The Impact of Main Street Revitalization on the Economic Vitality of Small-Town Business Districts

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Abstract

The Main Street Program is a popular smaller-scale economic development strategy used to revitalize historic town centers across the rural United States. In this article, I implement a difference-in-differences design using longitudinal business establishment data to estimate the program's causal impact on job and establishment growth in downtown retail districts. Using a pooled sample of four Midwest states, I find no significant effect of Main Street Program adoption on downtown jobs or establishments. However, for each individual state, a substantial degree of structural heterogeneity across states exists. Iowa emerges as a state where the Main Street Program appears to yield its hypothesized economic benefits to the downtown business districts of participating communities. These findings suggest that Main Street Program participation effects are not generalizable across states and that implementation and local context matter.

This is the final version of the working paper for this study. Please **click here** to access the version published by *Economic Development Quarterly*.

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1. Introduction

Across the rural United States, numerous small towns have historic business districts that experienced decline and disrepair throughout the mid-20th century. The resulting disinvestment and physical deterioration are largely a result of the migration of economic and civic activity outward from downtown toward highway interchanges and big-box discount stores. In spite of their diminished vibrancy, underutilized downtown business districts represent the "heart and soul" of rural communities (Robertson, 1999) and are still recognized as untapped "economic engines" (Birch, 2002) of growth within their larger region.

Motivated by downtown's potential as a differentiated retail and entertainment space, many planners and local government practitioners have come to see downtown revitalization as a promising economic development strategy (Faulk, 2006). By far the most ubiquitous approach to downtown revitalization, the Main Street Program helps equip smaller towns and cities with the resources and practical knowledge to leverage their historic retail corridors as an economic development asset. However, there exists little empirical evidence regarding the substantive, long-term impact of the program on local economic vitality.

In this paper, I use longitudinal business establishment data to evaluate the viability of the Main Street Program as a means of downtown revitalization in rural towns and cities. I implement a difference-in-differences design which estimates the program's causal impact on job growth in the downtown retail district. The remainder of this paper is structured as follows. The first section provides additional background about the Main Street Program and lays out a framework that justifies the use of downtown job growth as an operationalization of economic vitality. In the second and third sections, I describe my data sources and empirical strategy, respectively. The fourth section includes a detailed examination of my results. I conclude with a discussion of the study's implications for scholars and practitioners.

2. Background & Motivation

In this section, I review the recent history of retail in rural downtowns, highlight the key features and mechanisms of the Main Street Program, and explain how and why the outcome variables in the analysis—downtown job and business establishment growth—are suitable measures of the Main Street Program's impact on local economic vitality.

2.1 Defining Key Concepts

The analysis of this paper focuses on job and business establishment growth in rural downtown business districts. It is appropriate to first clarify what I mean by "rural" and "downtown" throughout the paper. I adopt the traditional analytical definition of rurality, which classifies all counties

outside of metropolitan statistical areas as rural (Johnson and Cromartie, 2006).[1] Additionally, I use the rural-urban continuum code classification scheme (see Butler and Beale, 1994) in my empirical models to account for differing degrees of rurality based on population and distance to a metro area. Within a rural county, I use the umbrella term of "community" to refer to any of its municipalities—cities, towns, boroughs, villages, etc.—that contain a downtown business district.

Downtown districts are typically located in close proximity to the "historic beginnings of the city" (Robertson, 2001) and possess higher building densities relative to other corridors or districts in the community (Francaviglia, 1996). Conceptually, I define *downtown* as the dense co-location of commercial and civic activity in a part of the community that was developed prior to the advent of the automobile. Although imperfect, this conceptualization captures the locale within a community where its important civic institutions (city hall, banks, post offices, libraries) are densely located and accessible on foot.[2] In a later section of the paper (see Section 3), I lay out my strategy for empirically distinguishing municipalities that contain a pre-automobile downtown business district from those that do not.

2.2 Small Town Retail Market Patterns in the Twentieth Century

As defined above, downtown business districts were once the dominant option for retail commerce, service provision, and local government activity in rural communities. Rural downtowns never *fully* substituted for the range of good and services available in larger metropolitan business district (Francaviglia, 1981), but they nonetheless served as a hub of commerce, social gathering, and civic engagement for households living in rural areas throughout the country (Chase and Pulver, 1983). However, for a variety of reasons, the rural downtown district began its decline in the mid-20th century, losing its share in the regional retail market relative to newer forms of retail development (Robertson, 1995).

The post-WWII spike in automobile ownership caused massive shifts in household consumption habits and preferences: trips once made on foot or by public transit were replaced with trips made by car, and this change in modality spurred an evolution of the built environment commonly identified as "sprawl" (Filion et al., 2004; Galster et al., 2001; Jackson, 1985). While pedestrian-oriented retail was typically concentrated in the downtown business district, developers typically opted to build automobile-oriented shopping and dining outlets at low-density sites on the outskirts of town. New retail buildings were often constructed as single-story buildings with a "minimum of landscaping and architectural flair" and surrounded by large swaths of paved asphalt parking lots (Halebsky, 2004).

[1] Johnson and Cromartie (2006) describe non-metropolitan counties as the residual of counties which "are not metropolitan, meaning they contain neither cities of over 50,000 residents, nor urbanized areas of over 100,000 residents, nor counties integrated economically with the former."

[2] Scholars who study downtowns and downtown revitalization (see Birch, 2009) acknowledge that there is no easy way to conceptually or empirically define a prototypical "downtown," owing to the wide heterogeneity of central business districts across towns and cities in North America.

In addition to changing the retail landscape within rural communities, increased automobile use led to demand for state and federal infrastructure expenditures which, in turn, improved rural road networks and allowed rural dwellers to travel further distances to shop at larger retailers in more urbanized areas (Leistritz et al., 1992). Furthermore, thanks to innovations in transportation and communications technology, small-scale services and entertainment attractions could more easily be consumed either in larger cities or via television (Daniels, 1989).

Cumulatively, these changes worked to diminish the importance of downtown as a focal point for social interaction, civic engagement, and cultural transmission in rural communities. Because transportation technologies tend to influence cities' size and shape (Glaeser and Kahn, 2004), the advent of the automobile significantly reshaped both the look and feel of rural small towns. For rural communities where downtown activities migrated outward toward sprawling, more car-intensive locations, "daily life was no longer tied to walking" (Talen and Jeong, 2019), and downtown business districts experienced a loss in community identity (Bell, 2016). Ultimately, the loss of key local businesses had wide-reaching indirect effects for rural communities and their residents, including job loss, residential outmigration, and a decline in the local tax base (Ayres et al., 1992).

2.3 Downtown Revitalization and the Main Street Program

The aspiration to revitalize downtown originates from a recognition that the present-day retail landscape is unlikely to revert to a pre-automobile state. Economic development scholars have long studied the effect of big-box retail entry on local economic vitality—many of which focus on the case of Walmart—and the evidence is mixed: with some finding positive effects (Daunfeldt et al., 2017; Hicks et al., 2012), others finding negative effects (Haltiwanger et al., 2010; Neumark et al., 2008; Stone, 1995), and still others finding some combination of the two (Artz and Stone, 2012; Basker, 2005). Regardless of their overall finding, the prevailing consensus among these studies is that the efficiency advantages of big-box retail over local independent retail are unlikely to disappear. Irwin and Clark (2006) suggest that smaller local retailers should develop innovative strategies to stay competitive with big box competition, and Brennan and Lundsten (2000) counsel downtown retailers to focus on providing a differentiated shopping experience.

It is in this context that the Main Street Program has become a popular strategy for stabilizing and improving the economic vitality of rural downtown districts across the United States.[3] Launched in 1977 by the National Trust for Historic Preservation, the primary goal of the Main Street Program (MSP) is to provide communities with the resources and practical knowledge to rejuvenate their historic commercial districts. The program's four "transformation strategies"—design, promotion, organization, and economic vitality—are designed to help communities to revitalize or strengthen their commercial district's economy (National Main Street Center, 2021; Robertson, 1997) by capitalizing on the aesthetic and historical value of the buildings and civic spaces that comprises its

[3]Many municipalities do not contain an actual thoroughfare called "Main Street." In this paper I refer to any community's primary retail corridor—such as Chicago Street in Coldwater, MI or Court Street in Athens, OH—as its *Main* Street.

central, pedestrian-oriented retail district (Dono and Glisson, 2009).[4] When a community adopts the program, an initial step is to hire a full-time program director who is responsible for coordinating the public and private efforts of community stakeholders as they strive to make the downtown district an economically and culturally vibrant place once again (Seidman, 2004). Such efforts include hosting and promoting downtown events (e.g., festivals and farmers' markets), helping property owners navigate through the bureaucratic red tape of historic preservation grant and tax credit applications, and providing technical assistance to small business owners by distilling best practices and coordinating collective efforts of downtown retailers (Loescher, 2009; Smith, 2009).

Robertson (2004) surveyed MSP-participating communities to identify which of the program's transformation strategies received the most attention and found that economic vitality was the strategy *least* emphasized by local MSP directors in their implementation of the program. This is likely because the other three strategies—design, promotion, and organization—are each program outputs, while economic vitality is instead an *outcome*, which entails "real results" rather than simply a measurement of government action (Lane and Ersson, 2000). Evaluating true program outcomes requires a research design that isolates the program's contribution to the outcome, independent of other factors. This difficulty may explain why a majority of previous research on the MSP has focused on its more measurable components. While downtown economic development projects may yield "intangible" benefits (West and Orr, 2003) such as community pride and improved perceptions of economic prosperity, the analysis in this paper measures outcomes which can be empirically measured.

2.4 Job & Establishment Growth and the Main Street Program

Due to its focus on a narrowly defined geographic area, the Main Street Program is best characterized as a "place-based" intervention. Place-based policies and programs are expected to deliver both direct, geographically targeted benefits as well as indirect benefits, which "depend on responses of the private sector" to make long-term decisions toward investing in a given place (Duranton and Venables, 2018). However, because the MSP's scale and budget are dramatically smaller than typical place-based interventions, it is more challenging to study than its larger urban counterparts such as the Urban Enterprise Zone program of the 1990s (Neumark and Kolko, 2010).[5] As such, it is not sufficient to measure the aggregate impact of MSP adoption on municipality-wide measures of economic vitality. Rather, I focus on a hyper-local spatial area—a community's downtown district—because the MSP is, at best, likely to have an impact on a relatively small spatial extent beyond the community's central business district.

[4] See Appendix A for more information about the design and purpose of the Main Street "transformation strategies."

[5] While size and scale are the key differentiators of the MSP relative to other place-based economic interventions, data quality also hampers analysis of the MSP, as data collection and availability are less reliable in rural areas relative to urban areas (Payton Scally et al., 2020). In a review of studies attempting to describe the MSP's association with economic vitality indicators, Bradbury (2011) observed that such studies typically rely on data that come from the Main Street communities themselves and "thus are not able to be independently verified."

In this paper, I operationalize economic vitality in terms of jobs and business establishments added in a community's downtown retail district in the years following MSP adoption. I expect to observe an increase in downtown jobs and establishments for communities that adopt the MSP relative to the communities that do not adopt the program. Underlying this expectation is the theorized link between "place-making" and economic vitality. As defined by Markusen (2013), place-making refers to efforts to shape a community's physical and social character around its distinct character and cultural heritage. While Glaeser and Gottlieb (2008) remark that place-based policies are unlikely to succeed at reviving an entire declining region, they acknowledge that such policies may be more successful at improving the quality of life in targeted places and reallocating economic activity *within* the greater labor market. This possibility aptly captures the intended outcome of the MSP: a transformation of the downtown retail district into a more attractive and enticing place, thus elevating its *relative* position above other retail districts and environments within the larger regional market.

Place-making efforts in the Main Street Program center around transforming downtown into a "third place" (Oldenburg and Brissett, 1982) where individuals can spend their time and money in a setting outside of the home, the workplace, and the '9-to-5' work schedule (Burayidi, 2013). Existing downtown businesses may already cater to customers that patronize their establishments during work hours,[6] but communities that can attract people downtown *after* work will capture what Montgomery (1995) calls the local "evening economy." In her seminal work on urbanism, Jacobs (1961) observed that the vibrancy of a community's "casual public sidewalk life" is what imbues its streets with a feeling of vitality. Montgomery (1998) elaborated on this point by adding that downtown vitality entails the number of people on the street at various times of day, the extent to which buildings and facilities are utilized throughout the year, and most importantly, the diverse mixture of economic activities located therein (see also Padilla and Eastlick, 2009).

Bringing economic activity back toward rural town centers—from the sprawling, car-oriented outskirts of town to which it migrated in the twentieth century—requires community stakeholders to devise creative and enduring ways to change public perception of downtown. As described above, downtown retail businesses are not likely to be able to compete with big-box discount stores and strip-mall chains on matters of cost and efficiency. However, independently owned small businesses *can* compete by offering differentiated products and experiences that capitalize on the uniqueness of the historic business district and encourage patrons to regard downtown shopping trips as a recreational event rather than an errand (Wansborough and Mageean, 2000).

The key assumption underlying the design of the Main Street Program is that successful adoption and implementation of the program stimulates downtown foot traffic and business patronage, sending a signal to business owners and community stakeholders that the downtown district has become

[6]For instance, a print and copy shop may locate near the county courthouse to accommodate the daytime demand from the legal profession. Such businesses may succeed regardless of downtown revitalization efforts because they are strategically tied to institutions that are anchored in place.

a vibrant retail site. However, rather than focus on foot traffic and patronage as first-order outcomes of downtown revitalization efforts, I measure the MSP's more medium- to long-term impact on local economic vitality in terms of added jobs and establishments in the downtown district in the years following program adoption. Furthermore, as the mission and actions of the MSP are more closely aligned with retail businesses than with any other industry sector, I also estimate the MSP's effect on the growth of downtown *retail jobs* and *retail establishments* in communities that adopt the program.

3. Data

To estimate the impact of the MSP on downtown job growth, I combine multiple data sources to create a panel of jobs and MSP program adoption status of nearly 500 non-metropolitan communities in four states from 1997 to 2019.

3.1 The Study Universe

I limit my analysis to a series of four adjacent states in the U.S. Midwest—Iowa, Michigan, Ohio, and Wisconsin—each with a relatively even distribution of small towns across the rural-urban continuum.[7] However, a substantial degree of heterogeneity exists among municipalities in these four states, even within non-metropolitan counties. Some communities were incorporated in the 19th century and contain a historic downtown business district, while others were incorporated only in the last half-century, home to mostly farmland or undeveloped forest prior to the automobile era. Thus, it is not appropriate to compare job growth in older municipalities with a downtown business district relative to newer, more car-dependent townships without one.

I used the following set of rules to construct a universe for the study, containing only municipalities that are suitable for quasi-experimental comparison (see Figure 1). It consists of places that:

- *Were located in a non-metropolitan county.* The Main Street Program is primarily adopted by communities that already fit this description. However, the MSP has been adopted by some neighborhoods (such as "Historic King Drive" in Milwaukee or "Nob Hill" in Albuquerque) in larger urban areas. This rule prevents municipalities within commuting distance of a large urban agglomeration from being compared with those in rural areas.
- *Had a 2010 population of between 750 and 50,000.* This ensures that comparisons are limited to the center of the population distribution, restricting very large cities and very small towns. Due to the above non-metropolitan rule, there are already very few municipalities in the universe larger than 50,000 residents. However, the four selected states each have several

[7] I limited the number of states studied in this paper for two reasons. First, the analysis requires thorough and accurate information regarding each community's MSP adoption timeline. The "missing" states which logically would fit neatly into this study—such as Illinois and Indiana—were not included because of difficulties in acquiring MSP adoption year data. Second, although MSP adoption data were available from other states (such as Oregon or Texas), I decided to limit the analysis to four—Iowa, Michigan, Ohio, and Wisconsin—because they are spatially adjacent and belong to a coherent geographic region as part of the US Midwest.

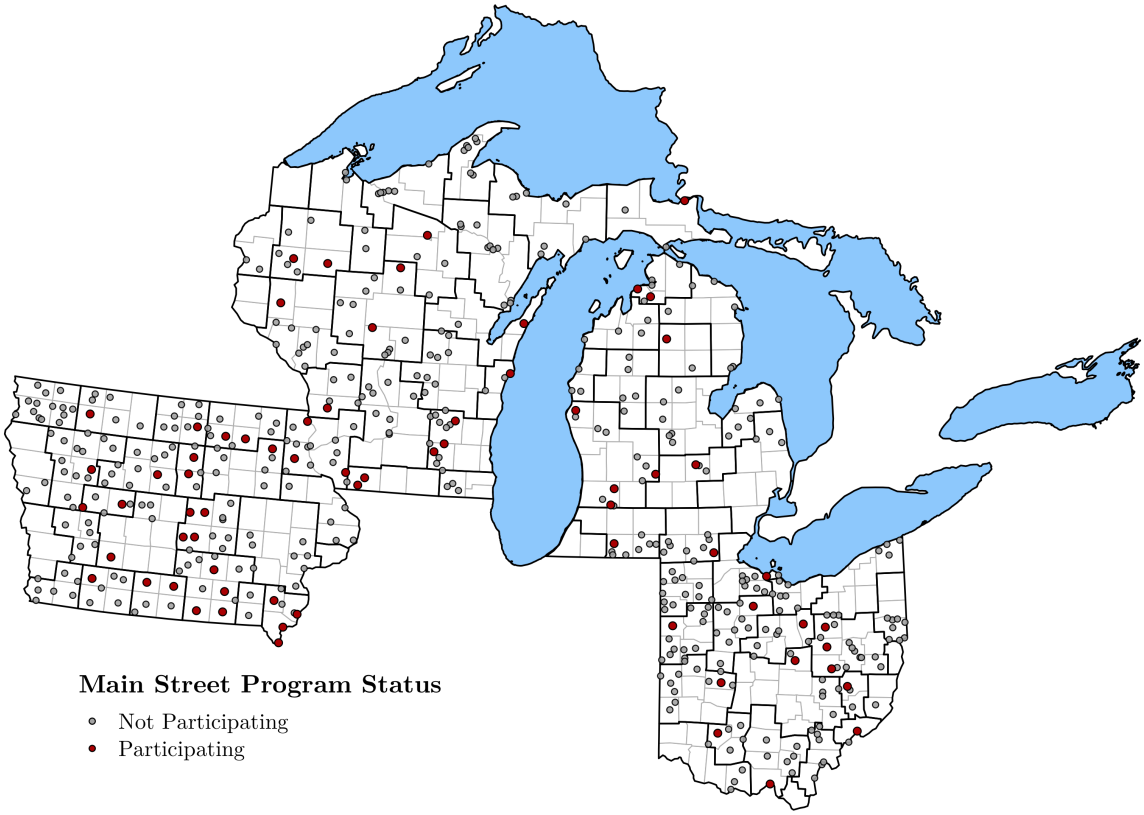

Figure 1: The Study Universe

hundred municipalities of fewer than 750 residents, which are too small to make appropriate comparisons with job and establishment growth in larger towns and cities.

- *Had a 1920, 1930, or 1940 population of at least 1,000.* This roughly establishes whether a community had established a downtown business district prior to the automobile era. Some present-day suburban municipalities are very old in terms of the year of their founding or incorporation but nonetheless consisted largely of undeveloped farmland prior to the post-WWII housing boom.

These rules reduce the list of all municipalities in Iowa, Michigan, Ohio, and Wisconsin from 3,893 down to a total of 494. Jobs were only counted for business establishments located within the municipal boundaries of each of the 494 communities in the universe, and I separately tabulated downtown *retail* job and establishment counts for each community as well. Figure 1 displays all communities in the study universe, distinguishing the treatment group (larger red dots) from the comparison group (smaller grey dots).[8]

3.2 Data Sources

Data regarding business establishment and jobs come from Infogroup Inc. (2020), which includes records of millions of U.S. businesses (including sole proprietorships), public agencies, and non-profit organizations, each linked to its geographic location (i.e., its latitude and longitude coordinates). Each entry in the dataset contains basic information on each entity, such as number of employees, year established, and its corresponding NAICS industry code.

Another source of data was the year when each community joined the Main Street Program, taken from the state program's web page or received via email correspondence with the state MSP director (see Table 1 for more information about relevant differences in MSP administration at the *state* level). This variable was used to create a dummy variable indicating whether the municipality ever, at any point, adopted the MSP. I also used the MSP adoption data to generate a series of additional dummies to indicate whether the observed calendar year was the community's first, second, third, fourth, or fifth full year as a participant in the MSP. I also created binary variables to indicate "year zero" (the year adoption took place) as well as the three years *prior* to adopting the program.

I include two time-varying control variables to improve the efficiency of the main effect estimates. First, I use annual midyear population estimates (collected from the Bureau of Economic Analysis) to account for temporal changes in county population. Second, to account for changes over time in the tightness (or slack) in the local labor market I include the ratio of total jobs in the county

[8]The map also differentiates between geographic boundaries, which play a role in specifying fixed-effect terms in the empirical model: thicker black lines are commuting zone (CZ) boundaries, while thin gray lines represent county borders.

relative to the prime working-age population (persons aged 25 to 64) in a given year.[9] To reduce potential endogeneity bias with the outcome variable, I lagged the latter variable by one calendar year.[10]

Table 2 displays summary statistics for the variables used in the analysis.[11] While not included in the analysis, the table also includes basic demographic variables in the summary table to describe the distribution of population, race, age, and household income for the municipalities in the study universe. There are 1,314 observations in each panel, which correspond with a nine-year time interval—from three years prior until five years post-treatment—for 146 different communities. This is because, although 494 municipalities qualified to belong in the study universe, many of the "treated" (i.e., MSP-participating) communities adopted the MSP in a year that fell outside of the range of availability of the Infogroup longitudinal business establishment dataset.[12]

3.3 Geographically Calculated Variables

To my knowledge, no existing geographic data exist to delineate the spatial extent of the historical business district for each community in the study universe. To tabulate the number of "downtown jobs" in each community, it was thus necessary to manually code for the geographic boundaries of all 494 downtown districts. This was done by carefully using aerial imagery to identify the rough cutoff at which the dense concentration of downtown buildings and sidewalks gives way to less-dense residential neighborhoods.[13] The hand-coded downtown districts provide a reasonable approximation of where a community's historic town center is located.

I used a series of geographic information systems (GIS) operations to calculate the number of jobs located in each community's downtown business district for every year of the panel. First, I mapped every business establishment according to its geo-coded coordinates using the NAD83 "Great Lakes

[9] The annual number of total county-wide jobs was obtained from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW). Rather than use the total county population as the denominator in the variable, I use the number of persons between the ages of 25 and 64—which I call the "prime working age" population (PWP)—living in the county in a given year. The PWP is tabulated from the National Institute of Health's Surveillance, Epidemiology, and End Results (SEER) Program, which maintains a dataset of annual county populations broken out by age, sex, and race.

[10] Even when lagged, the relationship between the ratio of total jobs to the prime working-age population (J:PWP ratio) and number of downtown jobs may still be endogenous. I nevertheless include the annual county J:PWP ratio for two reasons. First, relative to the entire county, the Main Street business district is relatively very small, and thus unlikely to substantively correlate with the county J:PWP ratio in a given year. Second, and more importantly, the inclusion of the county J:PWP ratio has very little effect on the main effect estimates. While the added time-varying controls help to tighten the standard errors, they do not substantively change the *magnitude* of the actual treatment effect.

[11] See Appendix B for summary statistics of all panel variables presented at the single-state level.

[12] If data availability allowed for observation of the full analytical universe, there would be 494 nine-year time intervals in the panel, for a total of 4,446 observations. However, as the first available year of data in the Infogroup dataset is 1997, a large number of the communities in the universe—for which the year of MSP adoption occurred prior to 1997—are not included in the analysis. Additional summary tables are included in Appendix C to compare the characteristics of the dropped versus the included observations. The summary statistics indicate that the 348 communities not included in the analysis do not systematically differ from the 146 that *are* included in the empirical model.

[13] See Appendix D for more information—including graphical descriptions and examples—regarding the downtown geo-coding procedure.

Table 1: State-Level MSP Coordinating Organizations

State	Program Name	Parent Organization	Parent Organization Type
Iowa	Main Street Iowa	Iowa Economic Development Authority	State economic development agency
Michigan	Michigan Main Street (MMS)	Michigan Economic Development Corporation	State-affiliated public-private partnership agency
Ohio	The Ohio Main Street Program	Heritage Ohio	Non-profit historic preservation organization
Wisconsin	Wisconsin Main Street	Wisconsin Economic Development Corporation	State-affiliated public-private partnership agency

Table 2: Summary Statistics

	Mean	Std. Dev.	Min	Max
Demographic Variables[a]				
Population (2010)	6,325	6,867.6	776	36,837
Percent Non-White (2010)	6.2	6	1	32
Median Age (2010)	38.9	5	22	56
Median Household Income (2010)	40,743.3	7,822	24,054	72,258
Panel Variables				
Calendar Year	2007	4.3	1997	2017
Rural-Urban Continuum Code[b]	5.6	1.4	4	9
Treatment (MSP Adopted?)	0.2	0.4	0	1
Downtown Jobs	1,056.2	1,152.4	3	8,252
Downtown Jobs Per 1k	196.1	137.6	2	1,285
Downtown Establishments	140.7	119.5	3	620
Downtown Establishments Per 1k	28.8	16.6	2	111
N	1,314			

[a] The demographic characteristics are included in the summary table for additional context but are not included in any regression analyses.

[b] Rural-Urban Continuum Codes span from 1 (most urban) to 9 (most rural). Codes 1, 2, and 3 denote *metropolitan* counties, and are not included in the analysis.

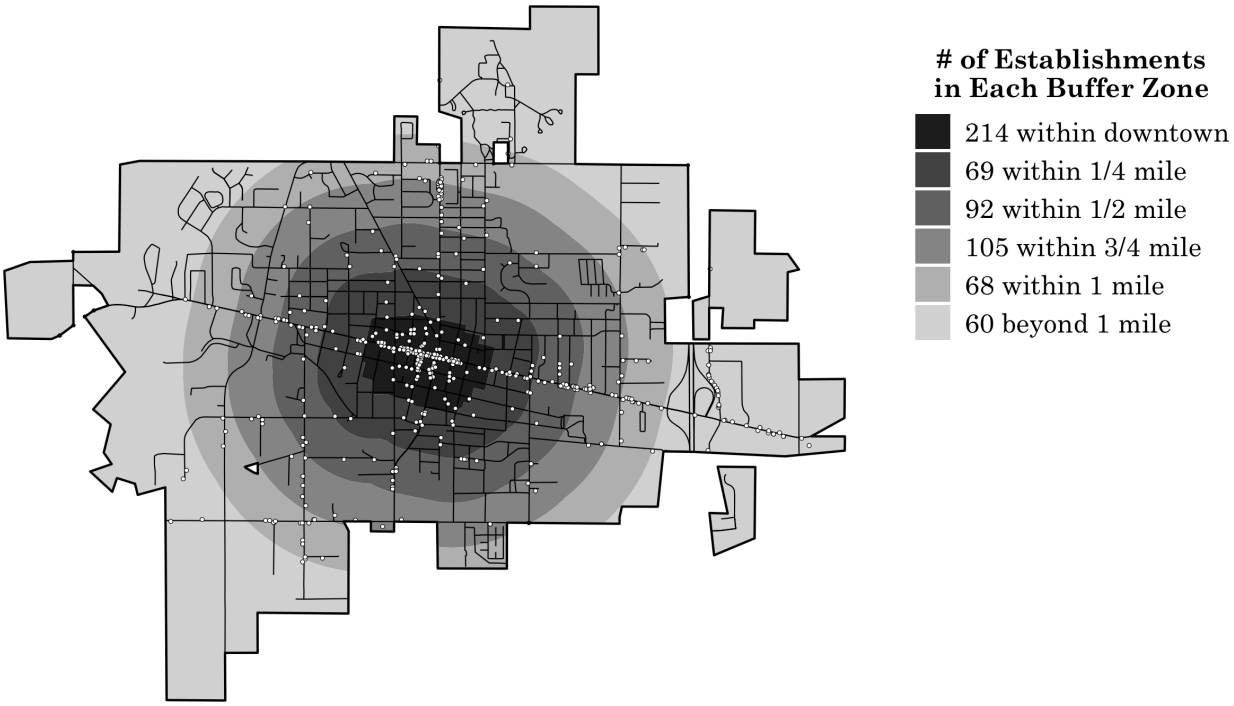

Figure 2: Business Establishments in Coldwater, MI in 2000

Albers" map projection, which is accurate to within one meter for the observations in the analysis. Second, I used a buffer of 200 meters (about ⅛ mile) outward from downtown, generating a polygon that roughly corresponds to the boundaries of the downtown business district (see the darkest-shaded polygon on the map in Figure 2). I then created four additional buffers representing within downtown, within ¼ mile, within ½ mile, within ¾ mile, and within one mile.[14] The remainder of the area within municipal boundaries pertains to land beyond one mile of the downtown business district. Finally, I used a spatial intersect operation to identify which buffer zone each business establishment belonged to. From that I was able to tabulate the number of business establishments and number of jobs in each zone. In this study, I primarily rely on the number of jobs and business establishments inside the *⅛-mile buffer around downtown* as the outcome variable. However, I use the data from the outer spatial buffers when testing the sensitivity of my model estimates.

4. Empirical Strategy

I employ a difference-in-differences (DD) design, comparing communities that adopted the Main Street Program with those that did not. More specifically, I focus on the impact of MSP adoption on the number of downtown jobs in participating communities' downtown districts, as compared to

[14]It should be noted that each buffer zone is mutually exclusive and collectively exhaustive with regards to the spatial territory inside each community's municipal boundaries. For instance, while the second "ring" in Figure 2 is labeled "within ½ mile," it does not capture any territory within ¼ mile, which instead pertains to the first ring around downtown.

the number of downtown jobs in non-participating communities. I implement this DD design using the following ordinary least squares model:

$$Y_{ict} = \alpha\ MSP_i + \sigma\ POST_t + \beta\ MSP_i * POST_t + \gamma_{ct} + \phi_i + \varepsilon_{ict} \tag{1}$$

where Y_{ict} is the total number of downtown jobs (or establishments) in community i in calendar year t and commuting zone c, γ_{ct} are commuting-zone-by-calendar-year fixed-effects, and ϕ_i are community fixed-effects. MSP_i indicates "treatment" (i.e., whether a community adopts the Main Street Program at any point during or prior to the study period) and $POST_t$ indicates that calendar year t is greater than or equal to the year in which the treatment took place. In the results below, I report standard errors clustered by state, and my parameter of interest is β, which should capture the impact of Main Street Program adoption on the number of downtown jobs per 1,000 residents. While I include the traditional DD design from the above equation in my results, I also implement an *event-study* DD design in which the "post" treatment dummy variable is replaced by a vector of "relative year" dummies—ranging from 3 years prior- to 5 years post-treatment—which I interact with MSP_i to estimate the program's impact over a 9-year time period.[15]

The commuting zone fixed effects capture the local economies in which people work and live, which allows for comparisons among communities operating in similar economic environments (Cook et al., 2020). My identifying assumption, therefore, is that communities within the same commuting zone share relatively common trends in labor market outcomes, such as job creation and business establishment formation. As there is no predetermined "treatment year" across all observations, there is no obvious year at which to set the treatment for observations in the comparison group. To overcome this, I calculated the distance between every treated and untreated observation within 50 miles of one another[16] and linked each untreated observation with its nearest treated "neighbor" to assign it a quasi-treatment year.[17]

I conducted a variety of tests to confirm the robustness of my model findings. First, I tested the sensitivity of my findings by repeating each regression using different calibrated sizes of the downtown district (see Figure 2). When making smaller adjustments—inward or outward by between 50 and 100 meters, or roughly one city block—to the spatial area considered as "downtown," the DD estimates remained relatively stable.[18] However, when expanding downtown to include the entire

[15] I omit the one-year-prior interaction from the model as the necessary reference category. However, my results do not significantly change when instead using the two-years-prior interaction as a reference category.

[16] While 50 miles exceeds the typical commute in a metropolitan labor market, commute distances are typically much longer in less dense environments (Aldrich et al., 1997), thus justifying the 50-mile radius for linking the treatment and comparison groups.

[17] In the panel, treated observations were allowed to repeat in order to link with multiple untreated observations; however, each untreated observation is only allowed to link with one treated observation and thus only appears in the panel for a single 9-year period (i.e., from three years prior until five years after "treatment"). Untreated observations are weighted as $n/1$, with n representing the total number of untreated communities that were linked to a given community from the treatment group.

[18] While not included in this paper, regression results from robustness checks and sensitivity analyses are available upon request. The spatial sensitivity analysis—in which the geographic "buffer zone" around downtown is expanded and contracted—uses the same 1,314 observations as the main analysis.

¼-mile buffer zone, many of the estimates became statistically insignificant. This suggests that the phenomenon I am measuring is indeed spatially confined to the hyper-local downtown business district rather than occurring throughout the entire municipality.

Second, I used an alternative method to assign quasi-treatment years to the comparison group. Rather than use GIS to compute a nearest-neighbor assignment, I used the geography of the commuting zone to assign the same treatment year of each treated observation to all of the untreated observations within the same CZ.[19] While not identical, the point estimates and statistical significance of the regressions using the "CZ-stack" comparison group closely follow that of the regressions using the nearest-neighbor comparison group displayed below. This suggests that my identifying assumption—that communities within commuting distance share common trends in labor market outcomes—is robust to multiple approaches for comparing treated and untreated observations.

Finally, I divide the main analysis—which uses data pooled from four states—into smaller *subsample* analyses to focus on each state individually. The development and outreach efforts of the Main Street Program are orchestrated by a national coordinating body, but the authority behind public funding and accountability reside at the state level. This renders the program susceptible to state-wide differences in implementation, according to the vision and agency of the state director. As such, a DD model using data pooled from all four states may produce estimated *average* treatment effects that mask meaningful between-state heterogeneity. Even with community fixed effects—which control for time-invariant differences, including the community's home state—the pooled DD model will only estimate a useful average treatment effect if there are no systematic differences in the way the program is implemented. Thus, I use state-level subsamples to estimate heterogeneous treatment effects for each of the four states in the analysis.

5. Results

Table 3 displays the results of the main analysis using data pooled from communities in Iowa, Michigan, Ohio, and Wisconsin. In the table, each odd-numbered column corresponds to difference-in-differences regressions where the estimator is specified as an average effect for the "post" treatment years. The even-numbered columns correspond to the event-study DD regressions which decompose the treatment effect into relative-year terms. Columns 1, 3, and 5 are all positive, which, if statistically significant, would suggest an overall positive causal link between MSP adoption and each downtown vitality outcome. However, the standard errors for each estimate are quite large, and none of the three estimates are statistically significant.

[19] For CZs with multiple treated observations, the untreated observations were allowed to repeat so that each untreated observation was linked with each treated observation once. Rather than the one-to-one linkage in the nearest-neighbor method, this alternative method created a "stack" of duplicated untreated observations, each linked with a different treated observation in the CZ. Allowing treated observations to match with more than one untreated observation increased the total number of observations in the analysis from 1,314 to 2,682.

Table 3: Impact of the MSP on Three Downtown Indicators

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Jobs (per 1,000)		Retail Jobs (per 1,000)		Retail Estabs. (per 1,000)	
Treated * Post	-0.8		4.7		0.3	
	(12.4)		(9.6)		(0.7)	
Treated * Year 3 Prior		22.7		-14.5		0.0
		(15.7)		(16.1)		(0.6)
Treated * Year 2 Prior		15.6		-12.4		-0.1
		(11.7)		(14.5)		(0.3)
Treated * Baseline Year		-4.1		-2.7		0.1
		(12.0)		(4.9)		(0.6)
Treated * Year 1 Post		3.0		-0.0		0.1
		(13.8)		(8.0)		(0.6)
Treated * Year 2 Post		7.6		3.3		0.1
		(12.9)		(11.0)		(0.5)
Treated * Year 3 Post		-1.9		-0.9		0.5
		(18.0)		(15.0)		(0.8)
Treated * Year 4 Post		4.0		-0.4		0.6
		(19.7)		(15.9)		(0.9)
Treated * Year 5 Post		2.5		1.0		0.8
		(12.2)		(17.5)		(1.1)
County-Level Controls?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,314	1,314	1,314	1,314	1,314	1,314
R^2	0.56	0.54	0.44	0.41	0.54	0.57

* p<0.10, ** p<0.05, *** p<0.01

Furthermore, the event-study estimates—which likewise all lack statistical significance—are not consistent over time, especially for downtown jobs, the central outcome of this study.[20] Figure 3 is a graphical representation of the results displayed in Columns 4 and 6 of Table 3, and the shaded area represents the error bands around each estimate. While the trendline for retail jobs hovers close to zero, the trendline for retail establishments does increase over time. However, the standard errors for the retail establishments estimates also increase over time, and thus the estimated effect on retail establishments is statistically null.

For the reasons mentioned above, I supplement the pooled multi-state analysis with four additional single-state analyses. The results of the analyses corresponding to Michigan, Ohio, and Wisconsin generally replicate the results of the pooled multi-state analysis, as no clear or statistically significant effects remain consistent throughout the regressions.[21] For instance, the estimates for total downtown jobs in Michigan and Ohio are not statistically significant during the entire event-study period. Similarly, the event-study estimates for downtown retail establishments in Ohio are only significant during the "Year 3 Prior" and "Year 2 Prior" terms, both of which are negative. These estimates imply a null effect of the MSP in Michigan, Ohio, and Wisconsin. The estimates for total downtown jobs in Wisconsin *are* positive and statistically significant for the "Year 5 Post" relative-year period, which suggests that MSP adoption may lead to an estimated 27 new jobs (per 1,000 residents; hereafter referred to as "per-1K") in the fifth year of program participation. However, this finding is weakly supported by the rest of the estimates for Wisconsin, which were inconsistent across event-study time periods and the other measured outcomes.

This is not the case for Iowa. For three of the four studied outcome variables—total downtown jobs, downtown retail jobs, and downtown retail establishments—I estimate a positive treatment effect in the years following program adoption. These findings are presented in Table 4, which also includes an additional outcome variable, retail sales per-capita, which I explain in more detail below. Table 4 shares the same formatting as the previous table, and standard errors are clustered by community rather than by state. The results in Table 4 are graphically represented in Figure 4, and statistically significant estimates are denoted as dark-grey circles. The "Year 4 Post" relative-year estimate for total downtown jobs in Iowa was positive and weakly statistically significant, indicating that, for participating communities in rural Iowa, the Main Street Program generates around 40 new downtown jobs per-1K in the years after adoption.

[20] To conserve space, Table 3 only includes results for three of the four outcome variables in this study: total downtown jobs, downtown retail jobs, and downtown retail establishments. The results for *total downtown establishments* are available in Appendix E. The "Treated*Post" estimate of total downtown establishments is significant and negative, indicating that the MSP leads to a loss of 1.4 establishments (per 1,000 residents). However, in the event study the "Treated * Year 3 Prior" is positive and weakly significant while all estimates for the years *after* treatment lack statistical significance. This indicates a violation of the parallel trends assumption—i.e., that prior to treatment there was a systematic difference in outcomes between treated and untreated observations—and indicates that the model is unreliable.

[21] As Iowa was the only state to demonstrate any consistency across the various outcome variables in the analysis, the individual-state analyses for Michigan, Ohio, and Wisconsin are only available in Appendix E. I do not include the single parameter "Treated*Post" estimates in Appendix E, as they contain less information and, like the estimates of the pooled multi-state analyses, are not statistically significant.

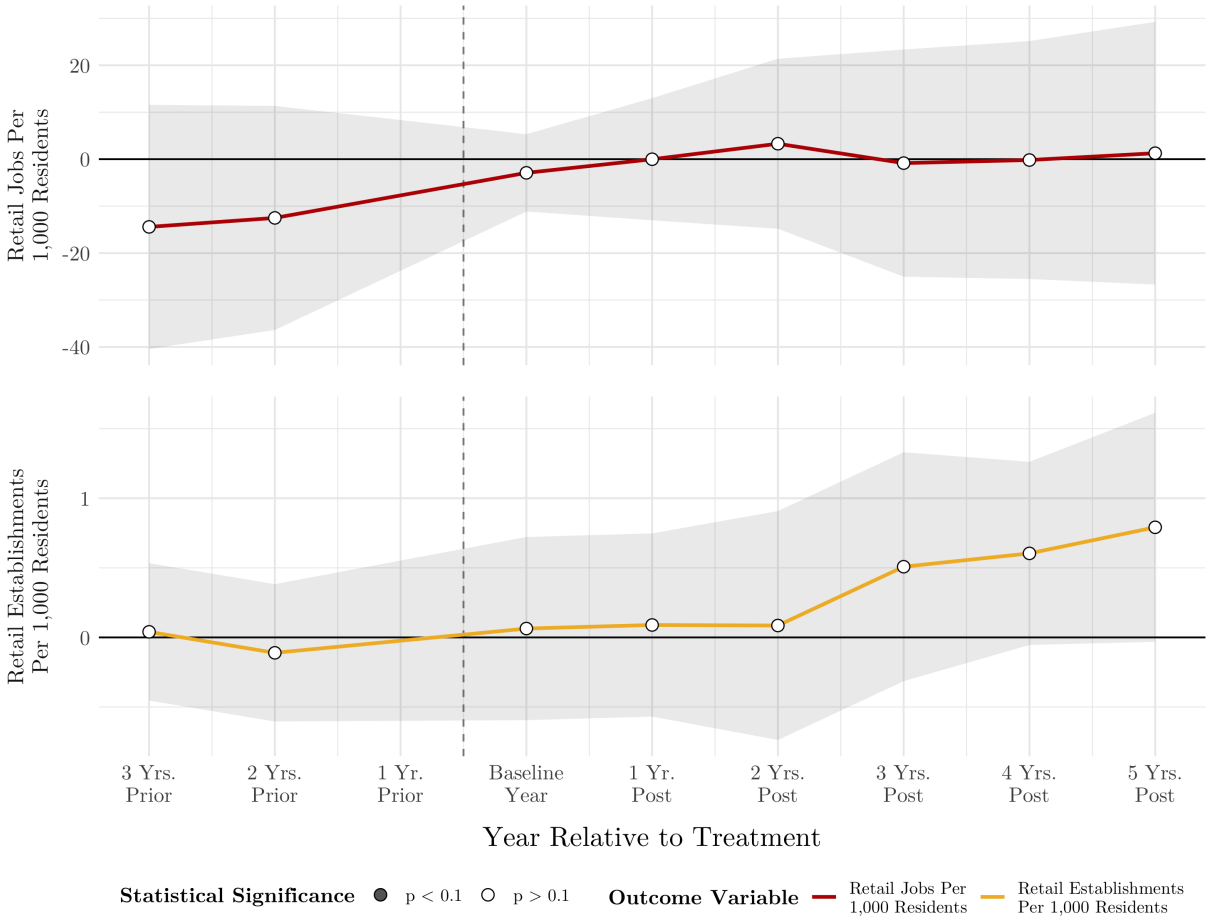

Figure 3: Impact of the MSP on Downtown Retail Jobs & Establishments

Table 4: Impact of the Main Street Program in Iowa

	(1) Total Jobs (per 1,000)		(2) Retail Jobs (per 1,000)		(3) Retail Estabs. (per 1,000)		(4) Retail Sales Per-Capita	
Treated * Post	21.7		20.3*		1.3**		479.1*	
	(19.6)		(11.2)		(0.6)		(264.2)	
Treated * Year 3 Prior		7.1		2.4		0.8		133.9
		(12.8)		(8.3)		(0.7)		(208.8)
Treated * Year 2 Prior		-0.5		-2.3		-0.2		39.3
		(13.7)		(8.2)		(0.5)		(203.8)
Treated * Baseline Year		14.9		6.2		0.9		-121.1
		(11.8)		(8.2)		(0.9)		(141.7)
Treated * Year 1 Post		20.3		12.5		0.8		317.6
		(17.2)		(10.3)		(0.7)		(201.9)
Treated * Year 2 Post		17.8		20.6**		0.8		646.4**
		(20.6)		(9.5)		(0.9)		(250.6)
Treated * Year 3 Post		27.0		22.4*		1.6		655.1***
		(21.2)		(13.0)		(1.0)		(234.5)
Treated * Year 4 Post		43.5*		25.1*		1.8**		688.9*
		(23.9)		(14.3)		(0.8)		(374.1)
Treated * Year 5 Post		22.7		26.2*		2.3**		586.6
		(21.6)		(15.0)		(0.9)		(451.1)
County-Level Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	459	459	459	459	459	459	1,332	1,332
R^2	0.63	0.71	0.35	0.33	0.59	0.63	0.59	0.59

* p<0.10, ** p<0.05, *** p<0.01

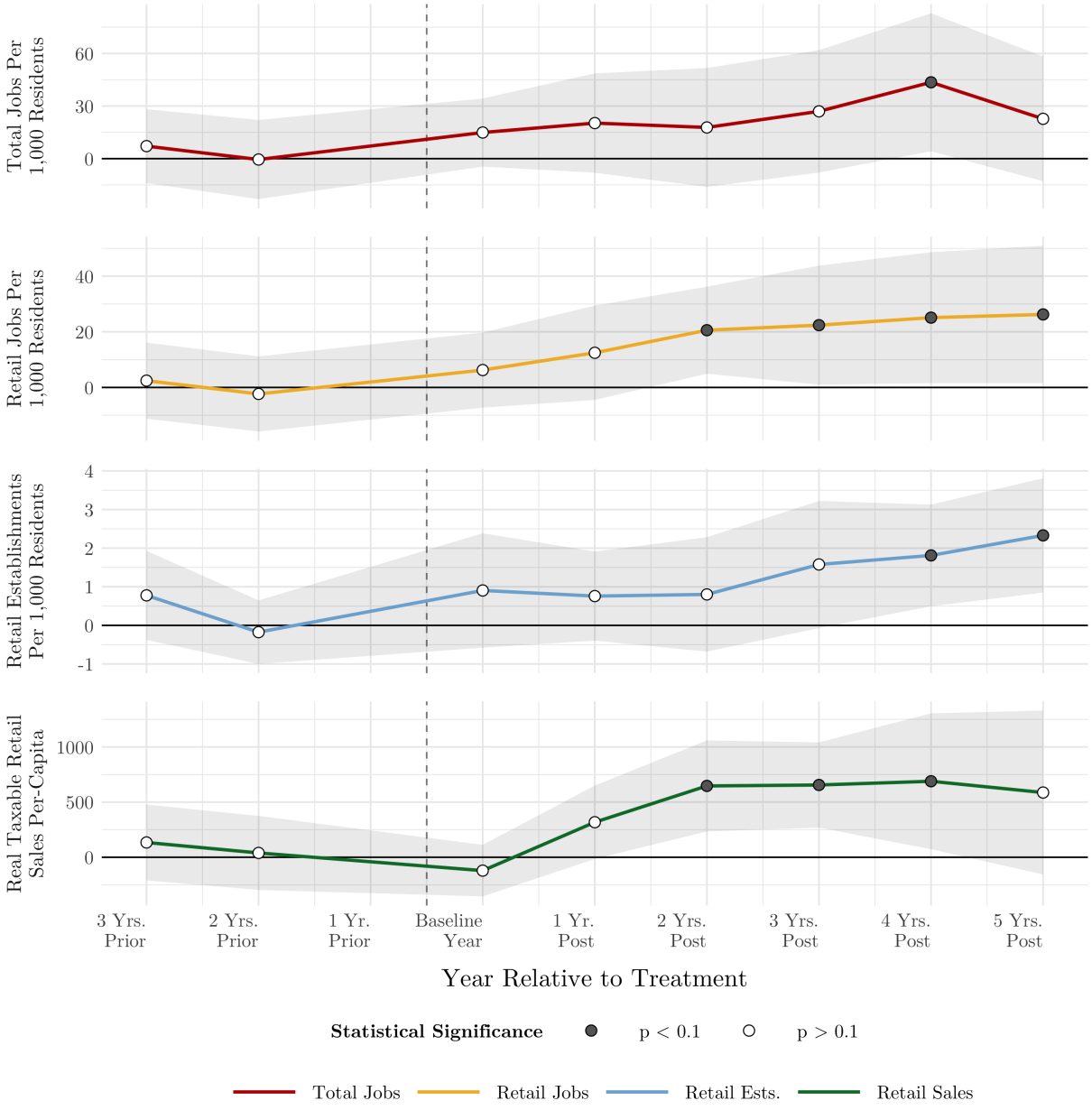

Figure 4: Impact of the MSP on Four Economic Outcomes in Iowa

In addition to the positive estimates for total downtown jobs (Table 4, Column 2), the *retail* jobs and establishments event-study estimates (Table 4, Columns 4 and 6) possessed an even higher degree of statistical significance and were significant for multiple years of the event study. Together, the two analyses indicate that MSP adoption causes an increase in roughly 20 downtown retail jobs and 2 downtown retail establishments (both per-1K) in the years following adoption.

Due to the strong and consistent retail effects in Iowa, I included an additional outcome variable in the analysis, which should provide additional context to these findings. I repeated the same regression models as before, this time substituting *real taxable retail sales per-capita* as the outcome variable. Ideally, this additional variable would be repeated for the other three states and included a part of the main findings. However, of the four states, only the Iowa Department of Revenue makes their "Retail Sales and Use Taxes Annual Reports" publicly available by municipality for each fiscal year. Similar to the retail jobs and establishments analyses, the results (Table 4, Column 8) indicate that taxable retail sales are likewise positively affected by Main Street Program adoption, on the order of an additional $650 per resident.[22] However, one important caveat is that the retail sales data are *not* confined to the downtown or "Main Street" district within the observed community. This means that—while the estimates still indicate a causal link between MSP adoption and retail sales—the resulting sales may be occurring anywhere within the taxable jurisdiction of the municipality.

6. Discussion & Conclusion

The primary objective of this study was to identify the causal relationship, if any, between participation in the Main Street Program and improved economic vitality in rural downtowns. To accomplish this, I implemented a difference-in-differences design which estimates the program's impact on job and establishment growth in downtown retail districts across communities in Iowa, Michigan, Ohio, and Wisconsin. When looking all four states together, I find no statistically significant effects of MSP adoption in any of the examined outcomes (total downtown jobs and establishments, as well as downtown retail jobs and establishments).

However, when inspecting each state separately, Iowa is clearly singular from its peers, in that the Main Street Program does indeed produce the expected economic benefits to the downtowns of communities participating in the program. For communities in rural Iowa, MSP participation generates approximately 20 new downtown retail jobs per 1,000 residents and 2 new downtown retail establishments per 1,000 residents in the 5-year period following program adoption. Additionally, while not the primary focus of this study, the MSP's effect on retail also extends to local sales, as

[22] The number of observations (1,332) in the real taxable retail sales per-capita analyses are nearly triple the number of observations in the other analyses for Iowa (459). This is because sales tax data were available as far back as 1976 from the Iowa Department of Revenue and the "Iowa Community Indicators Program" hosted by Iowa State University. Because the earliest Iowa MSP adopter (Dubuque) joined the program in 1985, the sales data allow for a complete picture of the program's historical impact on retail sales from the beginning. As Dubuque and some of the other early Iowa MSP adopters (e.g., Cedar Falls and Waverly) technically belong to metropolitan statistical areas, I do not impose the same *rural-only* restrictions on observations in the Iowa taxable sales regression, which also contributes to the larger N value. Ultimately, the analysis of retail sales in Iowa is an *ancillary* analysis which primarily serves to support the finding of a robust effect of the MSP on downtown retail in Iowa.

MSP participation leads to an additional $650 in taxable retail sales per resident across the entire municipality.

6.1 Implications

To my knowledge, this is the first study to apply causal inference techniques to estimate the economic impact of the Main Street Program. As mentioned above, the MSP is a uniquely challenging object of study due to its small size and scale, poor administrative capacity for data-collection, and wide geographic dispersion of program participants. Nevertheless, this study reveals three main implications for MSP directors and downtown revitalization practitioners as a whole, each of which I discuss in greater detail in the paragraphs below.

First, the results of this study indicate that the Main Street Program may not be a universally successful approach to rural downtown revitalization. Outside of Iowa, the Main Street Program does not exhibit any consistent or statistically significant causal impact on the downtown economic vitality outcomes measured in this analysis. That is not to say that the Iowa-specific findings are trivial—they are certainly not—but rather, this study's overall findings suggest a lack of generalizability for the program across state lines.

In their seminal case study of program implementation, Pressman and Wildavsky (1973) described the difficult circumstances involved as the U.S. Economic Development Administration (EDA) attempted to implement a new program to create jobs and alleviate unemployment in the late 1960s. Although the program was ultimately deployed in Oakland California—a high-poverty urban enclave surrounded by the otherwise prosperous Bay Area regional economy—it was originally designed by the EDA to address poverty throughout the economically depressed Appalachian region, which comprised 362 counties in ten states. Among their many critiques of the EDA program, Pressman and Wildavsky emphasize the irrationality of attempting to implement a program in the Oakland setting when it was originally designed to address the needs and context of a large multi-state region.[23]

The parallel between the Oakland program and the findings of this study is that the Main Street Program is also developed and coordinated at the national level rather than being specifically tailored by each state as a "home grown" revitalization strategy.[24] Policy scholars have long decried the "one-size-fits-all approach to implementation" (Long and Franklin, 2004), emphasizing the need to design flexible programs that are appropriate for different settings (Radin, 2000), even at the expense of centralized control. Because states have discretion in how they implement and administer the MSP (see Table 1), it is unfair to label the program as purely a "one-size-fits-all" approach.

[23] Pressman and Wildavsky refer to Appalachia as a "depressed region" which they contrast with Oakland, CA by referring to it as a "distressed neighborhood" (p. 152). The authors highlight the "weakness of the economic base" throughout Appalachian states, while noting that the "urban ghetto" is often located in close proximity to some of the highest value real estate in the county. The decision to highlight these stark differences in geographic and economic context underlie the authors argument that program implementation is anything but "one size fits all."

[24] To be sure, the National Main Street Center (NMSC) does not have an authoritative mandate over the higher-level decisions made regarding state and community Main Street Programs, such as budgeting and personnel. However, the program is nonetheless coordinated nationally and the NMSC receives funding through membership dues and annual conference fees.

However, the top-down features of the program—such as national standards for accreditation—may act as barriers to successful program performance. Rural communities are already familiar with the necessity of tailoring minimalist federal policies to their particular local context (Swanson, 2001), and the National Main Street Center (NMSC) may benefit from encouraging additional "bottom-up" implementation practices (Sabatier, 1986) that are custom-made to take advantage of regional heterogeneity.

Second, the null finding from the pooled multi-state analysis highlights the value of using a *variety* of outcomes to operationalize the concept of economic vitality. Downtown jobs and establishments (including the retail-only varieties) are only two of a wide possible range of measures of local economic vitality. In another study (see Van Leuven, 2021), I focus on an additional operationalization of economic vitality—residential property values—to evaluate the MSP as a downtown revitalization strategy. I measure the influence of downtown proximity on the sale price of nearby homes and find that homebuyers place an additional premium on properties that are located in close proximity to a downtown business district with an active Main Street Program. Other potential measures of economic vitality include wages, personal or household incomes, gross regional product, and commercial property values. In sum, any decisive conclusions regarding the efficacy of the MSP must "triangulate" its impact and should reflect the analysis of multiple operationalizations of economic vitality. Whereas a revitalization program may generate new downtown jobs and establishments in one community, in a different geographic locale it may only generate higher property values, with little to no effect on jobs. Economic development practitioners should be cognizant that approaches to revitalization typically do not behave uniformly, and as such should not be judged according to an identical set of metrics.

Finally, it cannot be overlooked that the Main Street Program was indeed successful at restoring the economic vitality of rural downtowns across the state of Iowa. While the previous paragraphs discuss the lack of generalizable impacts in a national context, the findings in Iowa suggest that, in the right context, the program *does* work. Although this paper does not explore the specific mechanisms underlying the heterogeneous treatment effects, there are a few plausible explanations for the MSP's success in Iowa. Of the four states in this study, Iowa was the first to adopt the program. When towns in Wisconsin first started adopting the MSP in 1988, Iowa already had six active MSP participants (Ohio and Michigan adopted the program much later, in 2000 and 2003 respectively). As one of the earlier adopters, Iowa may possess an advantage over other states, having more experienced practitioners and more time for trial and error.[25]

[25] Furthermore, Iowa's MSP may behave differently from the MSPs of the other states due to its administrative structure at the state level (see Table 1). In Ohio, the MSP is coordinated by a non-profit organization, and in Wisconsin and Michigan, the MSP is coordinated by state-affiliated independent agencies. Thus, as the only state where the MSP is coordinated by an official state agency, Iowa's positive causal effects (see Table 4) may be partially explained by its unique administrative structure.

Additionally, Iowa has a number of characteristics that set it apart in terms of economic geography.[26] Unlike the other three states in the analysis, Iowa has no regional economies that can compare to Detroit, Milwaukee, or Cleveland with a metropolitan population above one million, and Iowa has only one (Des Moines) with a population above 500,000. This results in a "flatter" state population distribution, consisting of a higher number of smaller, non-metropolitan regional economies centered around small towns, like those highlighted in this study. Berry (1967) explains that Iowa's settlement pattern—a product of rectangular land-use surveying and the 19th-century development of the railroad system—is key in interpreting the state's relatively unique geography of retail market centers.[27]

Regardless of whether Iowa is uniquely situated to benefit more from the Main Street Program relative to the other states considered in this study, the inferred state-level heterogeneity is central to the findings of this study. While focusing on heterogeneous treatment effects diminishes the external validity of the analysis, the reality is still relevant to researchers and policymakers that—in the right context—the MSP can still generate the economic revitalization outcomes that it was designed to achieve.

6.2 Limitations & Future Directions

There are several limitations to this analysis. First, aside from the generalizability concerns described above, the analysis is restricted to only four of the 40+ states with participating MSP communities. Future extensions of this study may include additional states, such as Missouri or Nebraska, that share similar economic and geographic characteristics with Iowa. Another limitation is that the business establishment data used in this study were collected informally by a private firm and may not reflect the same accuracy as public sector datasets, such as the Quarterly Census of Employment and Wages (QCEW).[28] While future extensions of this study may benefit from use of administrative microdata, the Infogroup dataset is recognized by regional scientists and planners as a suitable indicator of local business dynamics (Meltzer et al., 2020).

Third, the method used for manual geocoding of downtown districts is not replicable, as it depends in part on user judgment—which may be deemed by some as arbitrary—to determine where a community's "downtown" district begins and ends. In future extensions of this research, I plan to develop a more data-driven technique to create a comprehensive spatial delineation file of downtown business districts. Fourth, this study does not account for the permanence (or lack thereof) of the

[26] One time-varying source of spatial heterogeneity that is *not* accounted for in empirical analysis is the structure of regional employment by industry sector. In Appendix F I implement a robustness check that controls for annual county fluctuations in the manufacturing and agriculture industry sectors. Even when controlling for regional industrial structure, the results of the main analysis (i.e., Table 3 and Table 4) were largely unaffected in terms of magnitude and statistical significance.

[27] Berry observed that Iowa was unique among other states, as it appears to strongly exhibit the phenomenon known to economic geographers as "central place theory" (Von Thünen, 1826; Christaller, 1933; Losch, 1954), which seeks to explain the spatial distribution and hierarchical structure of local economies, based on population and market size.

[28] The longitudinal business establishment data are collected primarily from the yellow pages and phone verification surveys (Lavin, 2000), and the dataset is updated annually by Data Axle (formerly named Infogroup).

jobs and business establishments that result from the adoption of the MSP. An important future extension of this study may focus on the life span of downtown businesses to observe whether new establishments and jobs can "survive" (Deller and Conroy, 2017; Renski, 2008) through economic downturns and become enduring elements of the downtown district's commercial fabric.

Finally, this paper's focus on a causal inference design leads to a tacit trade-off between precision and interpretation. As Keane (2010) remarked about "atheoretic" quasi-experimental approaches, despite the added clarity of a precise causal estimate, it is "not at all clear or intuitive" what exactly is the underlying factor that "drives" that estimate. Keane's observation is certainly true with regards to this study: I have identified a number of causal relationships between MSP adoption and downtown jobs in Iowa, but I am unable to definitively interpret what is unique about Iowa's implementation of the MSP that "drives" such a finding. A beneficial future extension of this research would incorporate case studies that investigate the MSP across multiple states, highlighting "best practices" (and *worst* practices), as well as the use of alternative (i.e., non-MSP) economic development programs at the state level. While such a study would provide a further, more nuanced glimpse into the practice of downtown revitalization in the rural United States, the analysis in this paper nonetheless provides a crucial first step in the process of evaluating the Main Street Program and its effect on local economic vitality.

6.3 Conclusion

Seen as a potential remedy for decades of disinvestment and physical deterioration in historic town centers, the Main Street Program has been adopted by over 1,000 rural communities throughout the United States. Since its rise in the 1980s, many scholars have studied the MSP to identify its impact and influence on phenomena such as architectural design and historic preservation. However, during this time scholars were not focused on investigating the program's causal impact on local economic vitality, and this study is among the first to precisely estimate the effect of MSP adoption on downtown job and business establishment growth.

As small-town mayors and city managers mull their options for how they might stem the tide of economic decline, they and other stakeholders must be equipped with the evidence to guide their decision-making. The results of this study support the claim that downtown revitalization efforts such as the Main Street Program can, under the right circumstances, create new jobs and business establishments, especially in the retail sector. However, my findings also cast doubt on the ability of the Main Street Program to serve as a *universal* approach to downtown revitalization. These findings underscore the importance of studying multiple operationalizations of economic vitality to triangulate the program's true impact and demonstrate the value of paying close attention to the nuances of program implementation and local context.

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Appendices

A. Main Street Transformation Strategies

Table A.1: Main Street Program Transformation Strategies

Strategy	Description
Economic Vitality	Focuses on capital, incentives, and other economic and financial tools to assist new and existing businesses, catalyze property development, and create a supportive environment for entrepreneurs and innovators that drive local economies
Design	Supports a community's transformation by enhancing the physical and visual assets that set the commercial district apart.
Promotion	Positions the downtown or commercial district as the center of the community and hub of economic activity, while creating a positive image that showcases a community's unique characteristics.
Organization	Involves creating a strong foundation for a sustainable revitalization effort, including cultivating partnerships, community involvement, and resources for the district.

Source: National Main Street Center (NMSC) Website

Figure A.1: Main Street Program Transformation Strategies

Note: Graphic and language from table are both taken directly from the National Main Street Center (2021) website.

B. Single-State Summary Statistics (Panel Variables Only)

Table B.1: Summary Statistics, by State

	Mean	Std. Dev.	Min	Max
Iowa (n = 459)				
Calendar Year	2007	4.6	1997	2017
Rural-Urban Continuum Code	6.3	1.2	4	9
Treatment (MSP Adopted?)	0.2	0.4	0	1
Downtown Jobs	914.1	1,214.4	3	8,252
Downtown Jobs Per 1k	127.7	122.0	3	620
Downtown Establishments	191.9	89.8	2	493
Downtown Establishments Per 1k	30.8	13.6	2	69
Michigan (n = 306)				
Calendar Year	2008	4.3	2000	2017
Rural-Urban Continuum Code	5.4	1.5	4	9
Treatment (MSP Adopted?)	0.2	0.4	0	1
Downtown Jobs	989.5	1,089.0	40	5,842
Downtown Jobs Per 1k	134.5	111.4	12	589
Downtown Establishments	226.8	195.9	16	1,285
Downtown Establishments Per 1k	32.9	21.6	5	111
Ohio (n = 405)				
Calendar Year	2006	3.9	1997	2014
Rural-Urban Continuum Code	5.1	1.2	4	7
Treatment (MSP Adopted?)	0.1	0.3	0	1
Downtown Jobs	1,207.8	1,155.5	20	5,511
Downtown Jobs Per 1k	153.1	126.1	6	554
Downtown Establishments	178.5	129.1	17	1,115
Downtown Establishments Per 1k	23.4	11.7	5	66
Wisconsin (n = 144)				
Calendar Year	2007	4.0	1997	2016
Rural-Urban Continuum Code	5.6	1.7	4	9
Treatment (MSP Adopted?)	0.2	0.4	0	1
Downtown Jobs	1,224.2	1,000	82	4,509
Downtown Jobs Per 1k	160.7	102.2	17	385
Downtown Establishments	193.8	127.0	39	585
Downtown Establishments Per 1k	28.9	20.9	8	104
N	1,314			

C. Summary Statistics for Communities Inside/Outside of Analysis

These two tables compare two sets of observations pulled from the study universe, which consists of a total of 494 municipalities. Table C.1 examines the characteristics of the communities that are included in the main analysis (n = 146). Table C.2 examines the same characteristics for communities that were dropped from the main analysis due to a lack of data availability (n = 348). Because 1997 is the first available year of data availability in the Infogroup dataset, there are 348 communities in the study universe that are not included in the main analysis.

Table C.1: Summary Statistics (Communities Included in Analysis)

	Mean	Std. Dev.	Min	Max
Population (2010)	6,325	6,888	776	36,837
Percent Non-White (2010)	6.2%	6.0%	1%	32%
Median Age (2010)	38.9	5.0	22	56
Median Household Income (2010)	$40,743	$7,846	$24,054	$72,258
Rural-Urban Continuum Code	5.6	1.4	4	9
Treatment (MSP Adopted?)	0.2	0.4	0	1
MSP Adoption Year (if applicable)	2007	3.7	2000	2012
N	146			

Table C.2: Summary Statistics (Communities Not Included in Analysis)

	Mean	Std. Dev.	Min	Max
Population (2010)	5,042	5,586	758	41202
Percent Non-White (2010)	5.8%	5.6%	1%	55%
Median Age (2010)	40.3	5.4	22	56
Median Household Income (2010)	$39,995	$8,004	$16,691	$65,893
Rural-Urban Continuum Code	6.1	1.5	4	9
Treatment (MSP Adopted?)	0.1	0.3	0	1
MSP Adoption Year (if applicable)	2002	11.6	1986	2018
N	348			

D. Use of Geographic Information Systems in Data and Analysis

Figure D.1 is a side-by-side illustration of Defiance, OH without (left) and with (right) the line-string used to denote the spatial extent of the downtown district. A line-string is a one-dimensional spatial object consisting of a sequence of points and the line segments that connect them. Hand-coding each downtown line-string relied on aerial imagery to identify the approximate point at which a street's concentration of downtown buildings and sidewalks gives way to less-dense land uses. Once the downtown line-string was coded, a GIS buffer operation was used to generate a polygon—extending ⅛ mile in all directions from the line-string—which denotes the "downtown district."

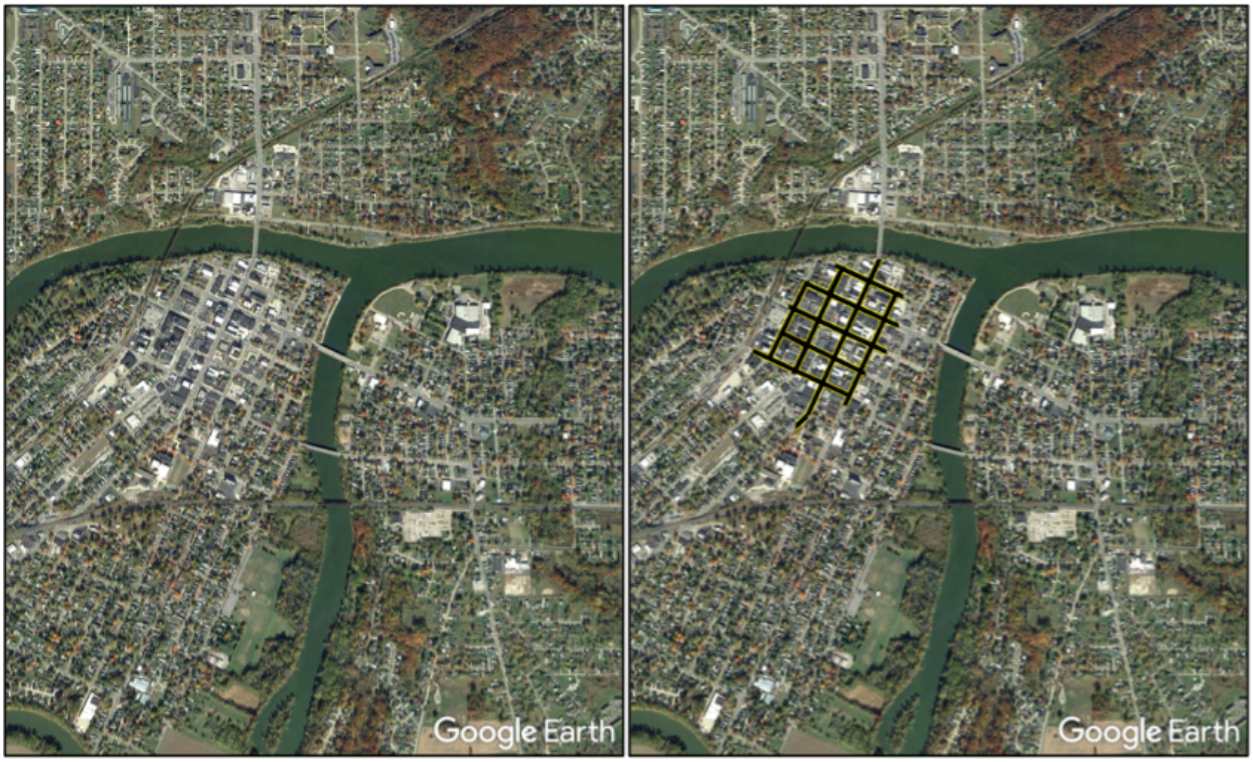

Figure D.1: Defiance, OH Geocoded Downtown Line-String Example (Right Image)

Figure D.2 uses the Google Maps "Street View" tool to compare the density of buildings on either side of a parking lot located along the primary retail corridor in Defiance, OH. Facing north, the "downtown" cluster of storefronts and civic buildings is visible; however, when facing south, the streetscape becomes less dense, with more residential land uses and deeper building setbacks. The parking lot is thus an example of the outer edge of the manually geocoded downtown district, which roughly approximates the extent to which a street's concentration of downtown buildings and sidewalks gives way to less-dense land uses.

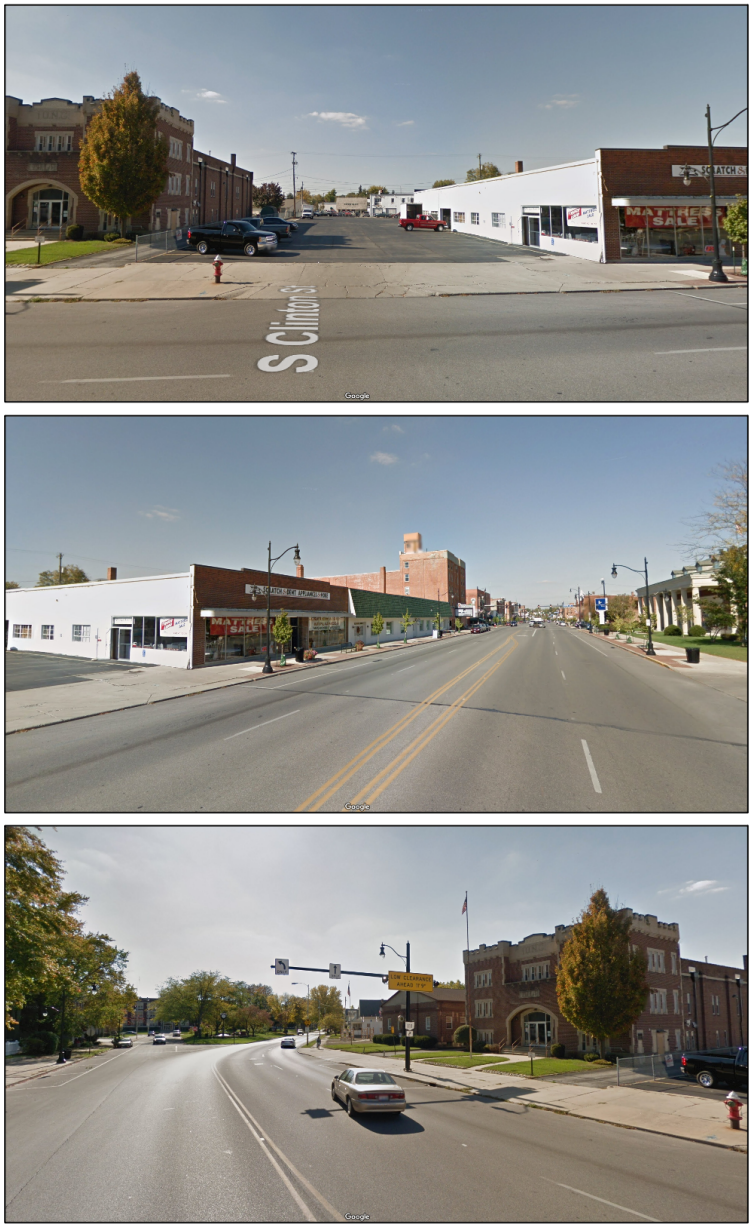

Figure D.2: Retail Corridor Building Density Comparison, Defiance, OH

E. Combined and Single-State Regressions

As Iowa was the only state to demonstrate any consistency across the various outcome variables in the analysis, the individual-state analyses for Michigan, Ohio, and Wisconsin were not included in the main text of the study. This appendix does not include the single parameter "Treated*Post" estimates as they contain less information and, like the estimates of the pooled multi-state analyses, are not statistically significant.

All tables include five columns, including the "pooled" sample of all four states (Column 1), and a column for each individual state. All regressions include the county-level control variables discussed in Section 3, and all regressions use the event-study model specification. For pooled sample regressions, standard errors are clustered by state, and for all state sub-sample regressions, standard errors are clustered by community.

Table E.1: Jobs Per 1,000 Residents (Pooled + By State)

	(1) Pooled	(2) Iowa	(3) Michigan	(4) Ohio	(5) Wisconsin
Treated * Year 3 Prior	23.06	7.14	9.62	73.56*	-9.83
	(16.0)	(12.8)	(22.1)	(42.2)	(13.9)
Treated * Year 2 Prior	15.45	-0.50	7.17	55.61	-7.30
	(11.9)	(13.7)	(10.4)	(40.8)	(17.3)
Treated * Baseline Year	-4.60	14.90	-30.00	-3.24	3.12
	(11.7)	(11.8)	(31.0)	(9.3)	(14.2)
Treated * Year 1 Post	3.11	20.28	-25.99	17.55	-17.43*
	(13.7)	(17.2)	(30.1)	(23.1)	(9.5)
Treated * Year 2 Post	7.49	17.78	-19.72	32.63	1.97
	(12.9)	(20.6)	(33.1)	(21.6)	(21.2)
Treated * Year 3 Post	-1.59	26.97	-30.94	10.26	-3.73
	(18.1)	(21.2)	(36.7)	(21.9)	(12.7)
Treated * Year 4 Post	4.71	43.54*	-24.49	2.43	-3.47
	(19.9)	(23.9)	(37.8)	(18.8)	(12.5)
Treated * Year 5 Post	3.54	22.70	-24.68	13.63	21.83*
	(12.7)	(21.6)	(37.4)	(20.9)	(11.0)
Observations	1,314	459	306	405	144
R^2	0.54	0.71	0.75	0.27	0.82

* p<0.10, ** p<0.05, *** p<0.01

Table E.2: Establishments Per 1,000 Residents (Pooled + By State)

	(1) Pooled	(2) Iowa	(3) Michigan	(4) Ohio	(5) Wisconsin
Treated * Year 3 Prior	2.73***	2.59**	0.59	5.54*	1.94
	(0.9)	(1.2)	(0.7)	(2.9)	(2.4)
Treated * Year 2 Prior	2.20**	1.38	0.97	5.51*	0.53
	(0.9)	(1.2)	(0.7)	(3.0)	(1.1)
Treated * Baseline Year	0.04	1.46	-1.81	0.13	0.63
	(0.8)	(1.5)	(1.6)	(0.5)	(1.7)
Treated * Year 1 Post	-0.33	0.31	-1.42	1.10	0.97
	(0.8)	(1.6)	(1.8)	(1.3)	(2.3)
Treated * Year 2 Post	-0.93	-1.40	-0.43	0.77	0.18
	(1.1)	(2.0)	(1.8)	(0.9)	(2.5)
Treated * Year 3 Post	-0.46	0.36	-1.78	1.07	-0.76
	(1.2)	(2.4)	(1.5)	(1.0)	(0.6)
Treated * Year 4 Post	-0.15	1.40	-0.95	-1.15	-1.30*
	(1.2)	(2.4)	(1.8)	(1.2)	(0.7)
Treated * Year 5 Post	-0.14	0.54	-1.04	-1.22	1.86*
	(1.3)	(2.5)	(1.8)	(1.5)	(0.9)
Observations	1,314	459	306	405	144
R^2	0.68	0.75	0.79	0.52	0.73

* p<0.10, ** p<0.05, *** p<0.01

Table E.3: Retail Jobs Per 1,000 Residents (Pooled + By State)

	(1) Pooled	(2) Iowa	(3) Michigan	(4) Ohio	(5) Wisconsin
Treated * Year 3 Prior	-14.42	2.45	-19.91	-43.62***	-49.25
	(15.8)	(8.3)	(17.3)	(12.7)	(40.8)
Treated * Year 2 Prior	-12.51	-2.33	-0.23	-45.56*	-43.98
	(14.5)	(8.2)	(6.7)	(26.1)	(31.0)
Treated * Baseline Year	-2.91	6.25	-5.87	-1.68	-38.57
	(5.0)	(8.2)	(8.0)	(6.3)	(45.1)
Treated * Year 1 Post	-0.01	12.46	-5.90	-1.60	-43.35
	(7.9)	(10.3)	(9.6)	(5.6)	(36.8)
Treated * Year 2 Post	3.29	20.58**	-1.10	-5.86	-33.18
	(11.0)	(9.5)	(7.0)	(14.0)	(42.1)
Treated * Year 3 Post	-0.84	22.39*	-3.24	-13.70	-43.04*
	(14.7)	(13.0)	(5.8)	(11.8)	(24.5)
Treated * Year 4 Post	-0.18	25.09*	-5.06	-20.47*	-21.87*
	(15.4)	(14.3)	(7.3)	(12.0)	(12.1)
Treated * Year 5 Post	1.28	26.24*	-14.04	-18.19***	2.23
	(17.0)	(15.0)	(9.2)	(6.6)	(10.3)
Observations	1,314	459	306	405	144
R^2	0.41	0.33	0.47	0.44	0.81

* p<0.10, ** p<0.05, *** p<0.01

Table E.4: Retail Estabs. Per 1,000 Residents (Pooled + By State)

	(1) Pooled	(2) Iowa	(3) Michigan	(4) Ohio	(5) Wisconsin
Treated * Year 3 Prior	0.04	0.78	-0.33	-1.21***	-0.38
	(0.3)	(0.7)	(0.6)	(0.4)	(0.3)
Treated * Year 2 Prior	-0.11	-0.18	0.52	-0.70	-0.73**
	(0.3)	(0.5)	(0.3)	(0.4)	(0.3)
Treated * Baseline Year	0.06	0.90	-1.14*	0.29	-0.93
	(0.4)	(0.9)	(0.6)	(0.2)	(1.0)
Treated * Year 1 Post	0.09	0.76	-1.25	0.48	-0.13
	(0.4)	(0.7)	(0.8)	(0.3)	(0.8)
Treated * Year 2 Post	0.09	0.80	-0.91	0.38	-0.95**
	(0.5)	(0.9)	(1.1)	(0.2)	(0.4)
Treated * Year 3 Post	0.51	1.58	-0.63	0.33	-0.97***
	(0.5)	(1.0)	(0.7)	(0.3)	(0.3)
Treated * Year 4 Post	0.60	1.81**	-0.69	0.45	-1.00***
	(0.4)	(0.8)	(0.8)	(0.4)	(0.3)
Treated * Year 5 Post	0.79	2.33**	-0.71	-0.09	-0.84
	(0.5)	(0.9)	(0.9)	(0.5)	(0.6)
Observations	1,314	459	306	405	144
R^2	0.57	0.63	0.62	0.51	0.81

* p<0.10, ** p<0.05, *** p<0.01

F. Regional Industrial Structure Robustness Check

With the use of community-level fixed effects, all sources of time-invariant spatial heterogeneity are controlled for in the base model. One *time-varying* source of spatial heterogeneity is the structure of regional employment by industry sector. The four tables in this appendix demonstrate how the estimates of the base model change when accounting for annual county fluctuations in prominent industry sectors: manufacturing and agriculture.

To control for the time-varying structure of the regional manufacturing industry, I used the ratio of manufacturing jobs to total nonfarm jobs in a given county and year. I collected data from the Bureau of Economic Analysis (BEA) "Employment by Industry" series and lagged the variable by one year.

To control for the time-varying industry structure of local agriculture, I used the ratio of farm earnings to total personal income in a given county and year. Unlike manufacturing, controlling for farming in terms of employment is nearly impossible due to the prevalence of unpaid family farm labor and the fact that farmers often hold non-farm jobs. Especially in a state like Iowa, agricultural employment is seasonal, as proprietors may only need to hire workers for a few weeks per year. Thus, the ratio of farm earnings to total personal income is a better measure of the time-varying impact of farming on the local (county) economy.

I used the two industry control variables to test the robustness of the Iowa state subsample regression models (Table 4 in the main text). Each table represents a different key outcome variable: total downtown jobs, downtown retail jobs, downtown retail establishments, and downtown retail sales. Each table has four columns: the base model (no industry control variables), agriculture controls only, manufacturing controls only and both industry control variables together.

Neither industry control variable was consistently statistically significant when added to the base regression model, and their inclusion in the regression largely did not alter the results of the base analysis. One exception is the "Treated * Year 3 Post" and "Treated * Year 5 Post" estimates for downtown retail jobs; the inclusion of the manufacturing industry control variable caused a small decrease in the point estimates while their standard errors remained the same. This suggests that some weakly significant estimates of the base model are not robust to alternate specifications. However, the majority of effect estimates from the initial findings were *not* affected when controlling for regional industrial structure.

Table F.1: Jobs Per 1k (Iowa) w/Industry Structure Controls

	(1)	(2)	(3)	(4)
Treated * Year 3 Prior	7.1	7.0	9.2	9.0
	(12.8)	(12.8)	(12.1)	(12.0)
Treated * Year 2 Prior	-0.5	-0.3	2.4	2.8
	(13.7)	(13.6)	(13.2)	(13.2)
Treated * Baseline Year	14.9	15.2	15.2	15.6
	(11.8)	(12.1)	(11.8)	(12.2)
Treated * Year 1 Post	20.3	20.4	19.6	19.7
	(17.2)	(17.1)	(17.0)	(16.9)
Treated * Year 2 Post	17.8	17.9	18.7	18.9
	(20.6)	(20.6)	(21.5)	(21.5)
Treated * Year 3 Post	27.0	26.8	26.5	26.3
	(21.2)	(21.2)	(22.0)	(21.9)
Treated * Year 4 Post	43.5*	43.1*	41.7*	41.0*
	(23.9)	(24.1)	(24.3)	(24.5)
Treated * Year 5 Post	22.7	22.2	20.9	20.1
	(21.6)	(21.9)	(22.0)	(22.4)
Agriculture Industry Controls	No	Yes	No	Yes
Manufacturing Industry Controls	No	No	Yes	Yes
Observations	459	459	459	459
R^2	0.714	0.714	0.720	0.720

* p<0.10, ** p<0.05, *** p<0.01

Table F.2: Retail Jobs Per 1k (Iowa) w/Industry Structure Controls

	(1)	(2)	(3)	(4)
Treated * Year 3 Prior	2.4	2.6	4.3	4.4
	(8.3)	(8.6)	(8.7)	(8.9)
Treated * Year 2 Prior	-2.3	-2.6	0.3	0.1
	(8.2)	(8.0)	(8.7)	(8.5)
Treated * Baseline Year	6.2	5.9	6.5	6.3
	(8.2)	(7.8)	(8.1)	(7.9)
Treated * Year 1 Post	12.5	12.4	11.9	11.8
	(10.3)	(10.3)	(9.9)	(10.0)
Treated * Year 2 Post	20.6**	20.5**	21.4**	21.3**
	(9.5)	(9.4)	(10.2)	(10.2)
Treated * Year 3 Post	22.4*	22.5*	22.0	22.1
	(13.0)	(13.1)	(13.2)	(13.2)
Treated * Year 4 Post	25.1*	25.6*	23.4*	23.8*
	(14.3)	(14.4)	(13.9)	(13.9)
Treated * Year 5 Post	26.2*	26.8*	24.6	25.0*
	(15.0)	(15.0)	(14.8)	(14.8)
Agriculture Industry Controls	No	Yes	No	Yes
Manufacturing Industry Controls	No	No	Yes	Yes
Observations	459	459	459	459
R^2	0.335	0.336	0.357	0.357

* p<0.10, ** p<0.05, *** p<0.01

Table F.3: Retail Estabs. Per 1k (Iowa) w/Industry Structure Controls

	(1)	(2)	(3)	(4)
Treated * Year 3 Prior	0.78	0.77	0.79	0.79
	(0.69)	(0.69)	(0.71)	(0.71)
Treated * Year 2 Prior	-0.18	-0.17	-0.15	-0.15
	(0.51)	(0.50)	(0.51)	(0.50)
Treated * Baseline Year	0.90	0.91	0.91	0.91
	(0.92)	(0.92)	(0.92)	(0.93)
Treated * Year 1 Post	0.76	0.76	0.75	0.76
	(0.72)	(0.72)	(0.72)	(0.72)
Treated * Year 2 Post	0.80	0.80	0.81	0.81
	(0.88)	(0.88)	(0.88)	(0.88)
Treated * Year 3 Post	1.58	1.57	1.57	1.57
	(0.98)	(0.98)	(0.98)	(0.98)
Treated * Year 4 Post	1.81**	1.80**	1.80**	1.79**
	(0.82)	(0.82)	(0.82)	(0.82)
Treated * Year 5 Post	2.33**	2.32**	2.32**	2.30**
	(0.93)	(0.93)	(0.93)	(0.93)
Agriculture Industry Controls	No	Yes	No	Yes
Manufacturing Industry Controls	No	No	Yes	Yes
Observations	459	459	459	459
R^2	0.632	0.632	0.632	0.632

* p<0.10, ** p<0.05, *** p<0.01

Table F.4: Retail Sales Per-Capita in Iowa w/Industry Structure Controls

	(1)	(2)
Treated * Year 3 Prior	133.9	152.1
	(208.8)	(210.2)
Treated * Year 2 Prior	39.3	31.8
	(203.8)	(207.0)
Treated * Baseline Year	-121.1	-126.7
	(141.7)	(142.6)
Treated * Year 1 Post	317.6	303.6
	(201.9)	(200.2)
Treated * Year 2 Post	646.4**	649.9**
	(250.6)	(250.2)
Treated * Year 3 Post	655.1***	657.0***
	(234.5)	(227.1)
Treated * Year 4 Post	688.9*	705.3*
	(374.1)	(367.3)
Treated * Year 5 Post	586.6	608.4
	(451.1)	(450.1)
Agriculture Industry Controls	No	Yes
Manufacturing Industry Controls	No	No
Observations	1,332	1,332
R^2	0.592	0.594

* p<0.10, ** p<0.05, *** p<0.01

Note: Years of data availability for retail sales per capita did not align with data availability years for agricultural industry controls. Only the manufacturing industry controls are used for this iteration of the analysis.