than existing individual-level studies which can and do make use of variation that more closely approximates that of a true experiment.

We estimate equation (1) from 1999 to 2017 using one lag and no leads (J_2=1, J_1=0) of the MWPC. The lag helps determine the persistence of any effect. We considered including one lead (J_1=1) to capture any anticipatory relationship between minimum wage changes and local economic outcomes since minimum wage changes tend to be announced well in advance of their effective date, especially recently. However, there is limited empirical evidence for an anticipatory relationship and thus our baseline estimates include a lag but no leads. We are interested in both the initial effect of the change in the minimum wage, $\beta(0)$, and the total effect, $\sum_{j=0}^{1} \beta(j)$.[20] (The Appendix reports estimates where we include one lead and one lag (J_2=1, J_1=1)—see Tables A.5–A.7).

It is important to note that despite our controls, if minimum wage increases were only a function of economic conditions, then it would be impossible to identify the effect of minimum wages on economic outcomes because all the variation in minimum wages would represent reverse causation. Thus, we are particularly concerned about minimum wage increases indexed to annual changes in the cost-of-living. Such indexing, however, is only a very recent and limited phenomenon. Only 8 states raised their minimum wage due to such indexation in 2017: Alaska, Florida, Minnesota, Missouri, Montana, New Jersey, Ohio, and South Dakota.[21] Minimum wage hikes due to inflation indexation have also been very small compared to changes in states that do not index their minimum wages. Also, unlike in Brazil where minimum wage changes are solely determined at the national level, and historically have been tied to large fluctuations in aggregate inflation, we have both cross-sectional and time-series variation in minimum wage changes. This variation helps us, among other things, to identify the effect of minimum wages on prices,

[20]Our empirical framework is most similar to that in Lemos (2004).

[21]In the past Arizona, Colorado, Nevada, and Washington State also indexed their minimum wage changes to inflation.

since the vast majority of the changes in minimum wages at the state, city or county level are legislated and not enacted in response to local inflationary pressures.

Finally, in some specifications we allow for the relationship between minimum wages and economic outcomes to vary with the relative number of likely minimum wage workers in a local area. To do this, we include an interaction between the MWPC and the share of low-wage workers in each city.[22] This approach tests whether our observed economic outcomes are differentially larger in locations with a greater share of low-wage workers. Since the share of such workers in a location is arguably driven by long-run factors such as the composition of a city's industrial base, consistent identification of this heterogeneity requires weaker assumptions than are required to observe how local outcomes respond to minimum wage changes.

4 Results

4.1 Minimum Wage Changes and Inflation

Our baseline inflation results (Table 1) show that minimum wage changes have the most substantial and precisely-estimated effect on the price of food away from home.[23] With a 10 percent increase in the minimum wage, food away from home inflation is higher by about 0.4 percentage points over the first year (column 8). Overall, food away from home inflation rises by roughly 0.5 percentage point taking into account lagged minimum wage changes $(t-1)$.[24] A particularly strong inflation response for food away is consistent

[22]We calculate the share of minimum-wage workers based on the minimum wage that prevailed as of time $t-1$ given the timing conventions in equation (1).

[23]The Bureau of Labor Statistics defines food away from home as all food purchases at restaurants, concession stands, vending machines, fast food establishments and other similar food purveyors, while food at home refers to expenditures at grocery stores excluding nonfood items. For more details see: https://www.bls.gov/cex/csxgloss.htm.

[24]The "two-year effect" memo line in the result tables includes the contemporaneous (t) and lagged $(t-1)$ minimum wage estimates to measure the cumulative response of a given outcome to a minimum wage change (the p-values for these estimates are in the square brackets).

with restaurants typically employing a large number of minimum-wage workers, and facing relatively greater cost pressures when minimum wages rise.

The estimates in Table 1 further show that a 10 percent increase in the minimum wage is associated with an overall (all items) inflation rate that is 14 basis points higher relative to the preceding year (p-value 0.104). This effect is small and only borderline significant, especially given that a 10 percent minimum wage increase is double the average MWPC in our sample. The cumulative, (all items) price effect is larger, but it is still imprecisely estimated. Core inflation, which excludes food and energy prices, and all items less energy inflation exhibit similar initial and cumulative responses to a minimum wage change.

The results also highlight differences in the speed with which prices adjust following a change in the minimum wage. The majority of the increase in food away inflation occurs in the first year, with a smaller gain occurring in the year after the change (lagged effect), suggesting that minimum wage changes are associated with a fast and largely transitory effect on food away inflation, and a permanent effect on food away prices. The increase in inflation following an increase in the minimum wage is more uniform over time outside of the food sector, with all-items, all-items excluding energy, and core CPI inflation all rising about the same amount in the year following the minimum wage change as they do contemporaneously—results driven by a strong lagged response of durable goods prices to the minimum wage change. Still, the cumulative responses of these broader inflation measures are not significant at conventional levels although the responses are larger and more precisely estimated in cities with a greater share of low-wage workers, as we discuss in Section 4.3. Owing to the strong lagged response, durable goods inflation is also cumulatively, but insignificantly higher, due perhaps to increased demand, as we discuss in section 4.2.

In addition, the estimates for BEG in Table 1 suggest that higher employment growth is associated with greater local inflation. This effect is quite large for durable goods. The response of inflation to BEG growth is also much larger than its response to minimum wage changes.[25] However, as we noted earlier, controlling for local economic conditions using BEG or other measures, has little effect on our estimated minimum wage effects (see Table A.8 in the Appendix).

Implied Pass-Through of Minimum Wages to Consumer Prices

The cumulative, relatively large gains in food away inflation and durable goods inflation in response to an increase in the minimum wage imply a relatively significant pass-through of labor costs to prices in these sectors. Indeed, the magnitude of our price effects are larger than can likely be attributed to the share of minimum wage workers' salaries in firms' overall marginal costs, consistent with minimum wage hikes leading to increases in input prices and other local aggregate effects.

If prices (in a sector or industry) increase by 3 percent for a given change in the minimum wage, but firms' marginal costs (in that sector) increase by 4 percent, then there is less than full pass-through of higher labor costs. However, embedded in this calculation is an assumption regarding the share of low-wage workers' earnings in firms' overall costs. If the implied share of (low-wage worker) labor costs is unreasonably large given the observed increase in prices following a minimum wage hike, then there are likely other local aggregate outcomes associated with higher minimum wages that also affect the pass-through. Ultimately, the degree of pass-through depends on the response of firms' labor costs (payroll) and production inputs (intermediate good prices) to minimum wage gains. The share of labor costs and intermediate goods prices in firms' overall marginal costs also matters.[26]

[25] The estimated BEG effects are substantially larger than the employment growth effect estimates obtained using actual employment growth in a given city (not shown). Some of this difference is likely due to attenuation bias since actual employment growth is likely endogenous. The BEG variable also controls for something slightly different than actual employment growth, so we would not expect the coefficient to be the same even if there was no endogeneity.

[26] Firms may respond to minimum wage changes by adjusting employment or employees hours. However, Basker and Kahn (2016) consider that managers in the fast-food sector may change employment

To further investigate the extent to which minimum wage increases are passed through to prices we use data from the Census Bureau's County Business Patterns (CBP) database on (NAICS-based) industry-level payrolls to calculate the effect of minimum wages on firms' labor costs by sector. However, we do not observe the relationship between minimum wages and firms' intermediate good costs, nor the labor share of firms' overall costs (by sector).[27] Instead, we judge the price pass-through based on our observed price increases, data on labor cost increases, and whether the implied labor share is reasonable.

Using the CBP database, we estimate that payroll growth in the food away sector increases about 0.5 percentage points[28] following a 10 percent increase in the minimum wage.[29] Basker and Kahn (2016) determine that payroll costs account for about half of firms' marginal costs in the fast-food sector. If we assume that labor costs account for half of firms' marginal costs more generally in the food away from home sector, then the cumulative inflation increase we observe (0.5 percentage points for a 10 percent minimum wage hike) represents more than a full pass-through of the minimum wage change. This outsized implied pass-through of labor costs suggests that firms in the food away sector also face rising product costs and other increased expenses when minimum wages increase. If instead we focus on narrower definitions of food away for our payroll cost estimates, such as "full service restaurants" or "limited service restaurants," the average payroll growth increase for 10 percent rise in the minimum wage is about 1.0 percentage point.

levels in response to minimum wage hikes, and find such potential employment effects to be negligible.

[27] It is possible to estimate the labor share for certain years and industries, but obtaining estimates of the cost share for intermediate goods is difficult.

[28] This estimate is based on using payroll growth for "Food Services and Drinking Places" (NAICS 722). Unfortunately, the NAICS industry categories do not line up exactly with the food away from home category in the CPI, so we have to choose a NAICS industry (or industries) that is (are) reasonably close. If we instead use "Full Service Restaurants" (NAICS 7221) or "Limited Service Restaurants" (NAICS 7222), the payroll effects are larger.

[29] We estimate payroll effects using a specification similar to equation (1), but with payroll growth as the dependent variable and with only the contemporaneous minimum wage change (the other controls are unchanged). This approach is similar to the one in Basker and Kahn (2016), but we use growth rates instead of levels (of payrolls and the minimum wage) to be more consistent with our empirical specification. These estimates are not shown, but they are available upon request.

In this case, our results would imply roughly full pass-through of labor costs, ignoring any other changes in production costs associated with the minimum wage hike.

We further find that payroll growth at motor vehicle and parts dealers—which account for a large share of consumer durable purchases—rises about 0.6 percentage points for a 10 percent increase in the minimum wage, whereas our baseline results show that durable goods inflation increases 0.3 percentage points cumulatively for the same minimum wage change. Full pass-through of this labor cost increase, assuming no other cost changes at motor vehicle and parts dealers, would imply a labor share of marginal costs of about 50 percent. This share is unrealistically high since durable goods firms likely employ less low-wage workers than firms in the food service industry. Most likely, durable goods firms face other costs associated with minimum wage increases and have a low-wage labor cost share that is less than 50 percent. A lower labor share along with additional costs associated with minimum wages would imply less than full pass-through of minimum wage increases to consumer prices.

Overall, our results suggest large pass-through effects of minimum wage hikes to consumer prices based on labor cost changes *alone*. Existing literature on the pass through of minimum wages to prices is mixed and fairly limited. Basker and Kahn (2016) find full pass-through of minimum wage changes to prices in the fast-food sector (limited-service restaurants; NAICS 7222). In addition, using Nielsen retail scanner data Leung (2018) finds a large pass-through of minimum wages to grocery store prices, but not drugstore or general merchandise store prices. In contrast, Ganapati and Weaver (2017) find much more limited pass-through of minimum wages to grocery store and wholesale club prices.[30]

[30] Unlike others in the literature, Ganapati and Weaver (2017) find little evidence of minimum wages affecting labor costs, even in the grocery store sector.

4.2 Minimum Wage Changes and Consumption

Turning to the relationship between minimum wage hikes and the local aggregate response of household consumption, we find a statistically significant increase in nominal spending for overall PCE as well as multiple subcategories when minimum wages rise. Like with prices, the biggest gain following a minimum wage increase is for food away spending. In addition, while total consumption rises roughly in line with total prices, we further find that real expenditures on food rise—especially food away from home. That is, households appear to increase the *quantity* of food they consume when minimum wages and food prices rise—an effect that is larger when we control for the share of low-wage workers in a city.[31] While it may seem counterintuitive that food quantities rise when food prices rise, as we discuss further below, our results are consistent with income effects outweighing substitution effects as earnings gains from minimum wage increases accrue mainly to low-wage workers who tend to have a higher propensity to consume food out of income gains.

Table 2 reports nominal consumption results. Total PCE expenditures rise roughly 0.2 percentage points on impact with a 10 percent increase in the minimum wage. In comparison, nominal food away consumption growth rises by nearly 0.9 percentage points (on impact and cumulatively), and food at home spending growth rises about half as much cumulatively—a gain that is also statistically significant. We further observe an increase in nondurable goods consumption growth, consistent with the strong gains in food spending. Services spending also edges up a precisely estimated 0.2 percentage points initially with a 10 percent gain in the minimum wage, while durable goods spending rises somewhat more than services initially and cumulatively but neither gain is statistically significant. The total response of durable goods consumption to minimum

[31] We interpret *quantity* in a broad sense. The increase in real consumption could also indicate a change in the composition of low-wage workers' consumption basket, towards higher-quality, more expensive products.

wage changes is larger and more precisely estimated if we allow for an anticipatory response to the minimum wage change (see Table A.6). Indeed, anticipatory durable goods spending is quite large, consistent with recent work suggesting minimum wage increases relax credit constraints (see Dettling and Hsu, 2017).[32] Our examination of the relationship between minimum wages and consumer debt holdings in Section 4.4 supports this idea. As expected, consumption growth is also positively related to local economic conditions, with the estimated BEG effects somewhat larger than the corresponding effects for inflation. However, controlling for local economic conditions again has little impact on our estimated minimum wage effects.[33]

Our estimated food away and food at home consumption responses to minimum wage hikes are also noticeably larger than the respective food price effects in Table 1, suggesting that nominal food consumption increases more than the amount that would be implied by higher prices alone. That is, consumers appear to adjust the amount of food that they consume when the minimum wage rises, with the response of food away being more immediate, and the rise in food at home occurring over time. We use our constructed real consumption data to investigate this finding further.

Table 3 reports estimates of the relationship between minimum wage changes and *real* consumption growth. Real food away and real food at home spending growth rises following an increase in the minimum wage, with real food away rising more quickly and the gains in real food at home occurring more slowly but lasting longer. Despite the increase in real food away expenditures following a minimum wage hike, overall real PCE growth is essentially unchanged as overall inflation and overall nominal PCE growth rise by similar amounts. The same is true for real service expenditures. Real spending on durable goods also rises, at least initially, following an increase in the minimum wage

[32]Similarly, Aaronson, Agarwal, and French (2012) document an increase in automobile purchases by low-income individuals when minimum wages increase.

[33]These results are available upon request.

although this response is not precisely estimated. This real durable spending response is larger and more precisely estimated when we control for differences in the share of low-wage workers across locations (see section 4.3).

The finding that some categories of real consumption growth rise following an increase in the minimum wage suggest that the average consumer is better off. While we cannot directly measure whether the increase in real consumption is primarily coming from households with low-wage workers, if the spending gains are at least proportional, then this finding runs counter to the conclusion in MaCurdy (2015) that minimum wage changes provide little benefit to the poor. Our results are broadly consistent with Alonso (2016) and Leung (2018), studies that also find some evidence of increases in real (non-durable) sales following a minimum wage hike. These authors take different approaches to estimating real consumption, with the approach in Leung (2018) most similar to ours.

Interpretation and Implications

Our results for real food spending raise the following question: How do price increases lead to more real food consumption? Basic theory suggests that, for normal goods, quantities fall when prices rise. However, the standard price-quantity theory is based on holding income fixed (uncompensated demand). An increase in the minimum wage also causes incomes to rise. Additionally, there are distributional effects. Prices (presumably) rise for all consumers, but the increase in income primarily affects low-wage workers who have higher propensities to consume food out of income gains than higher-wage workers. Indeed, using data from the Consumer Expenditure Survey (CEX) we find that on average individuals in the bottom 20 percent of the income distribution spend roughly 33 percent of their after tax income on food (22 percent on food at home and 11 percent on food away), whereas individuals in the top 20 percent of the distribution spend only about 9 percent.[34] Finally, there could be local general equilibrium effects. Greater spending

[34]These results are based on summary CEX data published by the BLS for 2015 and can be found

by low-wage workers may stimulate the local economy, leading to higher incomes and consumption than without such local aggregate equilibrium effects.

Is it possible that the increase in real food consumption is driven by redistributive factors alone, without any local general equilibrium effects? In theory, yes, given low-wage workers relatively high propensity to consume food (based on their income share of spending). Thus, because increases in the minimum wage accrue primarily to households in the bottom quintile of the income distribution, there can be a disproportionate increase in the demand for food consumption.

However, an extreme assumption is required for this scenario to be plausible. Specifically, the demand for food by high-wage workers must be highly price inelastic, so that their consumption demand remains stable and their continued purchases 'pay for' much of the increase in the minimum wage. Also, the income effect of the minimum wage has to substantially dominate the substitution effect of the food price increase for low-wage workers.[35] These conditions seem very stringent, particularly the inelasticity of demand for high-wage workers.

The scenario becomes more plausible if the cost increase caused by an increase in the minimum wage is only partly passed through to prices. This follows directly from the fact that the income effect dominates the substitution effect because the income increase becomes larger relative to the price change. To see this directly, consider the increase in consumption of food away from home. For a 0.4 percentage point inflation increase, the only way to get a larger increase in nominal spending on food away is to have a low

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here: https://www.bls.gov/cex/2015/combined/quintile.pdf.

[35] Also, any decrease in profits (as firms' costs rise in response to a minimum wage hike and prices do not rise sufficiently to offset) must not lead to lower demand by firm owners for food consumption in a given city. Demand would not necessarily decline if, however, firm owners live outside the local area. An example would be a decline in profits at a local McDonalds' franchise that is owned by the parent company or a large franchisee based elsewhere. Across broader geographies any distributional spending effects from low-wage workers' income gains when minimum wages rise will be more muted as the incomes of higher earners decline (due to lost profits) if price changes do not fully offset increased labor costs. Even then, we would still expect some spending distributional effects.

price elasticity of demand for food away and a large increase in demand from the income effects of the minimum wage increase. Given a propensity of the bottom income quintile to spend roughly 11 percent of their income on food away from home, it is therefore necessary that the income increase be significantly larger in total dollar terms than the increase in price times total ex-ante spending on food away from home. That is, the increase in costs must be only partly passed through into prices.

These arguments imply that the minimum wage either has a stimulative effect on the local economy so as to cause a net rise in food consumption or is only partly passed through into food prices, or both. A partial pass-through effect may seem at odds with our claim in Section 4.1 that the pass-through of minimum wages to food away prices is relatively large. However, that argument is based only on considering the share of minimum wage workers' salaries in a firm's overall marginal cost (due to data limitations). Indeed, the pass-through could still be small relative to all cost increases associated with the minimum wage (input prices and (spillover) costs associated with non-minimum-wage workers) if local aggregate equilibrium effects are at play.

4.3 Are the Effects Bigger When More Workers are Affected?

The relationship between minimum wage changes and local aggregate outcomes should depend on the number of workers the minimum wage affects in a given location. When minimum wage changes apply to a limited number of workers, perhaps because the number of low-wage workers in a location is fairly low, then we would expect relatively small economic responses, whereas we would expect larger changes when many workers are affected. Indeed, when we allow for the relationship between minimum wages and inflation (or consumption) to vary with the share of low-wage workers by city, we find some evidence that the price (or spending) response to minimum wage changes is larger in areas where the low-wage worker share is larger.[36] Higher prices in locations with a greater proportion of low-wage workers are consistent with labor costs increasing more in those cities, leading local firms to raise their prices more to offset their higher costs. Similarly, more spending in locations with a greater proportion of low-wage workers is consistent with greater overall income gains from changes in the minimum wage in those areas.

Table 4 reports these results, with the estimates for prices in the upper panel, and estimates for nominal and real consumption growth in the lower panels. Rather than show all the estimates for both the direct minimum wage effects and the incremental (interaction) effects for low-wage workers, we report only the contemporaneous (impact) effects and the respective cumulative effects. The heterogenous treatment effect (HTE) has been standardized so that its coefficient can be interpreted as the differential effect of the minimum wage change for locations with a one standard deviation larger share of low-wage workers relative to the sample mean.

In general, prices rise somewhat more on impact (positive HTE) in locations with a greater share of low-wage workers, with the largest differential effect for food away prices. Controlling for the share of low-wage workers across locations also tends to increase the size and precision of the direct (contemporaneous) inflation response to minimum wage changes across price categories. The cumulative (direct) inflation effects are also somewhat larger. In addition, the cumulative inflation HTEs, while fairly small, tend to be fairly precisely estimated especially for the broader price categories and for food away. In terms of interpretation, the results suggest that all-items inflation is cumulatively 0.08 percentage points higher than average following a 10 percent increase in minimum wages in locations with a one-standard deviation higher share of low-wage workers. Relative to

[36] As discussed in Section 2, low-wage workers are those whose wages are within 110 percent of the minimum wage in a given location at beginning of the period over which the minimum wage change is measured, $t-1$, to avoid potential endogeneity. Our results are robust to alternative (higher) cut-offs for defining low-wage workers. We use a threshold above the local minimum wage to account for potential spillover effects to workers earning somewhat more than the minimum wage.

the direct (cumulative) effect of 0.38 percentage points (for a 10 percent minimum wage hike), this differential inflation effect is non-trivial but not large. Overall, the results imply that prices increase more in areas where more workers are affected by a minimum wage change.

The pattern of results for nominal consumption growth is similar—the direct spending response is somewhat stronger than when we do not control for the share of low-wage workers across locations, and there is evidence of a small but positive differential effect in areas with a higher share of low-wage workers. However the cumulative HTE effects for consumption growth tend to be smaller and insignificant despite a spending growth response to minimum wage hikes that, at least initially, is larger (and generally significant) in locations with a greater share of low-wage workers. In terms of real consumption, the overall results are not much different from our baseline findings. Since nominal expenditure growth tends to rise in line with inflation, real PCE growth—both overall and for the majority the PCE subcategories—is unchanged except for real food consumption, which increases at home and away from home in a manner very similar to our baseline results. However, controlling for the share of low-wage workers in a location does not appear to have much effect on the response of real food spending to minimum wage hikes.

One particularly relevant result that comes out of this analysis, as we noted earlier, is that there is a strong contemporaneous, and precisely estimated, response of nominal and real durable good spending to a minimum wage hike. Higher real durable goods consumption growth does not persist, in part because as we saw earlier durable goods prices rise with a lag. However, it is consistent with the idea that demand for durable goods rises following an increase in the minimum wage (or perhaps even in anticipation of an increase—see Table A.7) even though the estimates we get are imprecise when we do not control for HTE. The observed durable goods spending response is further consistent with our results regarding auto loan debt growth and individuals' success obtaining credit more generally following a minimum wage hike that we discuss next.

4.4 Minimum Wage Changes and Debt

We use the CCP data to show that households with low credit scores decrease total debt in response to minimum wage increases, whereas auto loan debt growth increases temporarily. Also, credit appears to become easier to obtain, as measured by the number of open accounts relative to credit inquiries (success rate).

Since we are interested in local aggregate outcomes, we aggregate the individual-level CCP data to the city level for our debt and credit measures of interest. We separately examine people by their creditworthiness: everyone (the most inclusive group), subprime borrowers (those with Equifax risk/credit scores below 660, about 40 percent of the sample), young individuals (people 35 years-old or younger, 27 percent), and subprime and young combined (14 percent). For each city and year, we calculate total debt (or auto loans) by adding the debt balances of all individuals within the city borders, and compute the city-level annual percentage change in debt.[37] We also calculate a credit inquiry "success rate" by taking the city average of the ratio of an individual's number of open accounts in the last 12 months relative to his/her number of credit inquiries over the same horizon.[38] We run regressions that parallel our specification for inflation and consumption growth (equation 1) with the following dependent variables: (1) percentage change in total debt; (2) percentage change in auto loans; (3) success rates.

Table 5 summarizes the results for total debt, which is little changed when minimum wages rise for the population as a whole (column 1) and for the young (column 3). In

[37]The CCP data are quarterly, therefore we average debt balances over the four quarters in a given year. Our findings are similar if we only use data for the last quarter of each year instead. Results are also similar if we use average debt instead of total debt in a given city to compute the city-level percent changes.

[38]Our definition of success rates follows Amromin, Nardi, and Schulze (2017). Unfortunately, the CCP data do not allow us to easily determine the type of account opened.

contrast, total debt balances decline noticeably for subprime borrowers (column 2).[39] There are several possible explanations for these results. First, minimum-wage workers are not necessarily subprime borrowers, but to the extent that some of them are, lower debt balances could indicate that minimum wage increases allow some borrowers to repay debt. Alternatively, if credit supply is fixed, non-minimum wage subprime borrowers could face more competition for credit from minimum-wage borrowers with better credit scores and improved income prospects following a minimum wage hike. Finally, it is also possible that the share of subprime individuals in the population declines with an increase in the minimum wage, and debt for the subprime group decreases simply because there are fewer individuals in the group. Indeed, column (5) of Table 7 shows that there is a small decline in the share of the population with subprime credit scores during and following a minimum wage hike.

In comparison, there is a clear increase in auto loan debt (debt incurred for the purchase of vehicles) when minimum wages rise. The estimates in Table 6, imply that auto debt increases 8.6 percent in the year that the minimum wage changes (for a 10 percent increase in the minimum wage)—with a clear reversal the following year. The auto debt increase is slightly larger for the subprime and the young groups (9.4 percent). The increase in auto loans is further consistent with the positive, but not always statistically significant, relationship between minimum wages hikes and durable goods purchases (a broader category than autos) that we documented in Section 4.2. Greater demand for autos could partly explain the positive relationship between minimum wage changes and lagged durable goods prices that we document in Table 1.

We also find that minimum wage increases correlate with higher success rates at the city level, consistent with an increase in credit availability for low-wage workers following a minimum wage hike (see Table 7). We do not observe individuals who do not apply

[39] Although not tabulated, both mortgage debt as well as credit card balances, which in Equifax are a hybrid of current spending and revolving balances, decrease for this group.

for credit, but there seems to be an actual increase in credit supply since we do not see significant changes in the share of people with credit inquiries following minimum wage changes. That is, more people who apply for credit seem to receive it following a minimum wage increase. The estimates in Table 7 further show that the improvement in success rates is particularly large for the subprime-young group, and the increase in success rates continues over time across all groups. Overall, it appears that minimum wage increases help relax credit constraints.

Our debt-related findings are consistent with Aaronson, Agarwal, and French (2012), which documents that debt, in particular collateralized debt tied to vehicles, increases with minimum wages for low-income individuals.[40] Our results are also consistent with Dettling and Hsu (2017), which also uses the CCP and shows that increases in minimum wages cause a decrease in credit card delinquency, an increase in the number of credit cards, and increases in credit scores for likely minimum-wage workers—defined as individuals in census tracts where the majority of adults have less than a high school education.[41] Dettling and Hsu (2017) further documents that minimum wage increases correlate with additional direct-mail credit card offers and better credit terms for low-income individuals. The authors conclude that minimum wage increases alleviate borrowing constraints in unsecured credit markets, improving low-income borrowers' finances and credit scores.

5 Conclusion

While there has been much debate about the effect of minimum wage increases on the economy, and especially employment, the estimated effects are mixed and typically small. In this paper, we focus on the less-studied relationship between minimum wage increases

[40] Aaronson, Agarwal, and French (2012) also use credit bureau data, but their sample is not nationally representative in the sense that borrowers must have a credit card to be included. Compared to their data, the CCP is nationally representative but it lacks information on income.

[41] Dettling and Hsu (2017) find no effect on card balances or utilization.

and inflation, consumption growth, consumer debt growth, and credit supply. We find small but significant effects of minimum wage changes on prices and household spending. Prices and consumption increase, especially in the food sector, where firms tend to employ a large number of minimum- and low-wage workers. This finding suggests that when minimum wages rise, companies at least partially offset their higher labor costs by increasing their prices. We also find that households increase the *quantity* of food that they consume at home and away from home following minimum wage hikes. Finally, increases in the minimum wage reduce the total debt of individuals with low credit scores, who are potentially minimum wage workers, while increasing auto debt growth and access to consumer credit.

Besides focusing on inflation and consumption, our research contributes to the minimum wage literature by examining the broader local aggregate outcomes associated with minimum wage changes. The effect that minimum wage increases have on the macroeconomy is likely going to become more relevant as more local governments debate raising minimum wages. Indeed, we have already observed many states and some cities or counties starting or continuing to raise their minimum wages toward $15 per hour (or beyond). When thinking about the impact of higher minimum wages on the overall economy, one should keep in mind that while our estimated price and spending effects are relatively small, these findings are based on historical changes in the minimum wage that are also not large (averaging about 5 percent annually, conditional on a change occurring). In addition, recent findings by Dettling and Hsu (2017) as well as our own suggest that cost-benefit analyses of social policies such as an increase in the minimum wage should consider interactions with credit markets and financial well-being more generally.

There is some concern that there could be so-called threshold effects associated with increases in the minimum wage. That is, the effect of the minimum wage on the economy will be differentially (nonlinearly) larger when the size of the change in the minimum wage increases or the level of the minimum wage itself grows. Indeed, Jardim et al. (2017) find some evidence of threshold effects when examining recent changes in the city-level minimum wage in Seattle. Note as well, that so far states and other localities have increased their minimum wages at a gradual pace. This does not mean, however, that minimum wage changes will continue to be small. Should the hikes become much larger, the local aggregate inflation, consumption, and consumer debt implications of these changes could be more substantial and may require more attention from policymakers.

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Table 1: Baseline: Minimum Wage Changes and Inflation

	(1) All	(2) All x Energy	(3) Core	(4) Dur	(5) Nondur	(6) Serv	(7) Food at Home	(8) Food Away
Pct. Chg. Min. Wage (t)	0.014	0.013	0.011	–0.003	0.007	0.017	–0.002	0.042***
	(0.008)	(0.009)	(0.011)	(0.011)	(0.006)	(0.013)	(0.011)	(0.011)
Pct. Chg. Min. Wage (t-1)	0.010	0.010	0.010	0.034**	0.011	0.000	0.001	0.011
	(0.011)	(0.010)	(0.012)	(0.015)	(0.013)	(0.015)	(0.012)	(0.014)
Bartik Emp. Growth	0.044	0.056	0.047	0.905**	0.399	–0.332	0.028	0.112
	(0.332)	(0.327)	(0.356)	(0.393)	(0.301)	(0.457)	(0.243)	(0.390)
Memo:								
Two-year Min. Wage Effect†	0.024	0.022	0.022	0.030	0.018	0.018	–0.001	0.053
P-Value	[0.144]	[0.144]	[0.188]	[0.149]	[0.269]	[0.413]	[0.949]	[0.006]
Observations	528	528	528	528	528	528	528	528
Adjusted R^2	0.680	0.318	0.268	0.450	0.915	0.401	0.736	0.294

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is inflation (price growth) for the CPI category indicated at the top of each column. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table 2: Minimum Wage Changes and Nominal Consumption Growth

	(1) Total PCE	(2) Core PCE	(3) Dur	(4) Nondur	(5) Serv	(6) Food at Home	(7) Food Away
Pct. Chg. Min. Wage (t)	0.022**	0.012	0.028	0.029*	0.021***	0.030**	0.094***
	(0.009)	(0.009)	(0.025)	(0.015)	(0.007)	(0.012)	(0.013)
Pct. Chg. Min. Wage (t-1)	–0.007	–0.012	0.002	0.014	–0.017*	0.020	–0.005
	(0.011)	(0.011)	(0.026)	(0.013)	(0.009)	(0.015)	(0.022)
Bartik Emp. Growth	0.434	0.344	3.550***	1.049***	–0.442	1.167**	–0.006
	(0.302)	(0.308)	(0.610)	(0.327)	(0.368)	(0.448)	(0.426)
Memo:							
Two-year Min. Wage Effect†	0.015	0.000	0.030	0.043	0.004	0.050	0.089
P-Value	[0.379]	[0.997]	[0.480]	[0.064]	[0.738]	[0.031]	[0.003]
Observations	528	528	528	528	528	528	528
Adjusted R^2	0.851	0.825	0.801	0.853	0.844	0.545	0.689

Notes: The estimates are based on the baseline equation $\Delta y_{i,t}^k = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in consumption growth for the expenditure category indicated at the top of each column. The annual data cover 1999–2017. Core PCE excludes food and energy consumption. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table 3: Minimum Wage Changes and Real Consumption Growth

	(1) Real PCE	(2) Real Core PCE	(3) Dur	(4) Serv	(5) Food at Home	(6) Food Away
Pct. Chg. Min. Wage (t)	0.008	0.001	0.031	0.003	0.033**	0.052***
	(0.009)	(0.012)	(0.032)	(0.011)	(0.012)	(0.014)
Pct. Chg. Min. Wage (t-1)	–0.017	–0.022**	–0.031	–0.017	0.019	–0.016
	(0.011)	(0.010)	(0.025)	(0.012)	(0.019)	(0.030)
Bartik Emp. Growth	0.390	0.298	2.645***	–0.110	1.139**	–0.118
	(0.328)	(0.368)	(0.733)	(0.378)	(0.453)	(0.472)
Memo:						
Two-year Min. Wage Effect†	–0.008	–0.022	0.000	–0.013	0.051	0.036
P-Value	[0.586]	[0.190]	[0.999]	[0.458]	[0.026]	[0.307]
Observations	528	528	528	528	528	528
Adjusted R^2	0.723	0.725	0.763	0.588	0.458	0.641

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in real consumption growth for the expenditure category indicated at the top of each column. The annual data cover 1999–2017. Core PCE excludes food and energy consumption. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

TABLE 4: Robustness: Controlling for the Share of Low-Wage Workers

Panel A: Inflation Results

	(1) All	(2) All x Energy	(3) Core	(4) Dur	(5) Nondur	(6) Serv	(7) Food at Home	(8) Food Away
Pct. Chg. Min. Wage (t)	0.028***	0.027***	0.025**	–0.005	0.013	0.034***	0.014	0.064***
	(0.009)	(0.008)	(0.010)	(0.015)	(0.010)	(0.012)	(0.023)	(0.016)
Heterogenous Treatment Effect [HTE] (t)	0.005*	0.005**	0.005*	–0.000	0.003	0.007*	0.003	0.007**
	(0.003)	(0.002)	(0.003)	(0.004)	(0.003)	(0.004)	(0.007)	(0.003)
Bartik Empl. Growth	0.036	0.032	0.032	0.899**	0.384	–0.328	–0.056	0.067
	(0.344)	(0.341)	(0.369)	(0.401)	(0.303)	(0.476)	(0.253)	(0.397)
Memo:								
Two-year Min. Wage Effect†	0.038	0.035	0.037	0.036	0.034	0.030	–0.002	0.059
P-Value	[0.026]	[0.024]	[0.030]	[0.149]	[0.051]	[0.173]	[0.911]	[0.002]
Two-year HTE†	0.008	0.008	0.009	0.003	0.009	0.008	0.003	0.006
P-Value	[0.033]	[0.009]	[0.009]	[0.642]	[0.015]	[0.123]	[0.524]	[0.076]
Observations	528	528	528	528	528	528	528	528
Adjusted R^2	0.684	0.330	0.277	0.448	0.916	0.404	0.740	0.302

Panel B: Consumption Growth Results

	(1) Total PCE	(2) Core PCE	(3) Dur	(4) Nondur	(5) Serv	(6) Food at Home	(7) Food Away
Pct. Chg. Min. Wage (t)	0.039***	0.026***	0.053**	0.045**	0.033***	0.038**	0.129***
	(0.009)	(0.009)	(0.023)	(0.017)	(0.008)	(0.017)	(0.014)
Heterogenous Treatment Effect [HTE] (t)	0.006***	0.005***	0.005	0.005*	0.005***	0.001	0.011***
	(0.001)	(0.002)	(0.008)	(0.003)	(0.001)	(0.003)	(0.004)
Bartik Empl. Growth	0.413	0.326	3.449***	1.019***	–0.439	1.153**	–0.065
	(0.324)	(0.331)	(0.579)	(0.357)	(0.382)	(0.475)	(0.438)
Memo:							
Two-year Min. Wage Effect†	0.021	0.004	0.013	0.046	0.012	0.031	0.100
P-Value	[0.210]	[0.814]	[0.721]	[0.063]	[0.303]	[0.215]	[0.003]
Two-year HTE†	0.005	0.004	–0.003	0.004	0.005	–0.008	0.010
P-Value	[0.207]	[0.359]	[0.824]	[0.404]	[0.033]	[0.116]	[0.099]
Observations	528	528	528	528	528	528	528
Adjusted R^2	0.852	0.825	0.801	0.853	0.845	0.547	0.693

Panel C: Real Consumption Growth Results

	(1) Real PCE	(2) Real Core PCE	(3) Dur	(4) Serv	(5) Food at Home	(6) Food Away
Pct. Chg. Min. Wage (t)	0.011	0.001	0.058**	–0.001	0.024	0.065***
	(0.010)	(0.012)	(0.028)	(0.012)	(0.020)	(0.020)
Heterogenous Treatment Effect [HTE] (t)	0.000	–0.000	0.005	–0.002	–0.001	0.005
	(0.003)	(0.003)	(0.006)	(0.003)	(0.007)	(0.005)
Bartik Empl. Growth	0.377	0.294	2.550***	–0.110	1.210**	–0.131
	(0.337)	(0.381)	(0.727)	(0.386)	(0.458)	(0.470)
Memo:						
Two-year Min. Wage Effect†	–0.017	–0.034	–0.023	–0.018	0.033	0.041
P-Value	[0.357]	[0.061]	[0.624]	[0.367]	[0.206]	[0.262]
Two-year HTE†	–0.004	–0.006	–0.006	–0.003	–0.012	0.004
P-Value	[0.528]	[0.305]	[0.631]	[0.594]	[0.181]	[0.505]
Observations	528	528	528	528	528	528
Adjusted R^2	0.722	0.725	0.764	0.586	0.464	0.639

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$. where the dependent variable is inflation (top panel) or the percent change in consumption growth (panel B, C) for the category noted at the top of each column. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. †Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table 5: Total Debt and Minimum Wage Changes

	(1) All	(2) Sub660	(3) Young	(4) Sub-Prime and Young
Pct. Chg. Min. Wage (t)	–0.032	–0.208**	0.023	–0.093
	(0.040)	(0.075)	(0.045)	(0.059)
Pct. Chg. Min. Wage (t-1)	–0.040	–0.159*	0.016	–0.031
	(0.035)	(0.087)	(0.051)	(0.059)
Bartik Empl. Growth	–3.084	–2.306	–1.448	–1.784
	(3.429)	(2.550)	(4.102)	(2.794)
Memo:				
Two-year Min. Wage Effect†	–0.072	–0.367	0.039	–0.125
P-Value	[0.242]	[0.023]	[0.608]	[0.243]
Observations	504	504	504	504
Adjusted R^2	0.680	0.629	0.662	0.642

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in total debt balances for the borrower group indicated at the top of each column. The annual data cover 2000–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table 6: Auto Loans and Minimum Wage Changes

	(1) All	(2) Sub660	(3) Young	(4) Sub-Prime and Young
Pct. Chg. Min. Wage (t)	0.086**	0.094**	0.094**	0.084*
	(0.038)	(0.042)	(0.037)	(0.046)
Pct. Chg. Min. Wage (t-1)	–0.125*	–0.137*	–0.136*	–0.118
	(0.066)	(0.071)	(0.079)	(0.088)
Bartik Empl. Growth	–1.508	–1.473	–0.536	–0.543
	(3.120)	(2.485)	(3.808)	(3.282)
Memo:				
Two-year Min. Wage Effect†	–0.039	–0.043	–0.042	–0.033
P-Value	[0.602]	[0.602]	[0.579]	[0.696]
Observations	504	504	504	504
Adjusted R^2	0.744	0.738	0.733	0.742

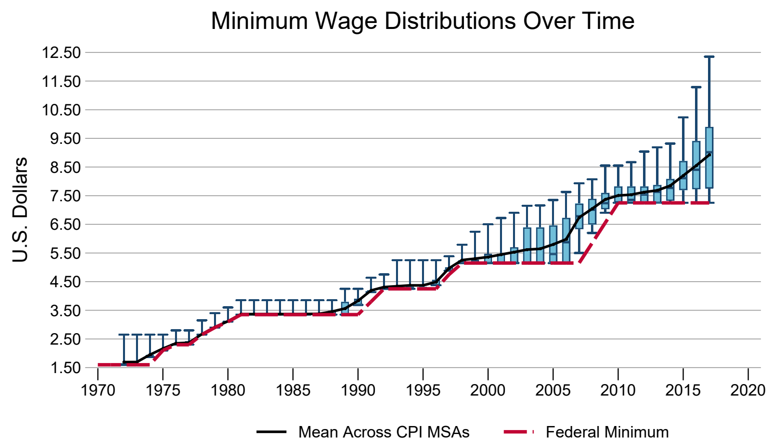
Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in total debt balances for the borrower group indicated at the top of each column. The annual data cover 2000–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table 7: Success in Credit Applications, the Subprime Share, and Minimum Wage Changes

	(1)	(2)	(3)	(4)	(5)
	Success Rate				Change
	Total Sample	Subprime	Young	Subprime Young	Subprime Share
Pct. Chg. Min. Wage (t)	0.077*	0.083**	0.112**	0.118***	–0.010*
	(0.039)	(0.035)	(0.042)	(0.041)	(0.005)
Pct. Chg. Min. Wage (t-1)	0.089**	0.118***	0.119**	0.131***	–0.007
	(0.032)	(0.038)	(0.044)	(0.043)	(0.005)
Bartik Emp. Growth	–6.776*	–4.622	–6.667*	–4.309	–0.092
	(3.304)	(2.980)	(3.868)	(3.057)	(0.170)
Memo:					
Two-year Min. Wage Effect†	0.165	0.201	0.231	0.249	–0.017
P-Value	[0.015]	[0.006]	[0.007]	[0.003]	[0.066]
Observations	532	532	532	532	504
Adjusted R^2	0.898	0.879	0.870	0.855	0.618

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in total debt balances for the borrower group indicated at the top of each column. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

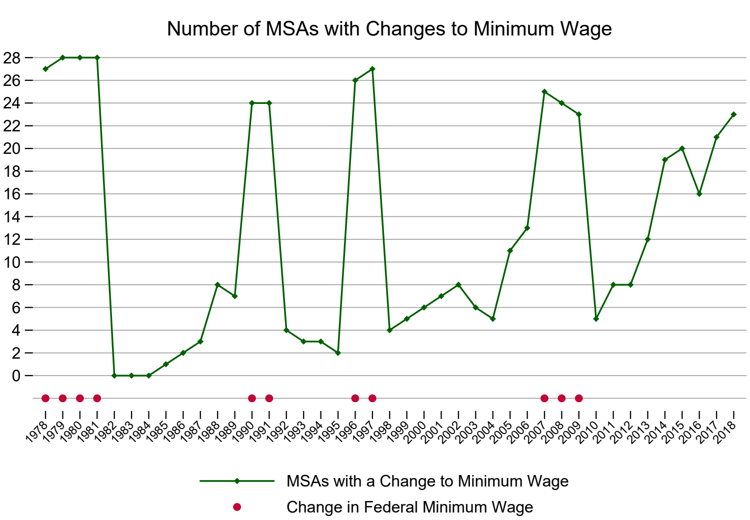
Figure 1: The Effective (Nominal) Minimum Wage over Time



Note: The bars indicate the 25th, 50th, and 75th percentiles of the minimum wage across all 28 CPI MSAs, and the whiskers indicate minimum and maximum values.

Source: Minimum wage data come from Federal and State Departments of Labor and city governments

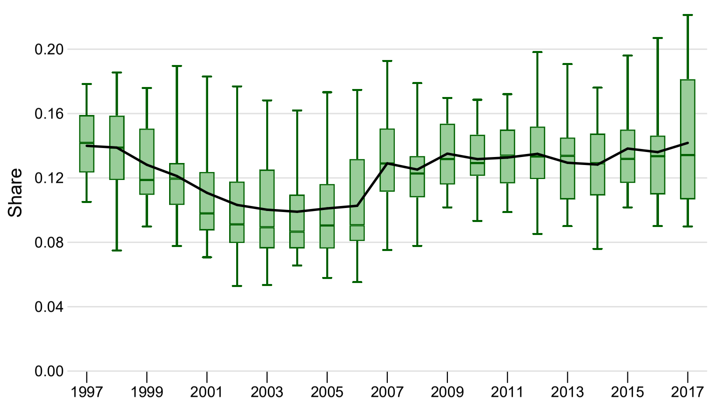
Figure 2: The Timing of Minimum Wage Changes



Source: Minimum wage data come from Federal and State Departments of Labor and city governments

FIGURE 3: Share of Low-Wage Workers

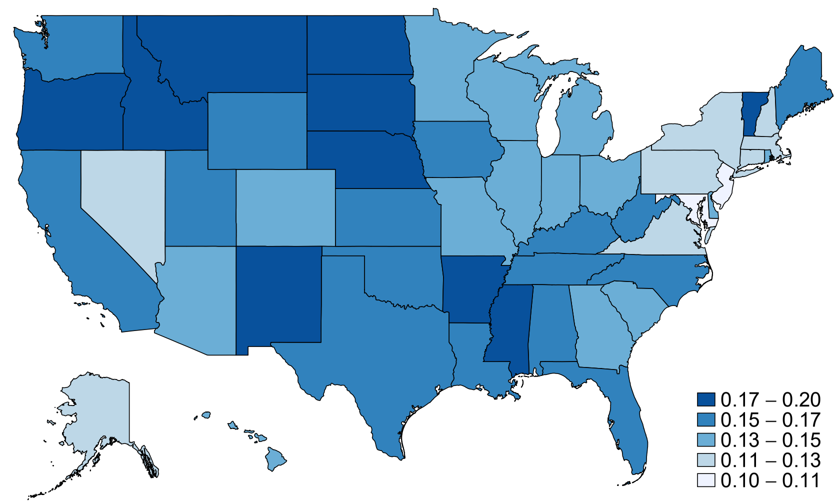
Over Time



Note: The box and whiskers show the interquartile range, minimum, and maximum low-wage worker share across workers in a CPI MSA. The black line indicates the mean across 28 CPI MSAs

Source: Authors' calculations using the Current Population Survey (CPS).

Average Share Across States (1997–2017)



Source: Authors' calculations using Current Population Survey (CPS) data.

A Appendix

List of Metropolitan Statistical Areas with CPI Data

(1) Anchorage, (2) Atlanta, (3) Baltimore-Columbia-Towson, (4) Boston-Brockton-Nashua, (5) Chicago-Gary-Kenosha, (6) Cincinnati-Hamilton, (7) Cleveland-Akron, (8) Dallas-Fort Worth, (9) Denver-Boulder-Greeley, (10) Detroit-Ann Arbor-Flint, (11) Honolulu, (12) Houston-Galveston-Brazoria, (13) Kansas City, (14) Los Angeles-Long Beach-Anaheim, (15) Miami-Fort Lauderdale, (16) Milwaukee-Racine, (17) Minneapolis-St. Paul, (18) New York-Northern New Jersey-Long Island, (19) Philadelphia-Wilmington-Atlantic City, (20) Phoenix-Mesa, (21) Pittsburgh, (22) Portland-Salem, (23) San Diego, (24) San Francisco-Oakland-San Jose, (25) Seattle-Tacoma-Bremerton, (26) St. Louis, (27) Tampa-St. Petersburg-Clearwater, and (28) Washington-Arlington-Alexandria.

Summary Statistics

Table A.1: Summary Statistics: Change in Minimum Wage and Share of Low-Wage Workers across Cities

	Min	Max	p50	Mean	Mean|Δ	sd
Pct. Chg. Min. Wage (t)	–0.412	33.010	0.260	2.909	5.155	5.080
Share of Low-Wage Workers (t-1)	5.288	20.701	12.126	12.235		3.133

Table A.2: Summary Statistics: CPI Inflation and Its Components

	All	All x Energy	Core	Dur	Nondur	Serv	Food at Home	Food Away
Min	–2.643	-0.716	–1.190	–5.740	–6.754	–1.196	–3.403	–1.715
Max	6.021	5.349	5.478	8.279	9.080	8.012	8.545	7.826
p50	2.237	2.078	1.988	–0.955	2.707	2.724	1.988	2.667
Mean	2.240	2.120	2.069	–0.943	2.202	2.797	2.130	2.760
sd	1.293	0.894	0.971	1.605	2.885	1.353	2.030	1.210

Table A.3: Summary Statistics: PCE Growth and Its Components

	Total PCE	Core PCE	Dur	Nondur	Serv	Food at Home	Food Away
Min	–3.162	–2.210	–13.453	–6.747	–0.766	–2.711	–4.044
Max	10.213	10.181	13.005	12.714	10.399	11.289	12.746
p50	4.348	4.397	3.941	4.007	4.795	3.690	4.706
Mean	4.414	4.450	3.203	3.860	4.753	3.675	4.824
sd	2.100	1.948	4.560	3.209	1.794	2.151	2.702

Table A.4: Summary Statistics: Debt Changes and Success Rates

Panel A: Total Debt Change

	All	Subprime	Young	Subprime Young
Min	–10.152	–23.232	–19.414	–26.052
Max	119.995	130.152	118.425	122.804
p50	3.849	1.928	3.079	1.283
Mean	6.140	3.713	4.508	2.539
sd	11.636	13.446	12.205	12.768

Panel B: Auto Debt Change

	All	Subprime	Young	Subprime Young
Min	–12.842	–16.774	–17.839	–21.175
Max	128.594	136.403	128.701	137.017
p50	6.309	5.172	5.128	4.265
Mean	7.716	6.306	6.264	5.182
sd	13.467	13.872	13.951	14.961

Panel C: Success Rate and Change in Subprime Share

	Success Rate				Change
	Total Sample	Subprime	Young	Subprime Young	Subprime Share
Min	46.035	31.776	44.125	35.388	–3.432
Max	129.708	105.773	132.898	109.105	2.325
p50	73.979	53.554	71.314	58.061	–0.482
Mean	75.422	55.444	73.190	59.735	–0.563
sd	15.145	13.474	15.625	13.346	0.788

Source: NY Fed Consumer Credit Panel/Equifax.

Results Allowing for Anticipatory Effects

Table A.5: Baseline: Minimum Wage Changes and Inflation, with Lead

	(1) All	(2) All x Energy	(3) Core	(4) Dur	(5) Nondur	(6) Serv	(7) Food at Home	(8) Food Away
Pct. Chg. Min. Wage (t)	0.012	0.011	0.010	–0.006	0.007	0.015	–0.003	0.041***
	(0.008)	(0.009)	(0.010)	(0.012)	(0.006)	(0.012)	(0.011)	(0.011)
Pct. Chg. Min. Wage (t-1)	0.012	0.011	0.012	0.036**	0.011	0.002	0.002	0.012
	(0.012)	(0.010)	(0.012)	(0.014)	(0.013)	(0.015)	(0.012)	(0.014)
Pct. Chg. Min. Wage (t+1)	0.012	0.010	0.010	0.016	–0.000	0.014	0.005	0.006
	(0.011)	(0.011)	(0.012)	(0.017)	(0.009)	(0.016)	(0.009)	(0.008)
Bartik Emp. Growth	0.070	0.077	0.069	0.940**	0.399	–0.302	0.038	0.124
	(0.347)	(0.336)	(0.363)	(0.389)	(0.299)	(0.485)	(0.249)	(0.398)
Memo:								
Two-year Min. Wage Effect†	0.024	0.022	0.022	0.030	0.018	0.018	–0.001	0.053
P-Value	[0.140]	[0.143]	[0.186]	[0.146]	[0.269]	[0.416]	[0.947]	[0.007]
Total Min. Wage Effects‡	0.036	0.032	0.032	0.046	0.018	0.032	0.004	0.058
P-Value	[0.115]	[0.138]	[0.157]	[0.054]	[0.421]	[0.285]	[0.857]	[0.012]
Observations	528	528	528	528	528	528	528	528
Adjusted R^2	0.681	0.319	0.268	0.451	0.915	0.402	0.735	0.293

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=-1}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is inflation (price growth) for the CPI category indicated at the top of each column. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects); ‡ The total effect of the minimum wage change including any anticipatory effect (sum of contemporaneous, lagged, and lead effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table A.6: Minimum Wage Changes and Nominal Consumption Growth, with Lead

	(1) Total PCE	(2) Core PCE	(3) Dur	(4) Nondur	(5) Serv	(6) Food at Home	(7) Food Away
Pct. Chg. Min. Wage (t)	0.020**	0.010	0.020	0.026*	0.020***	0.028**	0.093***
	(0.009)	(0.009)	(0.025)	(0.015)	(0.007)	(0.012)	(0.013)
Pct. Chg. Min. Wage (t-1)	–0.005	–0.010	0.010	0.017	–0.016**	0.022	–0.005
	(0.011)	(0.011)	(0.026)	(0.013)	(0.008)	(0.014)	(0.021)
Pct. Chg. Min. Wage (t+1)	0.015	0.014	0.053*	0.021	0.002	0.017	0.006
	(0.012)	(0.012)	(0.028)	(0.013)	(0.011)	(0.015)	(0.024)
Bartik Emp. Growth	0.466	0.374	3.665***	1.095***	–0.438	1.204**	0.008
	(0.317)	(0.324)	(0.590)	(0.344)	(0.381)	(0.454)	(0.436)
Memo:							
Two-year Min. Wage Effect†	0.015	–0.000	0.030	0.043	0.004	0.050	0.089
P-Value	[0.379]	[0.998]	[0.477]	[0.064]	[0.739]	[0.031]	[0.003]
Total Min. Wage Effects‡	0.030	0.013	0.083	0.064	0.006	0.067	0.095
P-Value	[0.140]	[0.481]	[0.123]	[0.022]	[0.688]	[0.013]	[0.008]
Observations	528	528	528	528	528	528	528
Adjusted R^2	0.852	0.825	0.803	0.853	0.844	0.545	0.689

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=-1}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in consumption growth for the expenditure category indicated at the top of each column. The annual data cover 1999–2017. Core PCE excludes food and energy consumption. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects); ‡ The total effect of the minimum wage change including any anticipatory effect (sum of contemporaneous, lagged, and lead effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table A.7: Minimum Wage Changes and Real Consumption Growth, with Lead

	(1) Real PCE	(2) Real Core PCE	(3) Dur	(4) Serv	(5) Food at Home	(6) Food Away
Pct. Chg. Min. Wage (t)	0.008	0.000	0.026	0.005	0.031**	0.052***
	(0.010)	(0.013)	(0.032)	(0.011)	(0.012)	(0.014)
L.Pct. Chg. Min. Wage (t)	–0.016	–0.022**	–0.026	–0.019	0.020	–0.016
	(0.011)	(0.011)	(0.027)	(0.012)	(0.019)	(0.029)
F.Pct. Chg. Min. Wage (t)	0.003	0.003	0.037	–0.012	0.012	0.001
	(0.013)	(0.015)	(0.033)	(0.014)	(0.016)	(0.026)
Bartik Empl. Growth	0.395	0.305	2.724***	–0.137	1.166**	–0.117
	(0.318)	(0.354)	(0.713)	(0.381)	(0.454)	(0.455)
Memo:						
Two-year Min. Wage Effect†	–0.008	–0.022	–0.000	–0.013	0.051	0.036
P-Value	[0.586]	[0.190]	[0.996]	[0.462]	[0.028]	[0.308]
Total Min. Wage Effects‡	–0.006	–0.018	0.036	–0.026	0.063	0.036
P-Value	[0.770]	[0.353]	[0.564]	[0.268]	[0.024]	[0.349]
Observations	528	528	528	528	528	528
Adjusted R^2	0.722	0.725	0.764	0.588	0.457	0.640

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=-1}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in real consumption growth for the expenditure category indicated at the top of each column. The annual data cover 1999–2017. Core PCE excludes food and energy consumption. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects); ‡ The total effect of the minimum wage change including any anticipatory effect (sum of contemporaneous, lagged, and lead effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

CPI Results without Bartik Employment Growth

Table A.8: Baseline: Minimum Wage Changes and Inflation. No Control for Economic Conditions

	(1) All	(2) All x Energy	(3) Core	(4) Dur	(5) Nondur	(6) Serv	(7) Food at Home	(8) Food Away
Pct. Chg. Min. Wage (t)	0.014	0.012	0.011	–0.006	0.006	0.018	–0.002	0.042***
	(0.008)	(0.009)	(0.010)	(0.011)	(0.006)	(0.012)	(0.011)	(0.011)
Pct. Chg. Min. Wage (t-1)	0.010	0.009	0.010	0.031*	0.010	0.001	0.001	0.010
	(0.012)	(0.010)	(0.012)	(0.015)	(0.014)	(0.014)	(0.011)	(0.014)
Memo:								
Two-year Min. Wage Effect†	0.024	0.022	0.021	0.024	0.016	0.020	–0.001	0.052
P-Value	[0.152]	[0.148]	[0.194]	[0.241]	[0.376]	[0.354]	[0.939]	[0.004]
Observations	528	528	528	528	528	528	528	528
Adjusted R^2	0.681	0.320	0.269	0.444	0.915	0.401	0.736	0.295

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is inflation (price growth) for the CPI category indicated at the top of each column. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Alternative Controls for Local (Potentially Unobserved) Economic Conditions

In this section, we consider alternative controls for local economic conditions. A potential concern with our analysis is that, while there is a lot of variation in minimum wages across the United States, minimum wage levels and policy changes may not be randomly distributed across states or time. States and/or regions of the country may differ along dimensions other than their minimum wage policies, so there are potential drawbacks to using MSA-level (or state-level) data to estimate the effects of minimum wage changes. In particular, unobserved regional or national factors that are correlated with inflation or consumption growth may also drive changes in minimum wages. Two-way fixed effects models (with a fixed effect for each year and for each location)—like in our baseline specification—have been the traditional approach used in the literature to deal with these confounding factors. However, such models do not control for any type of pre-existing, location-specific trends in the explanatory variable of interest (for example, employment growth). Indeed, much of the recent debate in the minimum wage and employment literature focuses on whether one should control for pre-existing trends in the data or whether doing so "throws away" too much valid identifying information—see, for example, the debate between Neumark, Salas, and Wascher (2014) and Allegretto et al. (2017). Typically, controlling for pre-trends in a two-way fixed effects model lowers the estimated employment effect of a given minimum wage increase.

Totty (2017) approaches controlling for unobserved factors somewhat differently by relying on factor model estimators (interactive effects as opposed to additive effects) following the work of Pesaran (2006) and Bai (2009). In a macroeconomic setting, interactive fixed effects capture common shocks with potential heterogeneous effects on the cross-sectional unit being analyzed. Bai (2009) estimates the common (shocks) factors (and factor loadings) directly, and one difficulty in implementing his method is choosing the correct number of factors.[42] In contrast, Pesaran (2006) uses additional regressors to proxy for the common factors. His estimator calls for the inclusion of the cross-sectional averages of the dependent and independent variables as additional controls.

We check the robustness of our results to unobserved factors using two alternative estimation approaches: (1) including census region-by-period fixed effects instead of just time fixed effects in our baseline estimates; (2) using the estimator proposed by Bai (2009).[43] The results in Table A.9, Panel A incorporate region-by-period fixed effects in our estimates, in addition to the CPI-MSA fixed effects.[44] The estimated relationship between minimum wage changes and food prices barely changes when we include these additional controls; however, we obtain somewhat larger minimum wage effects for the broader CPI categories (all, all excluding energy, and core) and services—more consistent with the regressions that allowed for HTE. Nevertheless, the estimated effects of minimum wage increases on local-aggregate prices remains small.

The results using the proposed estimator by Bai (2009) are reported in Panel B of Table A.9. We use four common factors in the regressions to avoid over-identification, but the results are not very sensitive to the exact number of factors used (particularly for the food inflation categories).[45] The estimated cumulative relationship between a minimum wage increase and food away inflation is of similar magnitude to our baseline result. Applying these alternative control methods to our consumption growth regressions, shown in Tables A.10–A.11, also does not really affect our main conclusions. Indeed, both nominal and real food consumption growth increase noticeably with a minimum wage hike.

[42]In Bai (2009), the estimation model is $Y_{it} = X'_{it}\beta + u_{it}$ and $u_{it} = \lambda'_i F_t + \epsilon_{it}$, where λ'_i is a vector of factor loadings and F_t is a vector of common factors. The two-way fixed effects model is a special case of this more general interactive effects model with $F_t = \left[\begin{smallmatrix} 1 \\ v_t \end{smallmatrix}\right]$, and $\lambda_i = \left[\begin{smallmatrix} \alpha_i \\ 1 \end{smallmatrix}\right]$.

[43]The method in Pesaran (2006) requires a large N and a large T setting, and may not be best suited for our relatively small panel.

[44]MSA or state-specific time trends are often added as well if the independent variable is in levels. Since our independent variable (inflation or consumption growth) is already a growth rate, the MSA-level fixed effects should capture pre-existing, MSA-specific growth trends.

[45]We use the *regife* command in Stata to implement Bai (2009).

Table A.9: Minimum Wage Changes and Inflation. Further Robustness Analysis

	(1) All	(2) All x Energy	(3) Core	(4) Dur	(5) Nondur	(6) Serv	(7) Food at Home	(8) Food Away
	Panel A: Region $\times$ Year Fixed Effects and CPI-MSA Fixed Effects							
Pct. Chg. Min. Wage (t)	0.016*	0.018	0.018	–0.006	0.004	0.025	–0.009	0.042***
	(0.010)	(0.012)	(0.014)	(0.011)	(0.006)	(0.016)	(0.011)	(0.011)
Pct. Chg. Min. Wage (t-1)	0.016	0.014	0.016	0.028**	0.014	0.012	0.000	0.009
	(0.010)	(0.010)	(0.012)	(0.012)	(0.012)	(0.014)	(0.013)	(0.013)
Bartik Emp. Growth	0.370	0.267	0.331	0.940**	0.556*	0.098	–0.009	–0.215
	(0.386)	(0.378)	(0.409)	(0.439)	(0.288)	(0.559)	(0.332)	(0.423)
Memo:								
Two-year Min. Wage Effect†	0.032	0.032	0.034	0.022	0.019	0.037	–0.009	0.051
P-Value	[0.035]	[0.069]	[0.086]	[0.158]	[0.217]	[0.134]	[0.613]	[0.015]
Adjusted R^2	0.706	0.352	0.295	0.468	0.928	0.419	0.758	0.293
	Panel B: Common Factors Model. Bai (2009)							
Pct. Chg. Min. Wage (t)	–0.005	–0.003	–0.009	–0.026*	–0.000	–0.009	–0.004	0.035**
	(0.009)	(0.010)	(0.012)	(0.014)	(0.012)	(0.012)	(0.014)	(0.013)
Pct. Chg. Min. Wage (t-1)	–0.010	–0.008	–0.009	0.004	0.016	–0.026*	–0.001	0.018
	(0.011)	(0.008)	(0.009)	(0.017)	(0.014)	(0.014)	(0.015)	(0.016)
Bartik Emp. Growth	–0.221	–0.168	–0.196	0.283	0.581**	–0.758**	0.135	0.170
	(0.155)	(0.214)	(0.224)	(0.244)	(0.213)	(0.366)	(0.256)	(0.161)
Memo:								
Two-year Min. Wage Effect†	–0.015	–0.011	–0.018	–0.022	0.015	–0.035	–0.005	0.054
P-Value	[0.244]	[0.346]	[0.183]	[0.395]	[0.377]	[0.063]	[0.844]	[0.000]
Observations	528	528	528	528	528	528	528	528

Notes: The estimates in Panel A are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \lambda_l \times \nu_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is inflation for the category noted at the top of each column, and l denotes a census region. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as region $\times$ year fixed effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. The estimates in Panel B are based on Bai's (2009) estimator: $\Delta y^k_{i,t} = \lambda_i' F_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, using four common factors. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table A.10: Minimum Wage Changes and Consumption. Further Robustness Analysis

	(1) Total PCE	(2) Core PCE	(3) Dur	(4) Nondur	(5) Serv	(6) Food at Home	(7) Food Away
	Panel A: Region × Year Fixed Effects and CPI-MSA Fixed Effects						
Pct. Chg. Min. Wage (t)	0.026***	0.015*	0.031	0.038***	0.020***	0.037***	0.102***
	(0.007)	(0.008)	(0.026)	(0.010)	(0.006)	(0.011)	(0.011)
Pct. Chg. Min. Wage (t-1)	–0.017	–0.022	–0.039	0.001	–0.018	0.019	–0.011
	(0.013)	(0.013)	(0.025)	(0.016)	(0.012)	(0.018)	(0.028)
Bartik Emp. Growth	0.242	0.208	2.688***	0.449	–0.296	0.707	–0.568
	(0.349)	(0.353)	(0.700)	(0.422)	(0.377)	(0.544)	(0.442)
Memo:							
Two-year Min. Wage Effect†	0.009	–0.007	–0.008	0.039	0.002	0.056	0.090
P-Value	[0.603]	[0.720]	[0.851]	[0.061]	[0.896]	[0.023]	[0.007]
Adjusted R^2	0.873	0.848	0.843	0.872	0.854	0.589	0.737
	Panel B: Common Factors Model. Bai (2009)						
Pct. Chg. Min. Wage (t)	0.022**	0.014	0.011	0.026*	0.020**	0.039***	0.115***
	(0.009)	(0.008)	(0.024)	(0.014)	(0.009)	(0.012)	(0.029)
Pct. Chg. Min. Wage (t-1)	–0.013	–0.010	–0.012	0.006	–0.007	0.040***	0.000
	(0.010)	(0.010)	(0.028)	(0.014)	(0.010)	(0.013)	(0.020)
Bartik Emp. Growth	0.122	0.042	1.504***	–0.025	0.067	–0.217	1.658***
	(0.227)	(0.202)	(0.406)	(0.321)	(0.155)	(0.241)	(0.397)
Memo:							
Two-year Min. Wage Effect†	0.008	0.004	–0.001	0.032	0.012	0.079	0.115
P-Value	[0.545]	[0.787]	[0.982]	[0.162]	[0.453]	[0.000]	[0.003]
Observations	528	528	528	528	528	528	528

Notes: The estimates in Panel A are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \lambda_l \times \nu\_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in nominal consumption growth for the category noted at the top of each column, and l denotes a census region. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as region × year fixed effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. The estimates in Panel B are based on Bai's (2009) estimator: $\Delta y^k_{i,t} = \lambda'_i F_t + \sum_{j=0}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, using four common factors. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

TABLE A.11: Minimum Wage Changes and Real Consumption. Further Robustness Analysis

	(1) Real PCE	(2) Real Core PCE	(3) Dur	(4) Serv	(5) Food at Home	(6) Food Away
	PANEL A: REGION × YEAR FIXED EFFECTS AND CPI-MSA FIXED EFFECTS					
Pct. Chg. Min. Wage (t)	0.010	–0.003	0.037	–0.005	0.046***	0.060***
	(0.011)	(0.015)	(0.032)	(0.016)	(0.014)	(0.015)
L.Pct. Chg. Min. Wage (t)	–0.033**	–0.038***	–0.067***	–0.030*	0.019	–0.020
	(0.013)	(0.012)	(0.023)	(0.015)	(0.023)	(0.034)
Bartik Emp. Growth	–0.128	–0.123	1.747**	–0.394	0.716	–0.353
	(0.352)	(0.427)	(0.669)	(0.460)	(0.485)	(0.492)
Memo:						
Two-year Min. Wage Effect†	–0.023	–0.040	–0.030	–0.035	0.065	0.040
P-Value	[0.278]	[0.101]	[0.505]	[0.205]	[0.018]	[0.345]
Adjusted R^2	0.756	0.741	0.801	0.600	0.503	0.666
	PANEL B: COMMON FACTORS MODEL. BAI (2009)					
Pct. Chg. Min. Wage (t)	0.018*	0.021	–0.007	0.034**	0.040**	0.064**
	(0.010)	(0.014)	(0.035)	(0.013)	(0.016)	(0.031)
Pct. Chg. Min. Wage (t-1)	0.008	0.012	–0.081***	0.013	0.021	0.005
	(0.013)	(0.012)	(0.027)	(0.013)	(0.019)	(0.025)
Bartik Emp. Growth	0.655**	0.999***	0.399	0.680*	–0.020	1.661***
	(0.288)	(0.252)	(0.651)	(0.349)	(0.245)	(0.339)
Memo:						
Two-year Min. Wage Effect†	0.026	0.033	–0.088	0.047	0.061	0.069
P-Value	[0.148]	[0.088]	[0.094]	[0.020]	[0.007]	[0.057]
Observations	528	528	528	528	528	528

Notes: The estimates in Panel A are based on the baseline equation $\Delta y_{i,t}^k = \alpha_i + \lambda_l \times \nu_t + \sum_{j=0}^{1} \beta(j) \Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is the percent change in real consumption growth for the category noted at the top of each column, and l denotes a census region. The annual data cover 1999–2017. The estimates include location (CPI MSA) fixed effects as well as region × year fixed effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. The estimates in Panel B are based on Bai's (2009) estimator: $\Delta y_{i,t}^k = \lambda_i' F_t + \sum_{j=0}^{1} \beta(j) \Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, using four common factors. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

CPI Results Using All Available Data

Table A.12: Minimum Wage Changes and Inflation. Full Sample

	(1) All	(2) All x Energy	(3) Core	(4) Dur	(5) Nondur	(6) Serv	(7) Food at Home	(8) Food Away
Pct. Chg. Min. Wage (t)	0.021***	0.021**	0.019**	0.002	0.014*	0.026**	0.008	0.054***
	(0.007)	(0.008)	(0.009)	(0.010)	(0.007)	(0.010)	(0.013)	(0.013)
Pct. Chg. Min. Wage (t-1)	0.011	0.012	0.017	0.024*	0.002	0.012	–0.020	0.015
	(0.010)	(0.010)	(0.012)	(0.013)	(0.010)	(0.013)	(0.012)	(0.013)
Memo:								
Two-year Min. Wage Effect†	0.032	0.033	0.036	0.026	0.015	0.038	–0.011	0.069
P-Value	[0.026]	[0.018]	[0.024]	[0.130]	[0.274]	[0.042]	[0.457]	[0.001]
Observations	867	867	867	867	867	867	867	867
Adjusted R^2	0.675	0.577	0.548	0.670	0.887	0.427	0.681	0.295

Notes: The estimates are based on the baseline equation $\Delta y^k_{i,t} = \alpha_i + \nu_t + \sum_{j=-1}^{1} \beta(j)\Delta w_{i,t-j} + \eta x_{i,t} + e_{i,t}$, where the dependent variable is inflation (price growth) for the CPI category indicated at the top of each column. The annual data cover 1983–2017. The estimates include location (CPI MSA) fixed effects as well as year effects. The percent change in the minimum wage when a CPI MSA spans different states is calculated based on the average (population-weighted) minimum wage in each location and year as discussed in the text. † Cumulative effect of the minimum wage change measured over two years (sum of contemporaneous and lagged effects). Standard errors clustered by CPI MSA are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.