State Minimum Wage Rates and the Location of New Business: Evidence from a Refined Border Approach

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[1] I would like to thank Stuart Rosenthal, Gary Engelhardt, Jeff Kubik and Thomas Kniesner for their comments and suggestions. All remaining errors are my own.

Abstract

This paper examines the degree to which changes in state minimum wage rates between 2005 and 2006 affect the state in which entrepreneurs choose to locate their businesses. Using GIS software, the analysis focuses on activity within one mile of state borders and utilizes two levels of differencing to identify effects, cross-border differences and differences between the two sample years. The analysis also allows for differences in impacts across different one-digit industries. The difference-in-differences methodology in conjunction with a border approach controls for unobserved area characteristics that would otherwise confound the impact of minimum wage rates. Controlling for unobserved factors has been a central challenge in previous research on the minimum wage, and has also hampered prior efforts to identify the impacts of local business policy on business location decisions.

Results indicate that an increase in the state minimum wage has a small negative impact on new business activity when pooling all industries together. Further analysis reveals substantial differences in the sensitivity to state minimum wage across one-digit industry groups: minimum wage effects are most pronounced negative impacts in manufacturing and retail. Results also indicate that sensitivity to the minimum wage increases with the degree to which an industry relies on workers with less than a high school education: the response of new business activity to a one dollar increase in the minimum wage is 7 percentage points higher among two-digit industries most reliant on low-skill workers as compared to industries that employ few workers with a limited education. Finally, for eating and drinking establishments -- an industry that has been the focus of several recent minimum wage studies -- a one dollar increase in the state minimum wage results in a 9 percent decrease in new business activity. These findings indicate that close to state borders, entrepreneurs are responsive to differences in the minimum wage changes, and especially so in industries that rely heavily on low-skilled workers.

Key words: Minimum wage, spatial differencing, borders

JEL classification: R38, J23, O18

I. Introduction

Between the 1997 and 2007 federal minimum wage increases, there was a continual decrease in the real federal wage as price levels increased while the nominal minimum wage remained the same. As a result, states took a more prominent role in the minimum wage landscape, as depicted by 23 states increasing their minimum wage above the federal minimum wage during that time period. Figure 1 shows that the number of states that increased their minimum wage has risen gradually between 1998 and 2006. This trend seems persistent for the foreseeable future with six states proposing a minimum wage increase on their ballots in 2007. [2] With state minimum wage policy playing such a prominent role in state legislation, it is important to understand the implications of these policies on an area's economic vitality.

During this time, local governments have heightened their focus on developing and maintaining their local economy, as evident by the expansion in state and local government economic development policies. See Bartik (1991) for an overview of such policies; Wasylenko (1997) and Bartik (2005) offer further discussion. The state minimum wage is another potential tool that state and local policy makers can use to revitalize and expand their area's local economy. This paper uses variation in state minimum wages from 2005 and 2006 to determine the impact of state minimum wage increases on the location decisions of new business. Neumark, Zhang, and Wall (2005) find that "new firms contribute substantially to job creation". With new firms playing such a vital role in determining the economic wellbeing of an area, it is important to have a clear understanding of the impact of the minimum wage on new business location decisions.

[2] Source: the National Conference of State Legislatures, National Restaurant Association, and U.S. Dept. of Labor.

Although a vast literature exists devoted solely to the understanding of the minimum wage's effect on employment, see Card and Krueger (1995) and Neumark and Wascher (2007) for a complete review, there is relatively little empirical evidence in the literature on the minimum wage's effect on new establishment location decisions. Traditionally, the literature has focused on specific sections of the labor force (i.e. youth and minorities) to find an effect of the minimum wage on employment.[3] This paper continues the previous literature's trend of focusing on those most affected by concentrating spatially on the geographic areas that are most likely to be affected by minimum wage increases.

This paper attempts to circumvent the difficulties of controlling for unobserved factors that have plagued the previous literature by using aggregated establishment level data with a unique Geographic Information Systems (GIS) border process to determine the amount of new establishment births and new establishment employment in areas within one-mile of a state border. In this regard, the paper expands on previous border studies by Holmes (1998), Black (1999), Pence (2006) and others. Geographic areas near state borders are most likely to be affected by the minimum wage because they have to compete with areas on the other side of the border for new businesses looking to locate in the general area. New businesses are willing to locate in either area because these areas have similar area characteristics, such as proximity to natural resources, climate, and share the same labor pool. Therefore, studying areas that compete with one another along a state border that experience different minimum wage changes gives the optimal chance to isolate and detect a minimum wage impact.

Two primary challenges arise when studying how the minimum wage affects the amount of new business in an area. First, it is difficult to control for heterogeneous area characteristics.

[3] See Pabilonia (2002), who studies the minimum wage effect on the employment of 14 to 16 year old, for an example of a study that focuses on workers most directly affected.

An entrepreneur faces a large number of heterogeneous areas to choose from when deciding the location of the establishment. These area characteristics can greatly impact an entrepreneur's location decision. Unfortunately, they are often unobserved and potentially correlated with other explanatory variables, which if not controlled for leads to omitted variable bias. This paper uses a refined border methodology that studies narrow spatially scoped geographic areas that reside next to state borders. Using GIS software, I create pairs of one-mile wide adjoining geographic areas that reside in different states. I then use these areas as treatment and control areas to control for unobserved heterogeneous area characteristics, which the previous literature has had difficulty addressing. The second challenge is the potential endogeneity associated with state minimum wages changes. This paper uses a difference-in-difference methodology in conjunction with the border methodology to compare two neighboring uniform geographic areas with similar area characteristics before and after a state minimum wage increase in one of the areas. This approach allows me to isolate the impact of a state's minimum wage by controlling for heterogeneous area characteristics, which may influence an area's decision to change its minimum wage policy, such as the state of the local economy.

Using the Marketplace file from Dun and Bradstreet for 2006 and 2007, this paper's general finding is that state minimum wage increases do have an impact on where new businesses locate close to state borders. The first evidence comes from the pooling of all two-digit industries, which finds a small decrease in new business activity in an area due to an increase in the minimum wage relative to a neighboring area that was not subject to a minimum wage increase. To understand whether there is variability by industry of the minimum wage's impact on business location decisions, I then present results for different one-digit industry categories. I find that minimum wage increases have no effect on the mining and finance,

insurance, and real estate (FIRE) one-digit industries, while finding evidence that a state minimum wage increase leads to roughly a 5% and 8% decrease in new business activity in the manufacturing and retail one-digit industries, respectively. A concern facing this paper is how to control for any time varying area specific attributes, such as other state policy changes, which may be correlated with a state minimum wage change and confound my estimates. To address this problem and to further investigate which types of businesses are most affected by minimum wage policy, I group businesses in different two-digit industries by the industry's propensity to employ workers who have obtained less than a high school education.

By comparing different groups of industries based on their reliance on low-skilled workers, I can better control for time-varying area attributes that are correlated with an area receiving a minimum wage increase. This is derived from comparing the minimum wage's impact between industries that both were affected by the time varying area attributes, i.e. other state policies. The main finding from this work is that new businesses in industries that employ a higher proportion of less than high school educated workers are more likely to locate away from area that increased their minimum wage. Lastly, the minimum wage literature has focused on the restaurant industry due to the high proportion of workers that are paid the minimum wage, such as Card and Krueger (1994), Neumark and Wascher (1995), Singell and Terborg (2007) and others. Looking specifically at eating and drinking places industry (the restaurant industry), this paper finds a 9% decrease in new establishment arrivals from a $1 increase in the minimum wage, which is significant at the 5% level. Although this effect is larger than what previous studies have found, this result can be thought of as an upper bound because I am measuring the effect at the border, which is the geographic area most likely to be affected. More specifically, it is considered an upper bound because an establishment has the advantage of being able to locate

on the lower minimum wage side without losing their desired market area. In contrast, a business wanting to locate in the middle of a large state cannot move to another state without losing their desired location, labor pool and customer base. Therefore, these border estimates are an upper bound and should not be generalized as the impact of the minimum wage on new business in the entire state.

The remainder of the paper begins with a discussion of the related literature and how this paper extends the literature. I follow this with a methodology section that gives a description of the identification strategy and econometric specification. Next, I describe the data used for estimating the effect of state minimum wages on establishment location decision. In the following section estimation results are provided. The final section concludes.

II. Related Literature

Although this study focuses on the impact of the minimum wage on new business location, I draw upon past literature which explores the employment effect of the minimum wage. Before the 1990s there was a consensus in the literature, summarized by Brown et al. (1982), that the minimum wage negatively impacts employment. This view was contested by a body of work, reviewed by Card and Krueger (1995), showing evidence ranging from no effect at all to a positive effect on employment from the minimum wage. Since then, there has been a persistent debate in this literature on the minimum wage's impact on employment

In an attempt to isolate the true impact of the minimum wage on employment, there has been a trend in the literature toward more precision in the geographic scope of analysis. One of the first papers to use a spatial component to find a compatible control area is Card and Krueger (1994). This paper studies the impact of the New Jersey state minimum wage increase on

businesses in the fast-food industry, by using firm-level data with a natural experiment methodology that compares employment growth at stores in New Jersey and eastern Pennsylvania, where there was no change in the state minimum wage. Fast-food stores in eastern Pennsylvania are argued to be valid control stores due to the relative geographic proximity to New Jersey and the similar employment patterns of both areas. They find evidence that the New Jersey minimum wage increase actually increased employment and give other alternative models that could explain their positive employment effects. The authors also study the minimum wage's effect on prices and find some evidence that increases in minimum wages lead to increases in fast-food prices.

The minimum wage literature also began using aggregated businesses data for select industries at a more refined geographic scope, such as county-level data. An example of this is Kim and Taylor (1995), who use County Business Patterns data to study the effect of California's 1988 minimum wage increase on employment growth in the retail trade industry. The authors find support for the conventional theory on minimum wage by using inter-county variation in the wage change. The authors find a negative wage elasticity on employment of roughly 0.7.

Orazem and Mattila (2002) is one of the few recent papers to study the impact of minimum wage on the number and size of firms using a county-level data set. The authors use Unemployment Insurance records and census data to analyze how the Iowa minimum wage increases of the early 1990's impacted the number and size of firms in retail and nonprofessional service industries. Their approach is to study how the number of firms (or employment) in county-industry cells are impacted by changes in the minimum wage relative to the county-industry wage levels while controlling for such things as national industry wage and employment

levels. They find that a state minimum wage increase adversely impacts the number of firms while finding that firm size rises due to the increase. Specifically, they estimate that an increase in the state minimum wage of ten percent leads to a 2.5 percent decrease in the number of firms over a year.

Although the minimum wage literature on employment has made progress on utilizing geography and smaller spatial employment data, the literature still struggles to adequately control for heterogeneous area characteristics. This paper attempts to address the issue of controlling for area characteristics at a smaller geographic scale by using a border approach to create narrow pairs of geographic areas on opposite sides of state borders.

Holmes (1998) was one of the first to pioneer the border approach to investigate how state policies impact the location of industry. He specifically focuses on how manufacturing's share of total employment and the growth rates in manufacturing employment from 1947 to 1992 changes when you move from an "antibusiness" state to a "probusiness" state.[4] His paper finds that on average, when one crosses from an "antibusiness" state into a "probusiness" state, the percent of total employment in manufacturing increases by approximately one-third as well as finding significant differences in growth rates for manufacturing.

Duranton, Gobillon and Overman (2006) extend the border literature by using British establishment level data from 1984 to 1989 in a panel framework to study the effect of a British business property tax on business location and growth. An important contribution of this paper is the method in which it controls for unobserved site characteristics, heterogeneous establishments, and the endogeneity of taxation. By comparing establishments near each other but on opposite sides of jurisdictional borders in a panel framework, the authors are able to

[4] Holmes (1998) defines a "probusiness" state as a state with right-to-work laws and an "antibusiness" state as a state without right-to-work laws.

control for both time-varying and time-invariant unobserved site characteristics, as well as any unobserved time-invariant establishment characteristics through establishment fixed-effects. The authors find that an increase in local taxation has an adverse effect on employment but find no effect on entry for English manufacturing establishments.

The only paper in the recent minimum wage literature to incorporate a border approach is Dube, Lester and Reich (2007), which uses a spatial approach by using county-level data to create county pairs across state borders in order to study minimum wage effects on employment. The authors use restaurant earnings and employment at the county-level from 1990 to 2006 to address the potential sources of inconsistencies in the findings between national and local studies in the minimum wage literature on employment. By comparing contiguous county pairs that reside on opposite sides of state borders with different minimum wages in the entire U.S., the authors are better able to control for spatial trends in employment that are correlated with minimum wages, which if not controlled for cause an overstatement of precision. The authors find that unobserved heterogeneities drive the negative elasticities that they find in their national fixed-effects regressions, while they find no employment effects from minimum wage changes in their local regressions.

Although Dube et.al. make great strides to narrow the spatial scope of the literature, which strengthens its ability to control for spatial heterogeneity, it uses counties to create their pairs of areas that reside on the border. However, counties may not be the best geographic units of observations to control for heterogeneous area characteristics due to the fact that they are quite large in size and are heterogeneously drawn, causing them to vary in size and distance to the state border. Therefore, I continue their effort to narrow the spatial scope of the analysis by using GIS techniques to create narrow borders on either side of a state border. From these border

strips, I am able to create pairs of adjacent uniform areas along state borders that are fine enough to control for narrowly spatially scoped heterogeneous area characteristics. This advancement is particularly important to this paper due to the importance of controlling for heterogeneous area characteristics when studying the determinants of new business location decisions.

To understand the importance of creating areas that are narrowly spatially scoped enough to control for area characteristics, I draw upon the agglomeration literature. There are two primary findings that come from the agglomeration literature that relate to my paper. First, work such as Rosenthal and Strange (2005) show that localization and urbanization agglomeration economies are important determinants of new business location decisions, which is the focus of my paper. This literature demonstrates that it is vital for any research intending to study the determinants of business location decisions to control for any area differences in the existing business environment. Second, the effect of these agglomeration economies on new business location decisions may attenuate quickly over a few miles (Rosenthal and Strange 2003) or even a mile or less (Arzaghi and Henderson 2007). This literature gives evidence that any analysis of the determinants of new business location should use a narrow spatial scope and is the main basis for studying how the state minimum wage impacts new business location decisions within a one-mile region of state borders.

One of the first papers to show how spatially scoped the impact of the existing business environment is on where new businesses locate is Rosenthal and Strange (2003). The authors examine the geographic extent of agglomeration externalities in software, food products, apparel, printing and publishing, fabricated metal, and machinery industries, by using Dun and Bradstreet data with mapping software that create concentric rings at different distances. They estimate how existing businesses in their own industry (localization) and in all other industries

(urbanization) in different distance rings impact the amount of new business births and new business employment that arrives in an area. Their findings indicate that localization economies dissipate quickly over the first few miles and then dissipate more slowly thereafter.

Arzaghi and Henderson (2007) study the impact of having close neighbors on productivity and profitability in the advertising agency industry in Manhattan. They use census tract data for Manhattan that distinguishes locations at 250 meter increments. Their study finds that businesses in the advertising industry are willing to incur higher rent costs in order to locate closer to other businesses in their own industry at a micro spatial level. Specifically, they find that there are strong economies of scale that attenuate quickly to the point that the benefits are gone by 750 meters. Both of these papers demonstrate the importance of controlling for area characteristics, such as agglomeration economies, at very precise spatial scopes.

My paper also contributes to the existing literature by examining the impact of state and local government economic development policy. Policies analyzed in this literature include direct economic development policies, such as property tax abatement that go directly to businesses, and indirect economic development polices, such as polices related to public school improvement programs. A fundamental question debated in this literature is the degree to which government economic policies impact the economic vitality of a region. Bartik (1991) reviews this literature and gives evidence that economic development policies can significantly impact the economic growth of a region. The results of my paper support Bartik's findings; showing that new firms are particularly responsive to government policies in areas along state borders, where firms have a choice between which government policies they face.

III. Method of Identification

In this section, I explain the method I use to identify the effect of state minimum wage changes on the location decisions of new businesses. Using a GIS process, explained in the next section, I create uniform geographic area pairs along state borders where there is an increase in the minimum wage on one side of the border. This process allows me to use these areas along the border that did not receive a minimum wage increase as a comparison group for those areas just on the other side of the border that did receive a minimum wage increase.

First, I need to define some terminology that is used throughout the rest of the paper. As seen in figure 2, I define a border-area as an area that resides in a single state and is adjacent to a state border. Two border-areas adjacent to one another on opposite sides of a state border are defined as a border-area pair.

Before discussing the specific methodology used, it helps to discuss the different determinants of location decisions of new businesses, such as area characteristics, that need to be controlled for in order to isolate the minimum wage's true effect. These determinants can be categorized into three groups; time-varying determinants that impact all areas similarly, time-invariant area characteristic effects, and area specific determinants that vary over time. These effects in a regression form are as follows:

$$Y_{jt} = \alpha + \beta MW_{jt} + \gamma_{j,} + \mu_t + \theta_{jt} + u_{jt} \qquad (1)$$

where *j* and *t* index area and time respectively, MW is the minimum wage parameter, γ is a full set of area fixed-effects that control for time-invariant area characteristic effects, μ is a time fixed-effect that take into account time-varying effects that impact all areas, θ_{it} represents time-varying area specific determinants of new business, and u is a disturbance term.

In an ideal world, I would have all possible data to explicitly control for γ_i, μ_t, and θ_{it}. However, since no such data exist, I use a difference-in-differences methodology in conjunction with a border approach to control for both unobserved time-invariant factors and time-varying factors that affect both the treatment and control areas the same.

My strategy is to compare new business outcomes between border areas that receive an increase in the minimum wage and contiguous border areas that did not receive a minimum wage increase. I then compare these differences in new business activity between the two areas before and after state minimum wage increases in 2006. This differencing specification identifies the effect of a state minimum wage increase from time-invariant effects and any time-varying effects that affect both contiguous border areas the same. The data are constructed so that each observation is a border-area pair *i* and the variables used in the regressions are in the following form:

$$Y_i = (Y_{MW,2006} - Y_{nonMW,2006}) - (Y_{MW,2005} - Y_{nonMW,2005}) \qquad (2)$$

where MW indicates the border-area that received the state minimum wage increase and nonMW represents the adjacent border-area that did not receive a state minimum wage increase.

The differencing methodology helps control for unobserved factors that may otherwise be driving the correlation between the minimum wage changes and the location of new establishments. By first differencing across border areas, I eliminate any area characteristics common to the border-area pair that could affect new business location decisions. An example of these area characteristics common between contiguous border-areas is access to production inputs such as the local labor market, energy inputs and raw materials. This difference also controls for time-varying determinants that impact all areas similarly. For example, an economic shock of a major local employer relocating away from the area can be controlled for when

differencing across border-areas, as long as the shock did not affect the border-area disparately. This differencing is equivalent to including the time fixed-effect μ_t.

By differencing over time, between 2005 and 2006, I eliminate any border-area time-invariant effects that could impact the location decision of new businesses. This differencing is equivalent to the area fixed-effect, γ_j, which controls for any disparities in area attributes that are unique to a specific area but do not change over time, such as an area having access to a water front. Another advantage to differencing over time is that it aids in controlling for disparity in services between two areas assuming these disparities do not change over time. For instance, I can control for when one state tends to spend more on road maintenance than an adjacent state by assuming that states do not drastically change their expenditures on services in the years of my study. To minimize changes in state expenditures that could influence the location decisions of firms, I chose a narrow time frame of one year.

This difference-in-differences approach helps to control for the endogeneity issue related to the implementation of the state minimum wage. If an area's preference for minimum wages does not change from 2005 to 2006, then differencing over time will help to control for any differences in preferences for minimum wages. However, since people's preferences for minimum wages tend to be correlated with area characteristics, such as the state of the local economy, which could possibly vary over time, a weakness of using the difference-in-difference methodology by itself is that it cannot account for time-varying area attributes that could be biasing estimates.

The border approach has a nice way of controlling for these unobserved time-varying area characteristics, represented by θ_{jt}, by utilizing the fact that area characteristics are spatially correlated. By comparing two adjacent border-areas that extend one-mile into the state from the

border, I can utilize the spatial correlation of area characteristics minimizing any area specific changes that only impact one area in the pair of border-areas. My identifying assumption is that any area-specific effects that impact new business activity change smoothly across space. This assumption becomes more realistic the more narrow the spatial scope of analysis. By narrowing the spatial scope to only within one mile of the state border, the border approach can better isolate the minimum wage effect from these area specific effects to give unbiased estimates of the minimum wage increases. This is important since surveys in the state and local finance literature have shown that firms care about many business factors and government policies besides the state minimum wage policy when deciding where to locate their business, such as access to a customer market, access to the right kind of workers (agglomeration economies), and access to energy or other inputs. The border approach is able to control for these factors of business location decision as well as idiosyncratic factors such as an entrepreneur's own personal interest in a particular area because both the area that received the minimum wage increase and the comparison area are adjacent and have the same access to customer and input markets.

Another concern is if states that increase their minimum wage are also enacting other state policies that may affect new establishment location decisions. Not controlling for this could possible bias my estimates either positively or negatively. For instance, states may be enacting "probusiness" policies along with a minimum wage increase to counteract any negative effects of the minimum wage policy. This would cause an underestimate of minimum wage's effect on new business location decisions. On the other hand, there could be an overestimation of minimum wage's impact if more "antibusinesses" states are increasing their minimum wage along with other "antibusiness" policies.

To address this concern, I want to compare two groups of businesses that are both affected similarly by other state policies but have different responses to a minimum wage increase. Therefore, I extend the differencing methodology by comparing businesses in industries that hire a relatively high proportion of low-skilled workers and are more sensitive to minimum wage policy with businesses in industries that hire a relatively low proportion of low-skilled workers and are less sensitive to minimum wage policy. By separating businesses based on their industry's reliance on low-skilled workers, I create groups of businesses that equally received other state policies but are differentially affected by minimum wage policy. Assuming that any time-varying border-area specific attributes, such as other new state policies, do not differentially affect industries that have a high reliance of low-skilled workers, then this methodology allows me to isolate the minimum wage increase from other state policy changes.

To study the minimum wage's impact on new establishment location decisions I analyze two dependent variables: the number of establishment births (B) and new-establishment employment (N). The estimating equations used in the regressions to determine the effect of state minimum wage increases on new establishment location, is:

$$B_{i,n} = \alpha + \beta MW_i + X'_n\delta + u \qquad (3)$$

$$N_{i,n} = \alpha + \beta MW_i + X'_n\delta + u \qquad (4)$$

where *i* indexes a pair of border-areas, *n* indexes the industry at the two digit SIC level, X is a vector of industry dummy variables, and MW is the minimum wage variable. Both dependent variables and the minimum wage variables are differenced as shown in equation 2. Each observation is a border pair (two adjacent areas on opposite sides of a state border) in a given two-digit industry.

The measure of new business activity, either new business births or new business

employment, in a given border is expressed as ratios. The first outcome variable, births (B), is expressed as the percent of the total number of new establishment births that located in the border-areas in the pair at time period *t* that located in a given border-area (either the minimum or non minimum wage increased side) such as $\frac{B_{1,t}}{B_{1,t} + B_{2,t}}$. Likewise the second outcome variable, N, is expressed as the percent of the total amount of new establishment employment in the border-area pair *i* at time period *t* that located in a given border-area such as $\frac{N_{1,t}}{N_{1,t} + N_{2,t}}$. I measure new business activity in this ratio format to reinforce the idea that each pair of border areas are competing to attract new business startups in their area. Therefore, I calculate what percent of the total new business activity each border-area is able to attract before the minimum wage increase and see how this distribution changes after the minimum wage increases. This format has the added benefit of dealing with rural border-area pairs that have zero business activity.

IV. Data Description

A. Establishment Data

The data source used to determine the amount of new business activity that enters an area comes from the Marketplace file of the Dun and Bradstreet (D&B) Marketplace database.[5] To study the effect of minimum wage increases that occurred between 2005 and 2006 on new business one year or less in age, I use the first quarter data from 2006 and 2007.[6] These data contain a wealth of establishment information, including employment, sales, years of service, the

[5] Examples of other studies that use this data are Rosenthal and Strange (2001) and Rosenthal and Strange (2003)
[6] Although the D&B does not contain all business activity in the U. S., the omissions from the data are sufficiently random that the data is considered representative of the spatial distribution of the business activity in the U. S.

location at the zip code level, and the two-digit Standard Industrial Classification (SIC) code of the establishments. [7]

The D&B data used in this paper are aggregated to the zip code level.[8] I map the zip code level data to census tracts using a zip code to census tract correspondence, created by the author, in order to determine the amount of new business activity in each census tract. This correspondence determines the percent of each zip code that lies in a given census tract and assigns that percent of zip code employment to the census tract. [9] This census tract map is then used in the creation of border-areas, which is explained later in this section. From the D&B data, I create the two measures of new business activity, new establishment births, and new establishment employment. An establishment is deemed a new establishment when the years of service for an establishment total one year or less. Therefore, a new establishment birth is considered an establishment that has one or fewer years of service and the employment at these new establishments are considered new establishment employment.

B. GIS Process to Create Comparable Border-Area Pairs

A requirement of the border methodology is to compare pairs of geographic areas across jurisdictional boundaries. Ideally, I would be able to create these pairs by matching up identical existing geographic areas across state borders. However, in reality these existing geographic areas (i.e. counties or census tracts) are quite heterogeneous causing them to be neither perfectly positioned across a state border from one another nor identical in size or shape. Consequently,

[7] SIC is a four digit industry classification system created by the United States government and used by such government agencies as the Security Exchange Commission.

[8] The zip code level data is a more precise spatial data set than county spatial data.

[9] To use this correspondence, I assume that the amount of business activity in a zip code is distributed uniformly across the zip code. This is a standard assumption in the literature.

this causes existing geographic areas to be different distances from each other across jurisdictional borders and subsequently less comparable.

A further contribution of this paper is to use GIS software to create approximately uniform geographic areas directly adjacent to each other on either side of a state border. This advancement makes the border methodology more applicable because it creates more compatible areas to compare across state borders. The first step in this process is to create one-mile borders around every state's border. Ideally, the next step would be to cut the borders up every few miles to create the geographic area units, however state boarders are erratically drawn at some points causing difficulty for the GIS software to make these geographic border-area units. A unique solution to this problem is to lay a five mile by five mile grid over the entire United States, which creates pairs of areas on either side of the border by using the cells that fall on top of the state border to cut the one-mile border widths around the state border. This process creates two geographic areas on opposite sides of a state border that have a distance no farther than one mile from the state border and have a length no greater than five miles. I define each of these geographic areas as border-areas and each matched pair of border-areas is called a border-area pair.

Figure 3 is a visual example of this process, which depicts the border-areas that are created for the New York and Pennsylvania border. This state border gives a good representation of the border-area pairs because it shows how this process deals with both straight borders like in the middle of the state border and how the process deals with more jagged state borders like the part of the border on the right, closer to New York City. Also, this figure 3 highlights the importance of creating five mile wide border-area pairs because the minimum wage impact may be less in border-area pairs located closer to New York City due to the high

cost of living compared to rural border-area pairs in the middle of the state border. A problem with this process is that some cells will be randomly placed in such a way that causes the areas of the two sides to be different. To correct for this, I modify the establishment variables to be establishment births per square mile and new establishment employment per square mile. I then determine what proportions of census tracts are located in each newly created border-area. [10] From there I determine how many new business births and how much new employment exist in each border-area by multiplying the percent of each census tract that is located in the border-area by the amount of new business births and employment in the given census tract. The end result of the GIS process is a dataset with the amount of new business activity in each border-area.

C. IPUMS Data

The final data set used in this paper comes from the Integrated Public Use Microdata Series (IPUMS). The IPUMS dataset is a population data set that consists of a broad range of information about individuals and households such as individual's work and education characteristics. I use the 1% year 2000 sample to determine the educational attainment for each two-digit industry. I can then use this information to determine which two-digit SICs are most likely to be affected by minimum wage changes. To control for any border-area specific time varying attributes that may be correlated with the minimum wage increases, such as other state policies affecting new establishment location decisions, I compare new business in high probability of minimum wage impact industries with low probability of minimum wage impact industries.

[10] Again an assumption that is required with aggregated geographic level data is that the amount of employment in a census tract is evenly distributed across the census tracts.

To determine a two-digit SIC's likelihood of impact from a minimum wage increase, I use the IPUMS data set to calculate the proportion of an industry's workforce with less than a high school education. Using the proportion of an industry's workforce that has less than a high school education is a good proxy for the proportion of an industry that faces a binding minimum wage. The person level IPUMS dataset includes the educational attainment of the individual, the industry that the individual is currently working in or last worked in and hours worked. However, since IPUMS uses the North American Industrial Classification System (NAICS) and the Duns and Bradstreet data uses SIC classification system, I had to use a correspondence between NAICS and SIC.[11] I calculate the proportion of the individuals working in each of the 80 two-digit industries that attained less than a high school education. Then I categorize an industry with a relatively high propensity to employ low educated workers as an industry that would expect a larger impact of a minimum wage increase, while an industry with a relatively low propensity to employ low educated workers as an industry that would expect a smaller impact of a minimum wage increase.

V. Results

A. All Industries Pooled Together Results

Table 1a presents results from an econometric analysis that pools all two-digit industries together in order to estimate the minimum wage's impact on new establishment births in all industries. First, I construct the dependent variable to be a measure of the ratio of the number of new establishment births that locate in a border-area divided by the total number of new establishments births that locate in that border-area's pair. To understand the rationale for using

[11] I use the NAICS-SIC correspondence provided by the U.S. Census Bureau's website found at http://www.census.gov/epcd/www/naicstab.htm .

the final difference-in-differences specification, I start with the simplest specification and work up to the final specification.

Columns 1 and 2 in table 1a present results from the simplest specification, which regresses the state minimum wage (real in dollars) in a given year on the percent of new establishment births that arrived in "side-one" of the border-area pair.[12] The minimum wage coefficients in both years are negative and statistically insignificant for new establishment births. Because of the construction of the data, a regression of just a constant should result in a coefficient close to .5 if the border-area chosen to be "side-one" was completely random. However, since I am controlling for the minimum wage and include industry fixed-effects, the coefficients are close to but not exactly .5. Using the count of new establishment births is not the only way to measure the amount of new business activity establishing in an area. The size of these new establishments, as measured by the number of employees, is also an important measure of new business activity because it takes into account areas that received a small number of establishment births that are relatively large. The Marketplace file of the Dun and Bradstreet allows for this flexibility, as it includes information on the number of firms and the number of employees at those firms.

Table 1b presents results using the border-area's share of all new establishment employment in a border-area as the dependent variable. Columns 1 and 2 of table 1b display the same simplified specification and find results similar to the birth regressions of negative and insignificant effects. However, there are many potential problems with these regressions, such as unobserved area characteristics, that are potentially correlated with the minimum wage. To deal with this omitted variable bias, I next move to a single difference specification, which

[12] To prevent implicitly doubling the number of observations by including both sides of a border-pair, I include only one border-area for every border-pair for the regressions in column (1) and (2) of Table 2a and 2b. I choose the border-area whose state increases its minimum wage in 2006.

differences between adjacent border-areas in a given border-area pair that reside on opposite sides of a state border. This single difference helps to control for unobserved area characteristics that may be correlated with a border-area's minimum wage.

The single difference regression results for new establishment births, in 2005 and 2006, are present in columns 3 and 4 of Table 1a. Both years find a small negative relationship between the difference in state minimum wages and differences in the amount of new birth activity, however only 2006 has statistical significance.[13] Again, due to the construction of the dataset, a regression of only the constant should result in a constant close to zero. When including the minimum wage variable and industry fixed-effects, I find estimates of -.0087 and -.032 for 2005 and 2006 respectfully. I find similar results for new establishment employment for the same specification. However, these regressions may still be suffering from omitted variable bias resulting from time-invariant area attributes. To further control for such problems, I move to a double difference specification, which first differences across border-areas in each border-area pair and then differences over time (2006 to 2005).

My strategy compares new business activity in border-areas that extend one mile into the state from the border that received a state minimum wage increase with adjacent areas that extend one mile into the state from the border that did not receive a state minimum wage increase and see how this difference between border-areas changed before and after the minimum wage increase. The variables used in each regression are of the form described in section III, to reflect the differencing methodology. The regression results in column 5 of table 1a show that increases in state minimum wages have a negative impact on the number of new firms that chose to locate in state minimum wage increased areas compared to contiguous areas

[13] Standard errors are clustered at the state border pair, due to the fact that border-area pairs that reside along the same state border do not have independent and identically-distributed error terms.

that did not have an increase in their state minimum wage. The coefficient on the state minimum wage variable shows that on average, border-areas receiving a state minimum wage increase of $1 had a 3.41 percent decrease in new establishment births. Likewise, column 5 of table 1b shows a coefficient on the state minimum wage variable of -.0343 meaning state minimum wage increase of $1 also leads to a decrease of 3.43 percent in new firm employment. Both of these effects are statistically different from zero at the five percent level.

These results should be viewed as a net border effect and not generalized to the whole geographic area of a state. This is because the new businesses that are potentially deterred from the increase in the minimum wage may be locating just on the other side of a state border in order to access the same customer and input markets and thus, increasing the new business activity on the non-minimum wage increase areas. Therefore, the magnitude of these minimum wage effects can be viewed as an upper bound. Although I find a small impact of state minimum wage changes on new business activity when pooling all two-digit industries together, understanding how minimum wage differentially impacts new business activity in different industries is also important.

B. One-digit Industry Category Results

To investigate whether new businesses in different industries are differentially impacted by the minimum wage, I analyze how the minimum wage impacts new business activity in different one-digit (SIC) industries categories. Tables 2a and 2b present the results from the difference-in-differences specification for new establishment births and new establishment employment respectively. I run separate regressions for selected industries at the one digit SIC level with two-digit industry fixed-effects. For each regression, I cluster standard errors at the

state border pair because I expect that the amount of new business activity is correlated along a state border pair, and therefore the error term is likely to be correlated within a state border pair.[14]

Columns 1-5 in table 2a display the impact of the minimum wage on new establishment births in the mining, manufacturing, retail, FIRE, and service sector respectively. These results give distinctive evidence that minimum wage policy impacts the location decision of new firms differentially by industry. As one would expect, I find that in industries which rely more heavily on lower wage workers, such as the manufacturing, retail and service industries, experience a negative impact from minimum wage policy. Specifically, I find a $1 increase in state minimum wages lead to a decrease of 5.4% and 7.6% for both the manufacturing and retail one-digit industry categories, both of which are precisely estimated at the 5% level of significance. Column 5 shows that the service one-digit industry, which also employs low wage workers, has a decrease of 3.1% but is imprecisely estimated. I display the results for the mining and FIRE one-digit industry categories as a robustness checks.

One would anticipate that minimum wage policy should not impact mining business location decisions due to the industry's need to locate precisely where the raw materials are located. Likewise, since most employees who work in the FIRE industries earn high enough wages that any minimum wage is nonbinding, one would expect to find less of an impact from the minimum wage variable. Columns 1 and 4 of table 2a confirm that changing a state's minimum wage has no effect on the new business location of mining and FIRE businesses. Coefficients for both industries are positive and indistinguishable from zero giving evidence that minimum wage policy has disparate effects on businesses in different industries.

[14] To test the robustness of the standard errors, I also cluster at the state and find similar standard errors.

Table 2b displays regressions results on state minimum wages' effect on new establishment employment by one-digit SIC industries. These results are similar in both magnitude and precision to the results from the new establishment births regressions. Both the mining and FIRE one-digit industry categories show small insignificant positive effects, while new business employment in manufacturing and retail one-digit industries find precisely estimated negative coefficients of roughly 5% and 8%. Also, the results for minimum wage's impact on service sector's employment is roughly 3%, but is still imprecisely estimated.

However, these results are still aggregating groups of two-digit industries that may have different dependencies on low wage workers and therefore potentially differential responses to state minimum wage changes. An example of this is the manufacturing one-digit sector which includes both low-skilled employing manufacturing businesses, such as businesses in the apparel industry, and manufacturing business, such as electronic and other electrical equipment manufacturers, that employ higher skilled employees. Also, a potential problem with these double difference regressions is that there may exist time varying border-area attributes that are correlated with minimum wage increases. Specifically, I am concerned that states choosing to increase their minimum wages are also changing other state policies that influence business location decisions. To address both of these issues I want to group two-digit industries by some measure which proxies for their reliance on minimum wage workers and then compare results across these different groups of industries.

C. Results by Industry Reliance of Low Educated Workers

In an ideal world, when states raise their minimum wage they do not change any other policies that could alter a state's attractiveness to new entrepreneurs. This would allow a

researcher to completely isolate the minimum wage's effect on new business location decisions. However, since this is not true, a researcher has to be concerned with confounding the minimum wage's impact with other time-varying area attributes. This paper attempts to isolate the minimum wage effect by comparing industries with a lower reliance on minimum wage earning workers, which should not be affected by minimum wage changes, with industries with a higher reliance of minimum wage earning workers, which may be more affected by minimum wage changes. Since time-varying unobserved area characteristics, such as other state policy changes, will affect businesses in both high and low reliance industries, comparing between these two groups of industries will allow me to isolate the minimum wage effect from other state policies. The identifying assumption in this specification is that any time-varying area characteristics do not differentially affect high and low reliance industries.

To determine how reliant each two-digit industry is on minimum wage earning workers, I employ the IPUMS data set. From this data set I calculate the percent of each two-digit industry's workforce that has earned less than a high school education. I use this percent to classify industries into three categories. An industry is considered to have low reliance on minimum wage workers if less than high school educated workers consists of less than 5% of the workforce. Likewise, if less than high school educated workers are 5% to 15% of the workforce then an industry is considered to have some reliance on the minimum wage and lastly, greater than 15% is considered to have high reliance of the minimum wage. Table 3 shows that there are 30 two-digit industries with less than 5% low educated workers, 38 two-digit industries with 5% to 15% low educated workers and 12 two-digit industries with workforces that consist of more than 15% of low educated workers.

The regression results using the differencing specification that differences across border-areas and over time for each reliance group are shown in columns 1-6 of table 3. The first two columns of table 3 show that an increase in a state's minimum wage has no effect on new businesses with little reliance on low educated workers. Columns 5 and 6 of table 3 show that businesses in industries that rely most heavily on low-skilled workers decrease both new establishment births and employment by roughly 7% when the state minimum wage increases by $1. Although this effect is a net border effect and should be considered an upper bound, this effect is still quite large and statistically significant at the 1% level. Another interesting finding is that the minimum wage coefficient becomes less negative as you move from high minimum wage reliance to low minimum age reliance, which gives evidence that entrepreneurs vary how much they take into account minimum wage policy depending on their reliance on minimum wage earning workers.

D. Minimum Wage Effect on the Eating and Drinking Industry (SIC 58)

A review of the recent literature on the employment effects of a minimum wage finds a plethora of studies that focus their analysis on the restaurant industry.[15] The restaurant industry is an ideal industry to study because of its high reliance on low-skilled and therefore low wage workers. For instance, Singell and Terborg (2007) study the Eating and Drinking Industry and Hotel Industry along the Oregon-Washington border and find that the minimum wage has a greater impact on the Eating and Drinking Industry because the minimum wage is more binding in that industry. Therefore, it is important to examine specifically how the state minimum wage impacts the location decisions of eating and drinking establishments.

[15] See Card and Krueger (1995), and Neumark and Wascher (2007) for a review of this literature. An example of recent research on the restaurant industry is Singell and Terborg (2007).

To examine the eating and drinking industry specifically, I continue to use the double difference specification for both the number of new establishment births and employment that locate in a border-area compared to the adjacent border-area on the other side of the state border, over time. The regression results in tables 4a and 4b, find statistically significant negative impacts from the minimum wage on the eating and drinking industry in both new establishment births and amount of new establishment employment. The coefficients in column 5 from both tables 4a and 4b are -0.092 for new establishment births and -.094 for new establishment employment, meaning a one dollar increase in the minimum wage leads to roughly a 9% decrease in eating and drinking new business activity. While this estimate is larger than what the existing literature has found, the larger estimate is attributable to the narrow geographic scope of the study and the fact that the border methodology estimates an upper bound effect.

VI. Conclusion

The great prominence of state minimum wage increases in the past decade has magnified the importance of understanding how state minimum wages impact the economic vitality of a region. This is especially true in light of mixed evidence from the previous empirical work on the employment effects of the minimum wage.[16] I extend a growing border literature, initiated by Holmes (1998), and continued by research such as Dube, Lester and Reich (2007), and Duranton, Gobillon and Overman (2006), by narrowing the scope of analysis to only one mile on either side of a state border. Specifically, I use a "natural experiment" methodology with a border approach that creates similar neighboring areas along state borders that are only one mile deep from the state border.

[16] Papers such as Neumark and Wascher (1998) find negative employment effects while others like Card and Krueger (1995) conclude that minimum wage has no significant employment effects.

A benefit of narrowing the scope of analysis to only one-mile on either side of a state border is that it allows for better identification of the minimum wage's impact because of the improved ability to control for narrow spatially scoped area characteristics. The identification of this paper relies on the fact that unobserved area characteristics are highly spatially correlated. Therefore, by comparing two neighboring border areas that reside in different states, I can compare two areas with similar unobserved area characteristics in which only one area received a minimum wage increase. Also, by focusing the analysis at the state border, this paper continues the trend in the minimum wage literature of studying those most directly affected; see Currie and Fallick (1996) as an example. Areas along state borders are most directly affected because they must compete with similar areas on the opposite side of the border for new business looking to locate in the region.

This paper finds evidence that entrepreneurs take into account minimum wage changes when choosing where to locate their new business. Analyzing this impact by one-digit industry category, I find that both manufacturing and retail industries are adversely impacted by a minimum wage increase, while I find no impact on business location decision for the businesses in the mining and FIRE industries. When using the percent of an industry's workforce with less than a high school education as a proxy for an industry's reliance on low-skilled workers, this paper finds that businesses in industries with the highest reliance on low-skilled workers are negatively impacted the most.

Lastly, the minimum wage literature has paid special attention to employees in the restaurant industry because of the industry's documented reliance of minimum wage earning workers. Consistent with research by Singell and Terborg (2006), and others, this paper finds that businesses in the eating and drinking places industry are negatively impacted by a minimum

wage increase in areas near the state border. These results indicate that policy makers must be aware that areas near state borders are competing for new business development with other states and that state polices such as the minimum wage can adversely affect the economic vitality of those areas.

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Figure 1: The trend for state minimum wage changes from 1998 to 2006.

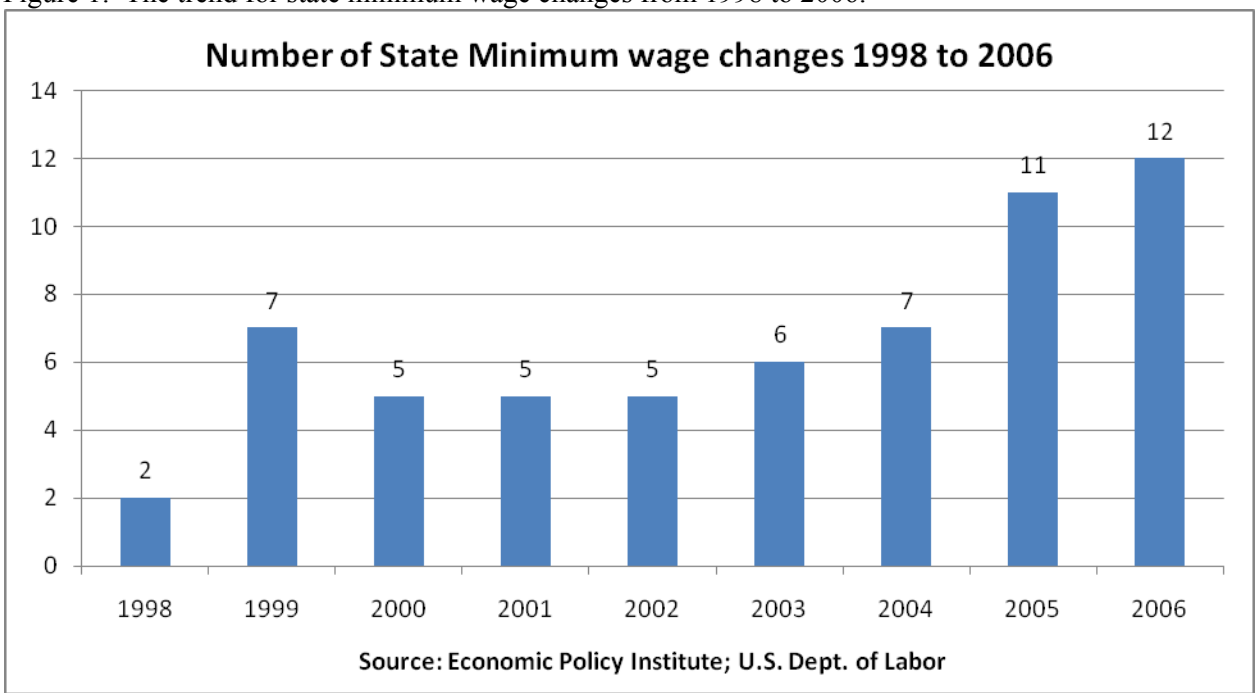

Figure 2: Visual definition for Border-area and Border-area Pair.

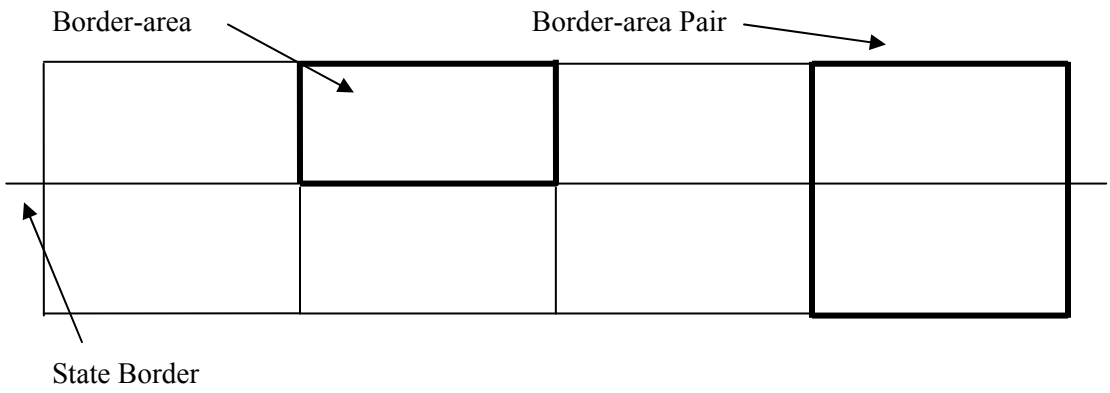

Figure 3: Example of the GIS software border process to create uniform contiguous geographic border-pairs.

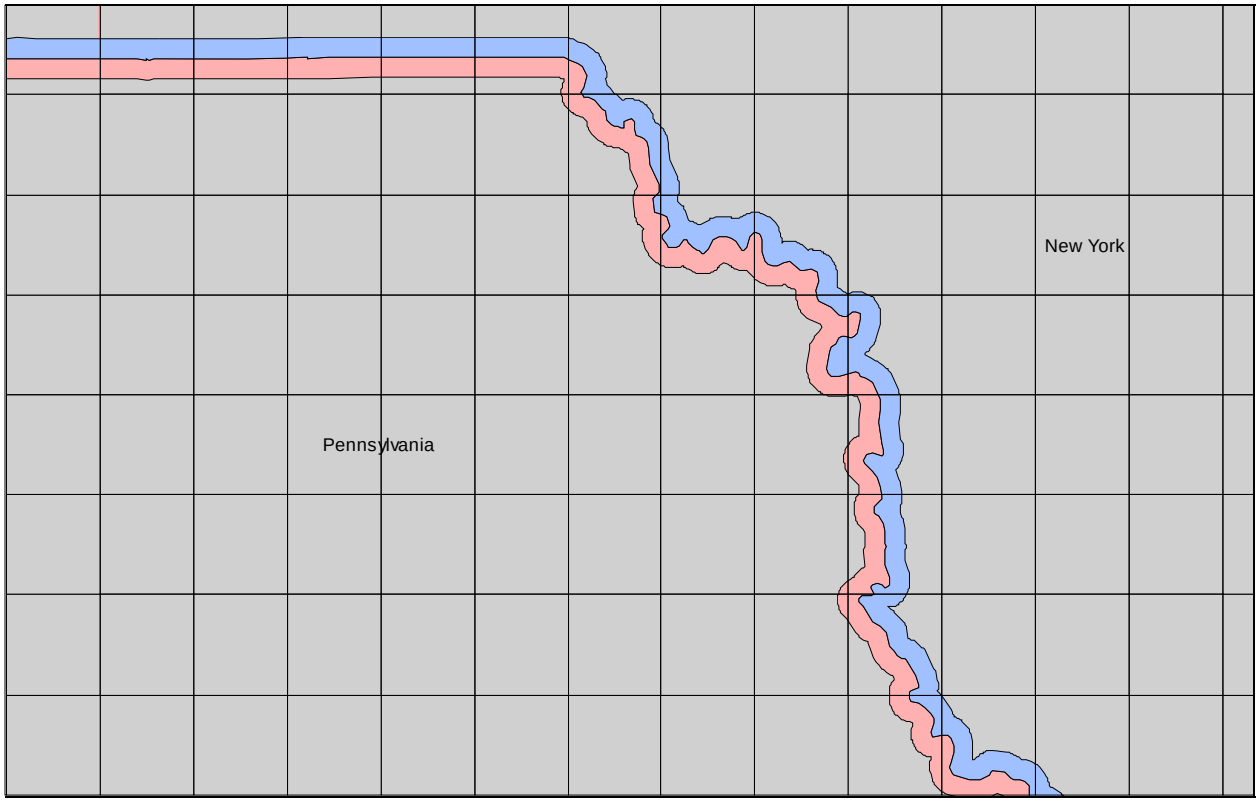

Table 1a: Regression Results for the New Establishment Births for All Industries Pooled Together

(t statistics are in parentheses. Standard errors are clustered by the state border pair for all regressions)

Specification	Zero Differencing % Birth on Side-1		Single Difference % Birth on Side-1 - % Birth on Side-2		Double Difference % Birth on Side-1 - % Birth on Side-2 in 2006 - % Birth on Side-1 - % Birth on Side-2 in 2005
Year	2005	2006	2005	2006	2006 - 2005
	(1)	(2)	(3)	(4)	(5)
Minimum Wage in Real Dollars (W_1)	-.002827	-.015244			
	(0.18)	(0.56)			
Difference in Minimum Wage between Border-Areas in Real Dollars ($W_1 - W_2$)			-.0129767	-.0326438	
			(0.70)	(1.40)	
The Change over Time in Difference in Minimum Wage between Border-Areas ($\Delta W_t - \Delta W_{t-1}$)					-.0341817
					(2.02)
Constant	.4976465	.599942	-.0087778	.0237251	.0267707
	(6.02)	(3.61)	(0.12)	(0.37)	(0.55)
2-Digit Industry FE	80	80	80	80	80
Observations	89,200	89,200	89,200	89,200	89,200
Adj. R^2	0.1780	0.182	0.0057	0.0076	0.0079

[1] For each of the three specifications, the dependent variable is framed as $Births_{1j} / (Births_{1j} + Births_{2j})$ for all j = 1,…,J border-area pairs.

[2] Only side 1 observations are included in the regression to avoid implicitly duplicating observations.

Table 1b: Regression Results for the New Establishment Employment for All Industries Pooled Together
(t statistics are in parentheses. Standard errors are clustered by the state border pair for all regressions)

Specification	Zero Differencing % Emp on Side-1		Single Difference % Emp on Side-1 - % Emp on Side-2		Double Difference % Emp on Side-1 - % Emp on Side-2 in 2006 - % Emp on Side-1 - % Emp on Side-2 in 2005
Year	2005	2006	2005	2006	2006 - 2005
	(1)	(2)	(3)	(4)	(5)
Minimum Wage in Real Dollars (W_1)	-.0028325	-.0108835			
	(0.19)	(0.41)			
Difference in Minimum Wage between Border-Areas in Real Dollars (W_1 - W_2)			-.0112289	-.0287918	
			(0.66)	(1.29)	
The Change over Time in Difference in Minimum Wage between Border-Areas (ΔW_t - ΔW_{t-1})					-.0343602
					(1.91)
Constant	.139902	.3426989	-.0083285	.0318474	.0374373
	(1.40)	(2.20)	(0.19)	(0.36)	(0.39)
2-Digit Industry FE	80	80	80	80	80
Observations	89,200	89,200	89,200	89,200	89,200
Adj. R^2	0.1735	0.1821	0.0055	0.0078	0.0087

[1] For each of the three specifications, the dependent variable is framed as $Emp_{1j}/(Emp_{1j}+Emp_{2j})$ for all j = 1,…,J border-area pairs.

[2] Only side 1 observations are included in the regression to avoid implicitly duplicating observations.

Table 2a: Double Difference Regression Results for New Establishment Births by 1-digit Industries Category
(t statistics are in parentheses. Standard errors are clustered by the state border pair for all regressions)

	Double Difference : (% Birth on Side-1 - % Birth on Side-2 in 2006) - (% Birth on Side-1 - % Birth on Side-2 in 2005)				
	Mining (SICs 10 to14)	Manufacturing (SICs 20 to 39)	Retail (SICs 52 to 59)	FIRE (SICs 60 to 67)	Service (SICs 70 to 89)
	(1)	(2)	(3)	(4)	(5)
Change in Difference in Minimum Wage between Border-Areas over Time	.0103529	-.0540497	-.0765184	.0422782	-.0319431
	(0.26)	(2.00)	(2.07)	(0.79)	(0.64)
Constant	-.0121521	-.0907838	-.0064129	-.0083332	-.0239619
	(0.30)	(1.14)	(0.08)	(0.14)	(0.36)
2-Digit Industry FE	4	20	8	7	15
Observations[3]	4,460	22,300	8,920	7,805	16,725
Adj. R^2	0.001	0.01	0.01	0.01	0.01

[1] For all specifications, the dependent variable is framed as $Births_{1j} / (Births_{1j} + Births_{2j})$ for all j = 1,…,J border-area pairs.

Only side 1 observations are included in the regression to avoid implicitly duplicating observations.

[3] Each observation is a 2-digit SIC in a given border-area pair. Therefore, the number of observations are the number of industries times the number of border-pairs (1115).

Table 2b: Double Difference Regression Results for New Establishment Employment by 1-digit Industries Category
(t statistics are in parentheses. Standard errors are clustered by the state border pair for all regressions)

	Double Difference : (% Emp on Side-1 - % Emp on Side-2 in 2006) - (% Emp on Side-1 - % Emp on Side-2 in 2005)				
	Mining (SICs 10 to14)	Manufacturing (SICs 20 to 39)	Retail (SICs 52 to 59)	FIRE (SICs 60 to 67)	Service (SICs 70 to 89)
	(1)	(2)	(3)	(4)	(5)
Change in Difference in Minimum Wage between Border-Areas over Time	.0062357	-.0503079	-.084159	.0382637	-.0321879
	(0.17)	(2.26)	(2.14)	(0.62)	(0.81)
Constant	-.0116098	-.085519	-.0225029	.0253115	-.0383003
	(0.30)	(1.11)	(0.28)	(0.46)	(0.63)
2-Digit Industry FE	4	20	8	7	15
Observations[3]	4,460	22,300	8,920	7,805	16,725
Adj. R^2	0.001	0.01	0.01	0.01	0.01

[1] For all specifications, the dependent variable is framed as $Emp_{1j} /(Emp_{1j} + Emp_{2j})$ for all j = 1,…,J border-area pairs.

Only side 1 observations are included in the regression to avoid implicitly duplicating observations.

[3] Each observation is a 2-digit SIC in a given border-area pair. Therefore, the number of observations are the number of industries times the number of border-area pairs (1115).

Table 3: Double Difference Regression Results for the Impact of State Minimum Wage Changes by Industries with Different Reliance of Low Educated Workers
(t statistics are in parentheses. Standard errors are clustered by the state border pair for all regressions)

	Percent of Industry Workforce with Less Than HS Education							
	Less Than 5%		5% to 15%		Greater than 15%		All Industries	
	New Establishment Births	New Establishment Employment	New Establishment Births	New Establishment Employment	New Establishment Births	New Establishment Employment	New Establishment Births	New Establishment Employment
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
The Change in Difference in Minimum Wage between Border-Areas over Time	-.0059344	.0005741	-.042798	-.0458874	-.0791829	-.0720263	-.0242629	-.0187601
	(0.29)	(0.03)	(1.84)	(1.97)	(2.57)	(2.77)	(1.09)	(0.87)
Change in Difference in MW between Border-Areas over Time X % Less Than HS Educated							-.1279678	-.1710907
							(0.88)	(1.26)
Constant	-.0024752	-.0048438	.0021723	.0045993	.0536117	.0414716	.008221	.0066142
	(0.15)	(0.28)	(0.11)	(0.23)	(1.85)	(1.68)	(0.50)	(0.40)
Number of Industries	30	30	38	38	12	12	80	80
Observations	33,450	33,450	41,255	41,255	13,380	13,380	88,085	88,085
Adj. R^2	0.001	0.001	0.001	0.001	0.0028	0.0023	0.001	0.001

Note: 1) Each observation is a 2-digit SIC in a given border-area pair. Therefore, the number of observations is the number of industries times the number of border-area pairs (1115).

2) The percent of an industry's workforce with less than a high school education is created by the IPUMS data set.

Table 4a: Regression Results for the New Establishment Births for Eating and Drinking Industry-SIC 58
(t statistics are in parentheses. Standard errors are clustered by the state border pair for all regressions)

Specification	Zero Differencing % Birth on Side-1		Single Difference % Birth on Side-1 - % Birth on Side-2		Double Difference % Birth on Side-1 - % Birth on Side-2 in 2006 - % Birth on Side-1 - % Birth on Side-2 in 2005
Year	2005	2006	2005	2006	2006 - 2005
	(1)	(2)	(3)	(4)	(5)
Minimum Wage in Real Dollars (W_1)	-.029756	-.0661621			
	(2.44)	(1.56)			
Difference in Minimum Wage between Border-Areas in Real Dollars (W_1 - W_2)			-.0089322	-.0171954	
			(0.55)	(0.55)	
The Change over Time in Difference in Minimum Wage between Border-Areas (ΔW_t - ΔW_{t-1})					-.0923186
					(1.89)
Constant	.2221654	.4972863	-.0093193	-.0133723	.0357961
	(2.69)	(1.65)	(0.44)	(0.28)	(0.78)
Observations	1,115	1,115	1,115	1,115	1,115
Adj. R^2	0.0191	0.0389	0.0010	0.0022	0.0096

[1] For each of the three specifications, the dependent variable is framed as $Births_{1j}/(Births_{1j}+Births_{2j})$ for all j = 1,…,J border-area pairs.

[2] Only side 1 observations are included in the regression to avoid implicitly duplicating observations.

Table 4b: Regression Results for the New Establishment Employment for the Eating and Drinking Industry -SIC 58

(t statistics are in parentheses. Standard errors are clustered by the state border pair for all regressions)

Specification	Zero Differencing % Emp on Side-1		Single Difference % Emp on Side-1 - % Emp on Side-2		Double Difference % Emp on Side-1 - % Emp on Side-2 in 2006 - % Emp on Side-1 - % Emp on Side-2 in 2005
Year	2005	2006	2005	2006	2006 - 2005
	(1)	(2)	(3)	(4)	(5)
Minimum Wage in Real Dollars (W_1)	-.0272945	-.0620467			
	(2.33)	(1.64)			
Difference in Minimum Wage between Border-Areas in Real Dollars (W_1 - W_2)			-.0067201	-.015353	
			(0.44)	(0.54)	
The Change over Time in Difference in Minimum Wage between Border-Areas (ΔW_t - ΔW_{t-1})					-.0940016
					(2.12)
Constant	.2049853	.4599478	-.0099518	-.024331	.027346
	(2.59)	(1.70)	(0.50)	(0.56)	(0.70)
Observations	1,115	1,115	1,115	1,115	1,115
Adj. R^2	0.017	0.0415	0.001	0.002	0.0111

[1] For each of the three specifications, the dependent variable is framed as Emp_{1j} /(Emp_{1j} +Emp_{2j}) for all j = 1,…,J border-area pairs.

[2] Only side 1 observations are included in the regression to avoid implicitly duplicating observations.