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The Determinants and Consequences of Foreign Direct Investment

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by

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DEDICATION

This dissertation is dedicated to my family. Michael, you have sacrificed opportunities and many weekends for my academic endeavors. Without your unwavering support and belief in my abilities, none of this would have been possible. Henry and Noah, you are my inspiration. Through the toughest times, you both keep me going. I want you both to know that if you follow your dreams, stay focused, and believe in your own abilities, you can accomplish anything that you set your mind to. Last but not least, this work is also dedicated to my parents. You have always been my biggest cheerleaders. Without your endless encouragement and free, no questions asked babysitting, this endeavor would have taken many more years to complete.

ABSTRACT

This dissertation examines the regional economic effects of foreign direct investment (FDI). FDI is known to have benefits for both national and regional economies. These benefits include an increasing number of higher paying jobs, productivity spillovers for local firms, and elevated economic development (SelectUSA, 2020). Many governments compete to attract large FDI projects, often through the use of controversial incentive packages. Incentives are criticized because it is not clear that they affect the location of FDI and furthermore, whether the benefit of incentives outweigh the costs (Bartik, 2018).

In the first paper, I assess the impact of incentives on the location of manufacturing FDI within the United States relative to other fundamental determinants. I find that agglomeration economies are among the most significant location factors. Localization economies have an elasticity of 0.92 while urbanization economies have an elasticity of 1.31. Additionally, I find that the corporate income tax rate has an elasticity of -0.46 while the investment tax credit has an elasticity of 1.56. In the second paper, I test the influence of culture and FDI in Eastern Europe. Culture has long been recognized as an important determinant of business location decisions; however, culture is difficult to disentangle from other factors (Beugelsdijk et al., 2011). In this paper I measure culture through a historical affiliation with the Habsburg Empire. This allows me to employ a regression discontinuity design to explore the effect of culture on the spatial allocation of FDI along the historical empire border. As no other characteristic impacting

FDI changes along the border, any observed differences in FDI are interpreted as causal effects of cultural ties on the location of FDI. The results suggest that there are between 0.24 and 0.32 additional investments per 10,000 individuals coming from Habsburg-affiliated countries in the former empire territories of Romania and Serbia today.

In the last paper, I examine the effect of FDI in rural counties in the United States. Using a combination of quasi-experimental techniques, I determine the effect of FDI on personal income and employment growth. I find limited evidence on the efficacy of targeting FDI for economic development.

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LIST OF ABBREVIATIONS

CDM ..... Count Data Model

FDI ..... Foreign Direct Investment

ROW ..... Rest of the World

CHAPTER 1

INCENTIVES AND THE LOCATION OF FOREIGN MANUFACTURING INVESTMENT IN THE UNITED STATES

Section 1.1: Introduction

Revitalizing U.S. manufacturing remains a paramount policy goal for national and regional economic development. The outsourcing of manufacturing investment and rising import penetration are ongoing concerns, with scholarly research uncovering adverse impacts across U.S. regions (Autor et al., 2016). In contrast, inward foreign direct investment (FDI) augments factory employment and the U.S. manufacturing capital stock. The United States consistently attracts large FDI inflows. Among the industry sectors that receive investment, manufacturing attracts the highest share of inward FDI. In 2018, the stock of manufacturing FDI reached 1.8 trillion dollars, comprising more than 40 percent of total foreign direct investment in the United States (OFII, 2018). This trend is expected to continue, as manufacturing FDI continually experiences one of the highest growth rates of any sector at 9 percent per year (U.S. Department of Commerce, 2017).

Policy makers promote favorable tax breaks and incentives to steer new investment to particular regions. This paper examines the effect of these policies on greenfield FDI in manufacturing. New, or greenfield plant investment, requires an

explicit location choice, while other types of FDI such as mergers and acquisitions have no new location decision. Regional policy makers target greenfield FDI because of perceived benefits for the host economy, notably the prospect of boosting high-wage employment. A recent study finds that wages for foreign enterprises are 25 percent higher than average wages for domestic firms, controlling for industry and location (Setzler and Tintelnot, 2019). This same study suggests that the wage premium generated may even justify or outweigh the incentive received.

Given the controversy over incentives, it is important to understand the effect that incentives have on the location decisions of firms. States and localities compete fiercely with each other, attempting to draw in new investment and expand the employment base (Zhuang, 2016). In the regional development literature, incentives are generally seen as distorting market decisions and are largely considered to be wasteful (Bartik, 2017). Yet, regional development incentives in the United States show no signs of abating. Business incentives almost tripled nationwide from 1990 to 2015. In some states, incentives are restricted to manufacturing. Moreover, incentives are typically larger for manufacturing than for other sectors (Bartik, 2017).

This paper investigates how incentives compare with fundamental location determinants of manufacturing like agglomeration economies. In the United States, the Midwest/Great Lakes and Southeast regions dominate manufacturing agglomeration. Accordingly, I focus on the U.S. regions where there is the greatest intensity of manufacturing agglomeration and fierce incentive competition among states. According to the Institute for Competitiveness (2018), in 2015 Indiana had the highest share of manufacturing employment (17.6 percent), followed by Wisconsin and Michigan. In the

Southeast, Alabama leads as the state with the highest share of manufacturing employment (13.6 percent), followed by Kentucky and South Carolina. I test both state and county-level location determinants within the primary manufacturing regions of the United States: the traditional “industrial heartland" agglomeration in the Midwest and the ascending manufacturing agglomeration in the South.

This research uses two unique databases to identify FDI in manufacturing and regional incentives: fDi Markets and the Bartik Panel Database. fDi Markets, a database maintained by the *Financial Times*, tracks cross-border greenfield investment. It identifies the specific location of foreign investment by industry. The Bartik panel database captures specific regional incentives and tax breaks offered to manufacturing firms (Bartik, 2017).

Based on these databases, this study is the first to isolate the importance of incentives relative to agglomeration and other fundamental location factors in drawing firms to locate in a particular state. I estimate a panel Poisson specification with random effects to model the state and county-level determinants of foreign manufacturing investment in the Southeast and Midwestern United States.

The results suggest that agglomeration economies are among the most significant factors in the manufacturing location decision. Specifically, urban agglomeration economies as captured by the wage premium, have an elasticity of 1.32 percent. Local industry agglomeration (localization), as modeled by the number of domestic manufacturing establishments have an elasticity of 0.92 percent. Secondly, state taxes and incentives can matter. Among the taxes and incentives considered in this model, I find that the corporate income tax and the investment tax credit have the biggest potential

influence on the location decision. A one percent increase in the corporate income tax rate as a percentage of the value-added decreases the expected number of FDI projects by 0.46 percent while a one percent increase in the investment tax credit as a percentage of the value added increases the expected number of FDI projects by 1.56 percent. Other taxes and incentives considered, which have no measurable effect on the location decision of firms, are the sales and property tax, the job creation and research and development tax credit, and the customized job training subsidy.

The rest of the paper is organized in the following manner. Section 1.2 reviews the agglomeration and recent economic development incentive literature. In Section 1.3 I explain the Poisson regression model, while section 1.4 describes the data that underlie the model's estimates. Sections 1.5 and 1.6 put forth the state and county hypotheses that are tested in the model and Section 1.7 presents the results. Section 1.8 introduces some possible extensions of the model. Finally, Section 1.9 concludes.

Section 1.2: Literature Review

Foreign manufacturing firms continually invest in the U.S. because the country offers a large, integrated, relatively stable, safe, and growing market. In making their plant location decision, firms must then choose specific sites within broad U.S. regions that offer varying competitive advantages for profitable production. That is, location decision makers often concentrate on choices within particular U.S. regions, not the nation as a whole. Within specific regions, firms and their site selection consultants screen for profit-maximizing local characteristics such as agglomeration and development incentives (Woodward, 2012). Often, agglomeration is fundamental in the

location decision of firms, as has been extensively studied and confirmed in the regional science literature.

Section 1.2.1: Agglomeration

Agglomeration refers to the spatial concentration of firms and workers beyond what would be expected in a given area. It is expected that regions with high industry agglomeration will benefit from positive externalities of being in close proximity to other firms and workers. Research across many different fields, including labor economics, industrial organization, international business, and economic history have shown that industrial clusters raise worker productivity. Additional positive externalities include increasing returns to scale which allow firms and workers to generate more output with the same amount of inputs in larger, denser regions. These benefits of agglomeration typically offset the cost of congestion, pollution, and other negative externalities that may occur through regional agglomeration (Henderson, 1974). The literature defines agglomeration in two ways, industry localization and urbanization economies.

Section 1.2.1.1: Establishment and Localization Economies

Localization economies refer to positive spillovers that a firm can benefit from by locating within a cluster of local business establishments in a particular industry. Most of the previous studies find positive and significant effects of localization economies on the location decision.

In an early study examining the determinants of manufacturing FDI, Coughlin et al. (1991) find that the primary force driving the location decisions of FDI is agglomeration as captured by the manufacturing density in a given state. Later studies

examining Japanese FDI confirm these findings. Woodward (1992) implements a conditional logit model to estimate the probability of site selection at both the state and county level, using data from the Japan Economic Institute. Once a particular state is chosen, it is evident that Japanese investors are drawn by existing manufacturing agglomerations as well as highly educated and productive workers. Using the same database Head et al. (1995) examine the location decisions of Japanese manufacturing firms in the United States. They pay special attention to the effect of agglomeration economies on the location decision. They test several agglomeration variables including local manufacturing clusters of domestic and Japanese establishments as well as clusters of manufacturing establishments in bordering states. They find that a 10 percent increase in any of the agglomeration variables tested increases the probability of Japanese investment by 5 to 7 percent, even after controlling for state specific effects, state time trends, and industry-level stocks and flows of domestic investment. However, their results also show that for Japanese investors, an agglomeration of Japanese manufacturing activity outweighs the importance of domestic manufacturing agglomeration. In another study of Japanese manufacturing location decisions, Smith and Florida (1994) test the impact of several measures of agglomeration along with other location characteristics. They explore the idea that many Japanese investors cluster in certain areas to take advantage of “just-in-time" production, a business practice aimed at promoting efficiencies related to transportation costs. To accomplish this goal, the authors test the effect of distance to the nearest Japanese automotive assembly plant, as well as the number of “Big Three" domestic automotive assemblers within 250 miles of a given county. As in previous research, they also test the manufacturing density as

measured by the percentage of a county's labor force employed in manufacturing. They find strong evidence of the importance of agglomeration economies across all models tested. Other studies that examine FDI from all countries in the United States find similar effects. Zhuang (2014) and Zhuang (2016) examine the location decisions of greenfield FDI. Zhuang (2014) analyzes the location decisions of foreign manufacturers at the state level. He finds that manufacturing FDI is attracted to areas with a higher density of manufacturing establishments. Zhuang (2016) analyzes the location decisions of all greenfield FDI at the MSA level. The results also suggest that new investment is attracted to areas with a high share of manufacturing and service activity.

The importance of agglomeration is also documented in other types of location studies. In a study examining why headquarters move, Strauss-Kahn and Vives (2009) find that an agglomeration of headquarters in the same industry have a significant effect on the probability of relocating a firm's headquarters in every specification tested. A ten percent increase in the number of headquarters in the same industry increases the probability of choosing a location by 6.7 percent. These are just several examples of the many instances of the importance of localization economies in previous research. Even more supportive evidence of this can be found in studies including Luger and Shetty (1985), Friedman et al., (1992), Guimaraes et al., (2000), List (2001), and Gabe and Bell (2004). While localization consistently stands out as a contributing factor in drawing new investment, urbanization economies are perhaps even more important in the location decisions of firms (Arauzo-Carod et al., 2010).

Section 1.2.1.2: Urbanization Economies

Urbanization economies refer to the more general spillovers that firms can benefit from that are generated through the interaction of various industries and clusters within a given region. It is noted by previous studies that firms also receive benefits from urban agglomeration, or the activities of a diverse set of firms and services that occur in an area that may not necessarily be related to a specific industry (Arauzo-Carod et al., 2010). One of the ways in which this is demonstrated is through the urban wage premium.

Areas with higher wages may reflect the positive spillover effects of urban agglomeration. Notably, researchers consistently discover that urban wages reflect higher productivity (Yankow, 2006). The urban wage premium could also stem from the selection of workers into areas based on their abilities and career choices (Gould, 2007). The higher skills and productivity of workers are embodied in higher regional average wages. Studies show that at the firm level, foreign firms typically pay higher wages than domestic firms (Doms and Jensen, 1998, Feliciano and Lipsey, 1999, Setzler and Tintelnot, 2019). Setzler and Tintelnot (2019) show that most of this premium can be attributed to higher worker skill. However, they also find that there is no discernible difference in wage premiums between foreign firms and domestic multinational firms suggesting that the wage premium can also be explained by the higher productivity of such firms as well as the “tangible and intangible foreign inputs" these firms may have access to.

In empirical studies, the effect of wages on the location decisions of firms is mixed. Some older studies consistently find that wages have a negative effect on the location decisions of firms (Luger and Shetty, 1985, Coughlin et al., 1991, Friedman et

al., 1992, Luker, 1998, Coughlin and Segev, 2000, List and Mchone, 2000, List, 2001, Strauss-Kahn and Vives, 2009). However, some studies find a positive and significant effect of wages on the location decision of firms. Smith and Florida (1994) perform a county level analysis of the determinants of Japanese manufacturing investment in the United States. Using a measure of the average annual wage for production workers in the manufacturing industry, they find a positive and significant effect of wages across all models considered. In this study, the authors did not expect to find a negative effect of wages on the location decisions of firms because they note that Japanese firms typically offer high wages to ensure labor force stability and to develop higher levels of human capital. Head et al. (1999) examine Japanese manufacturing investment in the United States from 1980-1992. They use a measure of the average state manufacturing wage. In their base specification, the effect of wages is negative and insignificant. Once they control for agglomeration, wages become positive and statistically significant. The authors state that these results could reflect the variation in the skill composition of the work force. Guimaraes et al. (2000) examine the location decisions of foreign firms in Portugal. Using an index of manufacturing wage rates in Portugal, the authors find a positive effect of wages on location decisions of firms. In some specifications of the model, the results are significant. The authors suggest that these results could be explained by the fact that higher wages may not deter investors at the local level, rather they would deter investors at the country level. Zhuang (2014) and Zhuang (2016) find that higher wages across U.S. states appear to have a positive effect on attracting FDI. He finds that higher wages increase FDI, while standard measures of agglomeration also matter for manufacturing. Clearly, the most consistent factor found to influence FDI

location is agglomeration. This paper aims to not only confirm these findings but more importantly to test the relative importance of agglomeration in comparison to local incentives offered, the effect of which has yet to be determined.

Section 1.2.2: Development Incentives and Taxation

Are firms influenced by incentives, or would they locate in a particular area regardless of the incentives offered? Incentives are frequently offered because they are believed to enhance economic development outcomes. If incentives are successful in attracting firms, they may expand local jobs and raise wages, as well as increase the tax revenue for the community. However, these local economic benefits must be weighed against the cost of incentives and the possibility that they will diminish spending on state and local government services. Additionally, there is the risk that the firms will not deliver on promises for the employment and investment, as exemplified by the infamous Taiwan-based Foxconn flat panel investment in Wisconsin (Bartik, 2018). While there has been some research on the effect of incentives and taxation on the location decision of firms, their effects are not well established in the FDI literature.

As summarized by Peters and Fisher (2004), early studies conducted before 1980 found that incentives had at best a marginal impact on the firm location decision and did not significantly alter the spatial distribution of firms. Over time, with improvements in econometric modeling, researchers are now better able to model the influence of taxes and incentives on location. More recent studies conclude that taxes and incentives, may affect regional and local economic growth. The taxes considered in past studies are per capita property taxes (Guimaraes et al., 2004), as well as other measures including state and local income tax, unemployment tax, severance taxes, and business fees and licenses

(McConnell and Schwab, 1990). Generally, these studies find that higher levels of taxation have a negative effect on the locational probability of investment. Some studies assess incentives through other measures such as subsidies offered (Head et al., 1999) or state promotion expenditures (Coughlin et al., 1991). Some researchers construct indices that attempt to measure state "effort" by combining measures of job training subsidies, business climate indicators, and expenditures on investment attraction and retention (Luger and Shetty, 1985).

Recent research examines the impact of particular policies such as the Empowerment Zone Program (Hanson and Rohlin, 2011) and the New Markets Tax Credit Program (Harger and Ross, 2016) on employment and job creation. These studies find positive effects for incentives in particular industries such as the service and retail industries. Similarly, recent studies also examine the impact of the Tax Increment Financing Program (TIF) on the number of jobs created (Byrne, 2018) and the impact of "deal-closing" funds, such as Arkansas' Quick Action Closing Fund (QACF) on job establishment and growth (Bundrick and Snyder, 2018). These researchers find that targeted incentives do not have a statistically significant impact on employment or offer the widespread benefits promised by the programs. Within these modern studies that have only examined particular incentive programs, there is at best minimal evidence that incentives affect the business location decision. In a recent review of the incentive literature, Bartik (2018) finds that most studies overestimate the importance of incentives. Based on the most recent studies, he concludes that incentives only alter the investment decision of firms 2 to 25 percent of the time. Clearly, the importance of incentives in the location process is still under debate, especially concerning the effect that these programs

could have on the attraction of FDI. The precise effect of incentives is difficult to determine because often the incentive variables tested in location models are rough proxies, cover short time periods, or are only available for very small sample sizes. Through the availability of the Bartik database, this study aims to bridge this gap by estimating the impact of the overall tax profile affecting medium to large export-oriented firms in a particular state. I not only consider the effect of three taxes but also incorporate the effect of five different incentives on the location decisions of firms.

Section 1.3: Model

The aim of this analysis is to assess how location characteristics, such as incentives or agglomeration affect new foreign manufacturing investments in a given county of the Midwestern and Southern regions of the United States. I choose to focus on these regions as these are the most probable location choices for a greenfield manufacturing firm. Figure 1.1 shows domestic manufacturing intensity throughout the country as measured by the location quotient. A higher location quotient, more specifically a location quotient above one, represents a higher density of manufacturing firms relative to other types of firms in the United States. As shown in the map, the Midwest (Minnesota, Wisconsin, Michigan, Illinois, Indiana, and Ohio) is particularly intensive in domestic manufacturing. Figure 1.2 shows the intensity of foreign manufacturing investment at the state level as measured by the location quotient. From this map, it is obvious that the Southeast stands out when it comes to foreign manufacturing investment. Historically, this area has often offered large incentive packages in order to lure potential investors. As such, my model will examine location characteristics in the Southeast and Midwest. The states included in the Southeast are

Alabama, Florida, Louisiana, South Carolina, North Carolina, Georgia, Virginia, Tennessee, and Kentucky. In the Midwest, the relevant states are Michigan, Indiana, Ohio, Minnesota, Illinois, Missouri, and Wisconsin. As a result, the model will feature a choice set of 1,491 possible counties across sixteen states. With manufacturing FDI projected to expand, notably in the Southeast and Midwest/Great Lakes regions, it will continue to represent a major force in economic development.

The most popular model used in empirical location studies to analyze location choice is a Count Data Model (CDM) (Arauzo-Carod et al., 2010). I also implement a CDM approach because the dependent variable is the count of new foreign investments in a given county.

I estimate a panel Poisson regression with random effects. Under this analysis, the determinants of the firm location decision can be empirically estimated by calculating how changes in location characteristics affect the conditional expectation of the number of firms created in a particular county *i* in state *k* at time *t.* To derive marginal effects, it is assumed that the probability mass function of y_{ikt} is Poisson distributed. Along with these assumptions, the model also implies that the first two moments are $E(Y\_ikt) = \lambda_{ikt}$ and $V(Y\_ikt) = \lambda_{ikt}$ respectively. In count data it is not uncommon to find that the variance is larger than the mean; or in other words, the data are overdispersed. Overdispersion introduces similar problems as heteroskedasticity in ordinary least squares regressions. Tests reveal that my data are overdispersed. Estimating the model using robust standard errors can correct for this issue. When dealing with overdispersion, the model can be estimated using a negative binomial specification or estimated using a Poisson specification with robust standard errors. If the aim of the analysis is prediction,

a negative binomial is preferred over the Poisson. Instead, if the aim of the analysis is to model the conditional mean, the Poisson specification is preferred. The Poisson model will retain its consistency even if the count is not Poisson distributed provided that the conditional mean function is correctly specified (Cameron and Trivedi, 2013). For these reasons, I estimate a Poisson model using robust standard errors that are clustered at the county level.

The Poisson model also has several advantages that make it a preferred method in this analysis. First, it is capable of handling a large choice set. Other studies that use discrete choice methods, such as a conditional logit model, model the location choice at highly aggregated levels such as U.S. states which typically contain a lot of heterogeneity within them (Coughlin et al., 1991, Friedman et al., 1992, Head et al., 1999). This is problematic for two reasons. First, many relevant location factors, such as agglomeration and labor market characteristics, occur at the local level (Guimaraes et al., 2004). Second, in discrete choice models, only the locations that are chosen contribute to the likelihood function whereas under a CDM approach, the unchosen locations not only contribute to the likelihood function but they can importantly provide interesting insights (Arauzo-Carod et al., 2010). Finally, in some cases the Poisson model can also circumvent the Independence of Irrelevant Alternatives (IIA) assumption, which rarely holds under a conditional logit specification (Gabe and Bell, 2004). Because of these advantages, newer location studies have frequently used a CDM approach to model the firm location decision.

Section 1.3.1: Location Model

Under this model, the probability of attracting a new foreign firm is assumed to be a function of both state and county location characteristics such that,

$$Prob(Invest_{ikt}) = f(X_{ikt}, Z_{kt}),$$

Where $Invest_{ikt}$ represents the number of new investments made in county *i* in state *k* in year *t,* while X_{ikt} and Z_{kt} represent county and state characteristics that affect a given firm's spatial profit function respectively (List, 2001). Following Hausman et al., (1984), the Poisson parameter will be denoted as λ_{ikt}, where $\ln(\lambda_{ikt}) = X_{ikt}\beta + Z_{kt}\varphi$. Given these assumptions, the basic panel Poisson probability specification can be modeled as follows:

$$Prob(Y_{ikt} = Invest_{ikt}) = \frac{e^{-\lambda_{ikt}}\lambda_{ikt}^{Invest_{ikt}}}{Invest_{ikt}!}$$

Given the panel structure of the data, there may be serial correlation. To correct for this and estimate a more precise model, fixed or random effects are often used in regression analysis. In a fixed effects model, it is assumed that any unobservable factors that may impact the estimation are time invariant. A fixed effects model would not be appropriate in this case due to a lack of variation within the counties included in the dataset. Moreover, I am interested in understanding the effect of particular time invariant location characteristics. For these reasons, I estimate a panel Poisson model with random effects. Under a random effects specification, the Poisson parameter is specified as $\widetilde{\lambda_{\imath kt}} = \lambda_{ikt}\widetilde{a_{\imath k}}$ where $\widetilde{a_{\imath k}}$ is a random county specific effect. Following Hausman et al., (1984), $\widetilde{\lambda_{\imath kt}}$ will take the following form:

$$\widetilde{\lambda_{ikt}} = \lambda_{ikt} a_{ik} = e^{X_{ikt}\beta + Z_{kt}\varphi + \mu_0 + \mu_{ik}},$$

where μ_{ik} is the county specific effect and μ_0 is the overall intercept. The Poisson probability specification then becomes:

$$Prob(Y_{ikt} = Invest_{ikt}) = \frac{e^{-\lambda_{ikt} e^{\mu_{ik}}} (\lambda_{ikt} e^{\mu_{ik}})^{Invest_{ikt}}}{Invest_{ikt}!}$$

The basic panel Poisson model that is estimated takes the following form:

$$Invest_{ikt} = a_{ik} + X_{ikt-1}\beta + Z_{kt-1}\varphi + \rho_{ik} + \gamma_k + \delta_t + \epsilon_{ikt},$$

where *Invest* represents the count of foreign manufacturing investments in county *i* in state *k* at time *t.* As previously stated, investment is assumed to be a function of both county and state characteristics denoted by X_{ikt-1} and Z_{kt-1} respectively. All state and county characteristics are entered as logs in the equation. To avoid taking the log of 1, I add 1 to all tax and incentive variables. I assume a prospective firm at time *t* takes into account all relevant location specific characteristics as of time (*t-1).* Variables that do not vary over time, such as county land area, are not lagged. Additionally, state taxes and incentives are not lagged as these "packages" are determined in the year in which the investment is made. Including a lag in the model for many of the area specific characteristics should also control for any possible endogeneity between these factors and investments in a given year. The main specification also controls for several time invariant county specific factors, ρ_{ik}, a set of state dummies, γ_k, to account for any unobservable or unmeasureable characteristics that may make a state more attractive to investors, as well as a set of year dummies, δ_t, to account for any factors that may differentially impact FDI in a given year.

Section 1.4: Data

Estimation of the model requires information regarding foreign location decisions as well as state and county characteristics. Firm investment data come from fDi markets, a database maintained by the *Financial Times*, that includes cross-border greenfield investment information from 2003-2015. This database is unique in the level of detail that it offers. This data set includes the specific location of investment projects down to the city level. The database also identifies investor specific characteristics such as the name and origin of the investing company, the industry of the investment project by NAICS code, as well as the size of the investment as measured by the number of jobs created and the amount of capital invested.

This study considers the effect of five different incentives and three different taxes that are relevant to manufacturing firms relative to fundamental determinants of FDI like agglomeration. The Bartik database includes the main state and local business taxes offered to firms such as business property taxes, state and local sales taxes on business inputs, and taxes on corporate income and state gross receipts. The included taxes represent over two-thirds of the total state and local tax burden a typical medium to large sized-export oriented manufacturing firm would face (Bartik, 2017). The incentives that I consider include the job creation tax credit, investment tax credit, research and development credit, property tax abatement, and the customized job training subsidy. Similarly, the incentives that are included are not all encompassing, rather they represent the incentives a manufacturing firm is most likely to face. The focus of this database is on medium to large export-oriented firms as these are the ones that typically receive the most economic development dollars. The data are available by industry and are based on

a simulation of taxes and incentives a given firm would face if they decided to open a new facility in a particular state in a particular year. In the simulation, the present value of taxes and incentives is calculated using a 12 percent discount rate. This rate is selected based on the previous literature, which suggests that firms place a higher value on short term factors rather than long term factors. The database has the capability to simulate the tax and incentive rates a firm would experience in its first 20 years of operation. As I am only interested in the initial tax climate faced by an incoming firm, the simulation only runs for one year in the model. In order to calculate each of the tax and incentive rates, the database employs a hypothetical firm balance sheet. This balance sheet includes industry averages for the value-added, pre-tax profits, property asset mix, employment, wages, and R&D spending. Using this information, along with information on state and local tax rates and rules on how incentives are applied based on firm characteristics, the database is able to separately calculate state tax and incentive rates for each year of operation. The present value of the stream of taxes and incentives is then calculated using a discount rate. The data are then reported as a percentage of the value added for the new firm. It is also important to note that we are using the average state incentive and tax as a percentage of the value added at each time period. It would be ideal to exploit variation in taxes and incentives given to firms within various manufacturing sectors in the same state; however, given the nature of the model and available data, I am unable to take advantage of such variation.

There are several limitations of the Bartik dataset. The first is that incentives do not just occur at the state level. Previous literature has shown that localities also offer incentives and may even work with state officials to create a compensation package for a

particular industry or firm (Calcagno and Hefner, 2018). While this may be the case, the Bartik dataset creates the state incentive numbers based on incentives offered in major metropolitan areas within the state. Most incentives typically go to companies that locate in the major metropolitan areas, which also represent the main “economic centers” of each state. Taxes may also differ across counties; however, any differences in taxes would pressure counties to offer similar net taxes after abatements (Bartik, 2017). Second, there are several important types of incentives that are excluded from the database. These include “deal-closing" funds and other discretionary incentives that are used by government officials and economic development agencies to tip the firm location decision in their favor. While this would be interesting to include in the model, these types of offers are generally reserved for few large investments and the amounts offered can differ substantially among firms. Additionally, if such incentives were included, selection bias would affect the model estimates as any type of data coming from these types of incentives would only reflect accepted offers. Finally, any tax simulation should account for apportionment of corporate income. Generally, states do not only tax firms on profits made in the state; rather they also tax firms on profits a firm has made within the country. Any national profits made are typically apportioned to the state based on the share of property, payroll, and sales that occurred in that state (Bartik, 2017). Traditionally, each of these characteristics each received equal weight in the calculation. More recently, states have adjusted the formula in order to lower taxes for firms that have a large share of out of state sales, as these firms make up a significant portion of the state's export base. The Bartik database handles this by separating export-based firms from non-export base firms. For export-oriented firms, the effective corporate income tax

is the nominal corporate income tax rate which is then adjusted by the sales factor ranging from 1/3 to 1, depending on state rules. While this does not account for the full complexity of the U.S corporate tax code, it does reflect some of the more important rules that are imposed on corporations. As a result, the database should provide a good representation of the “standard deal", or the overall incentives and taxes offered to a new firm, in the manufacturing industry in a particular state and year.

Additional data on state characteristics are pooled from the U.S. Bureau of Economic Analysis and the U.S. Bureau of Labor Statistics. County characteristics are drawn from the U.S Bureau of Census reports, the Bureau of Transportation Statistics, the U.S. Bureau of Labor Statistics, and the U.S Department of Agriculture. The state and county-level location determinants have been selected based on a review of the previous empirical literature and regional economic theory. Tables 1.1 and 1.2 summarize each variable used, their definitions, and their anticipated signs.

Section 1.5: State Hypotheses

Table 1.1 displays all state characteristics that I use in my analysis. At the state level, the literature reveals that the main fundamental determinant of manufacturing location is agglomeration. Fundamentally, manufacturing firms are attracted by existing networks of agglomeration. In particular, it has been found that the spatial clustering of firms allows for productivity gains through knowledge transfer and supplier specialization. Additionally, it has been recognized that industrial clusters may also create large centralized labor pools that allow for better matching of workers to

employers (Howard et al., 2012). Most studies have found positive effects of manufacturing agglomeration on firm location decisions.

Previous regional FDI research considers two different types of agglomeration: total domestic agglomeration and foreign agglomeration. In this study I test both foreign and domestic agglomeration factors. I assume foreign agglomeration occurs at the state level. Previous studies capture foreign agglomeration through the presence of existing manufacturing employment by foreign-owned firms in a given area (Head et al., 1999), previous FDI establishments (List 2001), or share of foreign-owned firms Guimaraes et al., (2004). Most of these studies find a positive effect of foreign agglomeration on the location decision of firms. As in Head et al. (1999), I measure foreign agglomeration by the prior year's stock of manufacturing employment by foreign owned firms. A location that has been frequently selected by many other foreign firms should be attractive for a new foreign firm as well. This is the result of certain local characteristics that foreign firms would find attractive. A new firm could take advantage of information and networks that other foreign firms have already established. Cultural aspects could also dictate this relationship. For example, Head et al., (1999) finds that Japanese firms prefer locations that already have clusters of Japanese firms. I expect that a higher presence of foreign manufacturing employment concentration will increase the probability of investment by a new foreign firm.

Section 1.5.1: Unionization and the Business Climate

One characteristic of the labor market in the United States that may also affect foreign investors' location, is the presence of unions. Previous literature has found mixed

results for the effect of unionization rates on manufacturing plant location. In an early study of U.S. manufacturing, unionization increased the probability of location (Bartik 1985). For studies of FDI, however, Friedman et al., (1992) detects no effect for labor market characteristics. Zhuang (2016) finds insignificant effects of unionization. Nevertheless, most studies (Coughlin et al., (1991), Woodward (1992), Head et al., (1999), O'Huallachain and Reid (1997)) uncover that foreign-based manufacturing firms appear to prefer areas that are less unionized.

As in previous studies, I measure unions as the percentage of the state employed population that is represented by unions. Unions represent an increased cost to incoming firms and may impede managerial control and operational flexibility. In the United States, companies increasingly avoid highly unionized areas, with manufacturing firms like Boeing even relocating to take advantage of lower costs in non-unionized areas like South Carolina (Olgin, 2017). Union participation should negatively affect the probability of investment.

Both taxes and incentives in this database are reported as percentages of the value-added for the manufacturing industry. Value-added refers to the value of manufactured products above and beyond the value of the materials that went into the production process. This measure is used for various reasons. First, value added is an easier measure to compare across industries than something like profit which usually reflects some kind of tax planning. Second, the literature on business location commonly measures the impact of various costs in terms of the value added. For these reasons, it is only natural to express taxes and incentives, which represent increased/decreased costs to an incoming firm, as a percentage of the value-added (Bartik, 2017). The incentives listed

in Table 1.1 range from .06 percent of the value-added to 0.62 percent of the value-added. The property tax abatement is the largest incentive offered in the sample while the research and development credit is the smallest incentive offered. The taxes range from 0.9 percent to 2.66 percent of the value-added. The sales tax represents the smallest tax burden while the property tax represents the highest tax burden for firms in our model. All else equal, higher incentives should increase the probability of investment while higher taxes paid should decrease the probability of investment.

Section 1.6: County Hypotheses

Table 1.2 shows the county characteristics that I consider in the analysis. At the U.S. county level, the traditional locational determinants are agglomeration, workforce characteristics, infrastructure, and other local area specific characteristics.

Section 1.6.1: Agglomeration

As previously discussed, agglomeration is an important factor in the location decision process. It is widely accepted that regions with high industry agglomeration will benefit from positive externalities of being in close proximity to other firms and workers. Both localization and urbanization economies are measured at the county level.

Section 1.6.1.2: Establishments and Localization Economies

Localization economies are the positive spillovers that a local manufacturing firm can benefit from by locating within a cluster of local establishments in the same industry. Previous studies capture this effect of total domestic agglomeration through the number of existing manufacturing plants in a county (Woodward 1992, Head et al., 1999), manufacturing employment (Strauss-Kahn and Vives, 2009) or production worker hours

by industry (McConnell and Schwab, 1990). Most of these studies have found positive and significant effects of domestic agglomeration on the location decision. In my analysis, local agglomeration will be captured by the total number of manufacturing establishments in a given county each year. As previously mentioned, there are many reasons why agglomeration should matter. Clusters of manufacturing firms may have already developed important infrastructure networks, supplier relationships, and a strong pool of highly skilled labor. For these reasons, it is expected that the county-level concentration of manufacturing establishments will be a positive and significant factor in the location decision.

Section 1.6.1.3: Urbanization Economies

Urbanization economies are the more general benefits that a manufacturing firm can benefit from that are generated through the interaction of various industries and clusters within a given region. It has been noted by previous studies that firms also receive benefits from urban agglomeration, or the activities of a diverse set of firms and services that occur in an area that may not necessarily be related to an industry (Arauzo-Carod et al., 2010).

This effect will be captured through an indicator for the urbanization of a given county. This measure comes from the U.S Department of Agriculture Typology Codes for Counties. A county is considered urban if it has a population of at least 50,000 or if it is economically tied to a neighboring urban county. This is expected to be a positive factor in the location decision. Urbanized areas are expected to have better infrastructure and more specialized business services that a new firm could take advantage of.

Section 1.6.1.4: Urban Wage Premium

Another way that urbanization economies can be captured is through the urban wage premium. In the model, I enter the average weekly manufacturing wage in each county in each year. The county-level average wage is a measure of agglomeration which should reflect the higher productivity or skill of the workforce in a given area. This measure represents a labor force characteristic of the region. It is important to note that this is not the wage that is actually paid by the firm. The wage that is actually paid is negotiated and varies by investor. When foreign investors enter a new market, they start at a disadvantage relative to actual domestic competitors. In particular, they are unfamiliar with local laws and the business culture. In order to compete and succeed, it is logical that they must have a competitive advantage over domestic firms (Hymer, 1960). This could come from superior technology, branding, or better management. Without these advantages, FDI would not succeed in developed economies. For these reasons, it makes sense that foreign firm would not simply search for areas with low wages, rather they would look for areas that offer high productivity and worker quality. As it has been well documented that firms locate in areas with high concentrations of like firms, I expect higher local wages to increase the probability of investment.

Section 1.6.2: Other Area Specific Characteristics

Beyond the locational influences of incentives and agglomeration, firms choose among regions (states or counties) that have other potential influences on manufacturing production. Due to inconsistent and varying models, data, time periods, locations, and industries, there is no consensus on the most important local determinants of firm location decisions. However, other factors have also been found to have an effect. At the

local (or county level), firms seem to prefer areas that are better connected through transportation networks and offer better accessibility for product distribution. This is confirmed by Coughlin et al., (1991) and Zhuang (2014). Zhuang (2014) finds that highway access seems to be the most important element of infrastructure, while airport and railroad connectivity did not have significant impacts for greenfield investment. Woodward (1992) finds that at the county level, highway access is most important for plants that are located in more rural areas. Infrastructure and access to markets have often been found to be positive factors for the firm, yet this may depend on the nature of the investment. I expect this result to also hold in this study, however, the importance of these factors may depend on the end goal of the investing firm. If the firm has national or international markets, or extensive national or international supply chains, then a longer distance to airports and ports should negatively impact the investment decision. To account for infrastructure characteristics, I calculate the centroid of each county in my data set. I then calculate the geodesic distance, in miles, from each county centroid to the nearest airport and port. Ideally, this measure would account for the distance from the actual investment to the nearest airport/port, however, my FDI data is not geocoded. While this is a limitation of the data, it should serve as a rough approximation for local area infrastructure characteristics. I expect a greater distance between a given county centroid and the nearest airport/port to decrease the probability of a foreign firm locating in that county. If the aim of the firm is to access local consumers or does not depend on distance to suppliers, then transport infrastructure may not matter.

In previous research, land area is considered a proxy for the number of available locations within a state. Similarly, the county land area will be used as a proxy for the

number of available locations within a county. Increased availability of investment options should increase the probability of investment, and as previous results have found, it is assumed to be positive in this study as well.

Finally, I will consider an indicator for counties that are in persistent poverty. The data also come from the U.S Department of Agriculture Typology Codes for Counties. Counties are classified as being in persistent poverty if at least 20 percent of their population was considered poor in the 1980, 1990, and 2000 census, as well as in the ACS 5-year estimates from 2007-2011. I choose to control for counties that are in persistent poverty because such areas may lack public services and infrastructure as well as have poor labor market conditions. I expect this variable to negatively impact the location decision.

Section 1.7: Estimates of the Determinants of FDI

The main results for five specifications of the model are presented in Table 1.3. The first column presents the results for the fundamental determinants of foreign investment. The second column considers the effect of net taxes, or the effect of taxes after incentives have been taken into account. The third column considers the aggregate tax and incentive variables of interest, while the fourth column breaks out the tax and incentive variables in order to determine which taxes or incentives may matter in the location decisions of firms. Ideally in this model, I would like to measure the effect of both property tax abatements and property taxes on the probability of investment. However, property tax abatements are used to offset the local property tax and traditionally abatements are higher in states with higher property taxes. For this reason,

these measures are highly correlated with each other. As such, I choose to measure the effect of the net property tax on the probability of investment.

Generally, the traditional determinants all have the expected signs, and most are statistically significant at the ten percent level or higher. These estimated results are robust to the inclusion of the tax and incentive variables. It can be shown for the Poisson model that $E(Y|X) = e^{\beta lnX} = \hat{\beta}$. As all variables enter the estimation equation logarithmically, the reported coefficients can be interpreted as elasticities, representing the percentage change in the expected number of FDI projects given a one percent increase in the given variables (Cameron and Trivedi, 2013). When considering the effect of net taxes, the results reveal that a one percent increase in the net tax paid as a percentage of total firm costs decreases the count of expected FDI projects by approximately 0.46 percent. When considering the overall effect of taxes and incentives in column 3, both variables have the correct sign and are statistically significant at the five percent significance level. Importantly, these results reveal that a one percent increase in total taxes as a percentage of total business costs decreases the expected number of FDI projects by 0.71 percent while a one percent increase in total incentives as a percentage of total business costs increases expected investment by 0.34 percent.

In order to understand which incentives are driving these results, I consider the model in column 4. The following analysis comes from the results in column 4. As expected, most of the variables that represent increased costs are negative but only a few are statistically significant at the 10 percent significance level or higher. Higher union participation decreases investment, but this is not statistically significant. This insignificant result could be due to the inclusion of state controls in the analysis. The

negative result, however, is as expected; when firms locate in such areas, they may have to deal with higher wages and regulations when hiring employees which increases the overall cost of doing business. These results also confirm that transportation costs are a significant factor in the location decision. Increased distance to airports and ports negatively affect the location decision. For a one percent increase in distance to an airport, expected investment decreases by 0.14 percent. This indicates that firms are more likely to choose areas that are well connected, and which allow them to more easily transport goods to new markets. Note that distance to ports is not statistically significant. This could indicate that these firms are not necessarily exporting their goods overseas. It is more likely that the markets they aim to reach when they locate in the United States are located within the country.

As expected, county land area was positive and statistically significant. A one percent increase in county land area increases the probability of investment by 0.19 percent. Larger land area signals more investment opportunity. Firms are drawn to counties that have more space available on which to build their facilities. Larger counties could also benefit firms that have long investment horizons and may wish to expand operations in the future.

The variables that represent both foreign and domestic agglomeration were positive and statistically significant factors in the FDI location decision. Localization economies, as measured by the total manufacturing agglomeration at the county level, has a larger impact on investment than foreign agglomeration at the state level. Investment increases by an approximate 0.92 percent for a one percent increase in the number of domestic establishments in a given county. Areas with higher FDI employment do not

appear to significantly attract more investment. This indicates that foreign firms value areas that have high industry concentration. Areas with a higher number of existing manufacturing firms are more favorable because they have existing supplier networks and specialized pools of labor. Additionally, high industry agglomeration allows for learning and other beneficial spillover effects.

Moreover, the results suggest that companies value the skill of the local labor force. From these results, it appears that firms do not look for low skilled labor that they can pay less. Rather they search for a more specialized labor pool that they can pay according to their productivity. Urban wages, which represent productivity, are a positive and significant factor in the location decision. A one percent increase in the average weekly manufacturing wage increases expected investment by approximately 1.31 percent. This also points to another key feature of foreign investment. In order to overcome their foreign disadvantage, foreign investors choose to locate in areas with higher worker skill and productivity and as a result they choose to pay their workers accordingly.

From a policy perspective, the most interesting and compelling results come from the variables representing taxes and incentives. Taxes and incentives seem to have a considerable effect on investment decisions. These variables generally have the predicted signs; however, the findings suggest that certain taxes and incentives matter more than others. The corporate income tax was the only tax that was a statistically significant factor in the FDI location decision. A one percent increase in the corporate income tax as a percentage of local firm costs decreases the expected number of FDI projects by 0.46 percent. In terms of incentives, the investment tax credit is the only incentive that is

positive and statistically significant. The results indicate that a one percent increase in the investment tax credit as a percentage of local firm costs, increases the expected number of FDI projects by 1.56 percent.

These results suggest that taxes and incentives do matter for the location decision of firms. This complements some of the previous findings in the urban and regional economics literature (Bartik, 1991, Peters and Fisher, 2004, Arauzo-Carod et al., 2010, Bartik, 2018, Walckzak, 2018). This is a relevant finding that could help inform today's debate over taxes and their effect on investment in the United States. The recent Tax Cuts and Jobs Act, aimed at promoting economic growth, reduced the corporate income tax from 35 percent to 21 percent. The purpose of this legislation was to make the United States more competitive relative to other nations. On top of the national tax, states also levy corporate income taxes. Out of the 44 states that do levy a corporate income tax, the average state corporate income tax is 6 percent. The corporate income tax ranges from 3 percent in North Carolina to 12 percent in Iowa. In my sample, the states with the highest tax rates are Minnesota (9.8 percent) and Illinois (9 percent) (Walckzak, 2018). States wanting to attract manufacturing FDI may be able to make themselves even more competitive through lower corporate income taxes.

The only incentive that was statistically significant in the foreign location decision was the investment tax credit. The property tax abatement had no measurable impact on the investment decision. This is surprising as the property tax abatement has long been one of the most significant subsidies for capital intensive firms like manufacturers. These results could have occurred for two reasons. First, the Bartik database does not account for the full complexity of the property tax abatement. The

database does not model Tax Increment Financing (TIF) programs which typically allow special property tax exemptions for firms. Second, the simulation only runs for one year as we are only interested in the full value of the incentive package at the time the investment is made. This could plausibly result in some downward bias in the results. Generally, property tax abatements are granted on a case by case basis to particular firms. This incentive can also be structured in many ways which is not fully captured by the database. It is not unusual for such a subsidy to last up to 30 years. Firms may receive a specific tax reduction for a specified amount of time. Localities could also allow for the property tax itself to be phased in over a certain number of years, until the full property tax rate is reached. Alternatively, the property tax may be frozen at the time the deal is signed, which could benefit firms that may wish to expand in the future. Sometimes, firms may even make payments in lieu of taxes, which usually consist of a yearly payment to the school system at a lower rate than the tax itself (Good Jobs First, 2018).

The property tax abatement is controversial, so its effect is important to understand. Local governments often support the subsidy because they argue that otherwise, they may not have had any investment in the community. There is also some debate as to whether the companies that receive the abatement actually value them. These subsidies can be detrimental to school districts as well as fire and police departments which generally receive a majority of their funding through state property taxes (Good Jobs First, 2018). Property tax abatements tend to be highest in states with higher property tax rates. South Carolina, Michigan, and Tennessee have high property taxes relative to the national average and consequently also have higher property tax abatements. While this incentive does not appear to lure manufacturing investments to a

given area, further research should examine the extent to which the community may be affected by the property tax abatement.

While the property tax abatement was the most important incentive in the 1990's, the investment tax credit has recently experienced the largest increase in use over time (Bartik, 2017). Investment tax credits are typically offered to firms that invest in new property, plants, equipment, or machinery in the state. This investment must be deemed a "qualified" investment by the state to be awarded. Typically, this credit is offered to firms that invest in new property only as opposed to those that renovate existing properties (Walckzak, 2018). Investment tax credits are particularly large in southeastern states like Alabama, Kentucky, and South Carolina. This incentive had the highest impact on the probability of investment relative to all other incentives considered in this study. A one percent increase in the investment tax credit as a percentage of local firm costs increased the number of expected FDI projects by 1.56. This could be because this incentive is only given once at the start of the project whereas other incentives like the property tax abatement may be phased in over a longer period. It could also be the case that capital-intensive firms like manufacturers, make need this type of incentive to offset their very high startup costs. This is important to understand in the context of the Foxconn debate. They were offered over 1.3 billion dollars in investment tax credits. Interestingly, in the case of Foxconn, they were offered over 150 million dollars in sales tax exemption, which in my analysis had no measurable effect on the investment decision.

Section 1.8: Simulation of Changes in Incentive and Tax Rates

Given that taxes and incentives do seem to matter in the investment decision, I consider the effect of changes to the current incentive/tax levels. These findings are presented in Table 1.4. In this experiment, I start with a base prediction which shows the expected number of FDI projects in a county in a particular year holding all of the variables constant at their means and assuming the random effect is zero. The expected number of FDI projects from this base prediction is 0.05. Next I assume the investment tax credit is zero and perform the same exercise to find that the expected number of FDI projects is 0.03. This prediction is statistically significant and represents a 40 percent decrease in the predicted number of FDI projects. When performing the same exercise with the corporate income tax rate, I find that moving from the mean corporate tax rate of 1.18 percent to zero corporate income taxes, the number of FDI projects increases by 35 percent. This is a considerable increase, however, not as large as the decrease in investment from a reduction in the investment tax credit. In the last column, I assume all incentives are zero while holding all other variables constant at their means and find that the expected number of FDI projects is 0.04, representing an approximate 36 percent decrease in the number of FDI projects. In the following rows of the table, I take the 25th, 50th, and 75th percentile values of the incentive/tax variables considered and use those values to predict the expected number of FDI projects while holding all other variables at their means. These results indicate that the biggest increase to the number of expected FDI projects would come from significantly increasing the investment tax credit. An increase of the investment tax credit from its 50th percentile value of 0.08 percent of business costs to its 75th percentile value of 0.74 percent of business costs increases the

predicted number of FDI projects by approximately 129 percent. A similar increase in the corporate income tax only decreases the predicted number of FDI projects by 4 percent. When examining the effect of moving from the 50th percentile values for all incentives to their 75th percentile values, I demonstrate a very large increase in the predicted number of FDI projects. An increase from the 50th to the 75th percentile of all incentives increases the predicted number of FDI projects by approximately 128 percent.

Section 1.9: Conclusion

Incentives are often justified because they induce investment by new firms thus bringing new jobs to a locality. In theory, this should increase demand for local goods and services and should increase economic growth (Peters and Fisher, 2004). While it has long been recognized that incentives can impact the location decisions of foreign investors, it has been difficult to assess this impact due to a lack of data. In this paper I bring together two important databases, fDi Markets and the Bartik database, to address this gap in the literature. To my knowledge this paper is the first to test the importance of the most common taxes and incentives that foreign manufacturers face, in the location decision. My analysis reveals that the tax and incentive climate in a particular state do impact the location decisions of manufacturing FDI. Through a panel Poisson regression with random effects, I find that the corporate income tax has an elasticity of 0.46 while other taxes have no measurable impact on the location decision. Additionally, the investment tax credit has the most significant pull in the business location decision with an elasticity of 1.56. This finding is robust across all specifications considered. It could be the case that capital-intensive manufacturing firms highly value these types of incentives in order to offset their often very large start-up costs.

The results also confirm that agglomeration economies still matter. Investors tend to locate in areas where manufacturing agglomeration is highest so that they may take advantage of existing networks and other beneficial spillovers from nearby firms. These findings are robust across almost all specifications considered. I find that a one percent increase in domestic manufacturing agglomeration in a given county increases investment by approximately 0.92 percent. Urban agglomeration economies, as captured by the urban wage premium, can be even more important than localization economies in the location decision. I find that a one percent increase in the average weekly manufacturing wage increases investment by approximately 1.31 percent.

The analysis provided in this paper only pertains to the U.S market, however, these findings can also be generalized to other areas. Incentives are also used internationally to target FDI. While foreign countries offer far less incentives at the local level than do the United States, there is one important factor that ties these findings to other areas. This study finds that agglomeration economies are among the most significant factors in the location decision. This type of finding is consistent with findings in previous literature analyzing markets around the world (Guimareas et al., 2000). Future research should examine the extent to which these results hold across various industries and markets.

Table 1.1: State Characteristics

State Variables	Definition	Mean (Std. Error)	Anticipated Sign	Source and Year
Prior FDI Stock	Prior year stock of manufacturing employment of Majority Owned US Affiliates (thousands of employees)	68.824 (30.017)	+	BEA 2005-2015
Job Creation Tax Credit	Incentive received as a percentage of the value-added	0.564 (0.495)	+	Bartik Database 2005-2015
Investment Tax Credit	Incentive received as a percentage of the value-added	0.416 (0.654)	+	Bartik Database 2005-2015
R&D Credit	Incentive received as a percentage of the value-added	0.064 (0.096)	+	Bartik Database 2005-2015
Property Tax Abatement	Incentive received as a percentage of the value-added	0.617 (0.902)	+	Bartik Database 2005-2015
Customized Job Training Subsidy	Incentive received as a percentage of the value-added	0.106 (0.155)	+	Bartik Database 2005-2015
Property Tax	Tax paid as a percentage of the value-added	2.663 (1.258)	-	Bartik Database 2005-2015
Sales Tax	Tax paid on business inputs as a percentage of the value-added	0.925 (0.607)	-	Bartik Database 2005-2015
Corporate Income Tax	Tax paid as a percentage of the value-added	1.190 (0.313)	-	Bartik Database 2005-2015
Union	Percent of employed that are members of a union	9.234 (4.815)	-	Bartik Database 2005-2015

Table 1.2: County Characteristics

County Variables	**Definition**	**Mean (Std. Error)**	**Anticipated Sign**	**Source and Year**
Distance to Airport	Distance from center of county to nearest airport, measured in miles	18.784 (11.265)	-	Bureau of Transportation Statistics 2005-2015
Distance to Port	Distance from center of county to nearest port, measured in miles	371.935 (268.768)	-	U.S. DOT 2005-2015
Establishments	Number of manufacturing establishments by NAICS code	101.5 (278.8)	+	County Business Patterns 2005-2015
Wage	Average weekly wage to manufacturing workers, in dollars	815.4 (252.9)	+/-	BLS 2005-2015
Land Area	Total land area, Measured in square miles	534.0 (332.2)	+	U.S. Census 2000/2010
Metro	=1 if county is urban =0 otherwise	0.433 (0.496)	+	U.S. Department of Agriculture 2005-2015
Persistent Poverty	=1 if at least 20% of the population was considered to be poor =0 otherwise	0.126 (0.332)	-	U.S. Department of Agriculture 2005-2015

Table 1.3: Estimates of the Determinants of FDI

Invest	(1)	(2)	(3)	(4)
Union	-0.0412	0.098	0.094	-0.025
	(0.125)	(0.143)	(0.144)	(0.151)
Distance to Airport	-0.150**	-0.146**	-0.147**	-0.144**
	(0.049)	(0.047)	(0.047)	(0.047)
Distance to Port	0.036	0.023	0.023	0.027
	(0.064)	(0.064)	(0.064)	(0.064)
Prior FDI Stock	0.519+	0.527+	0.536+	0.279
	(0.289)	(0.273)	(0.277)	(0.291)
Establishments	0.947***	0.922***	0.923***	0.922***
	(0.043)	(0.042)	(0.042)	(0.042)
Wages	1.180***	1.316***	1.314***	1.311***
	(0.263)	(0.235)	(0.235)	(0.237)
Land Area	0.186*	0.188*	0.188*	0.188*
	(0.092)	(0.091)	(0.091)	(0.091)
Metro	0.046	0.053	0.053	0.054
	(0.100)	(0.101)	(0.101)	(0.101)
Persistent Poverty	-0.396*	-0.375*	-0.376*	-0.376*
	(0.162)	(0.162)	(0.162)	(0.162)
Net Taxes		-0.461*		
		(0.179)		
Taxes			-0.705*	
			(0.281)	
Incentives			0.342**	
			(0.131)	
Net Property Tax				-0.237
				(0.161)
Corporate Income Tax				-0.461*
				(0.230)
Sales Tax				-0.254
				(0.217)
Job Creation Tax Credit				-0.092
				(0.284)
Investment Tax Credit				1.562***
				(0.432)
R & D Credit				-1.046
				(0.923)
Customized Job Training Subsidy				-0.335
				(0.291)
N	18259	16862	16862	16862
BIC	12943.22	11844.22	11852.32	11881.55
LL	-6285.17	-5737.19	-5736.37	-5726.65

Note: Results presented are from estimation of a panel/poisson model with random effects.
Dependent variable *Invest* represents the count of new investments in county *i* in state *k* in year *t*.
All models include both state and year controls. Standard errors in parentheses, clustered at the county level.
$^{+}\ p < 0.10$, $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Table 1.4: Simulation of the Predicted Number of Investments

	Base Prediction	Investment Tax Credit	Corporate Income Tax	All Incentives
	0.0511***	0.0336***	0.0727***	0.0384***
25th %	-	-	0.0525***	0.0373***
50th %	-	0.0381***	0.0507***	0.0405***
75th %	-	0.0797***	0.0490***	0.0772***

Note: This table shows the predicted number of events holding all variables constant at their mean values and assuming the random effect is zero. Apart from the base prediction, the first row shows the predicted number of events if the incentive/tax is zero and all other variables are held at their means. In the following rows, I repeat this excerise but vary the incentive/tax to their amounts at the 25th, 50th and 75th percentiles respectively. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

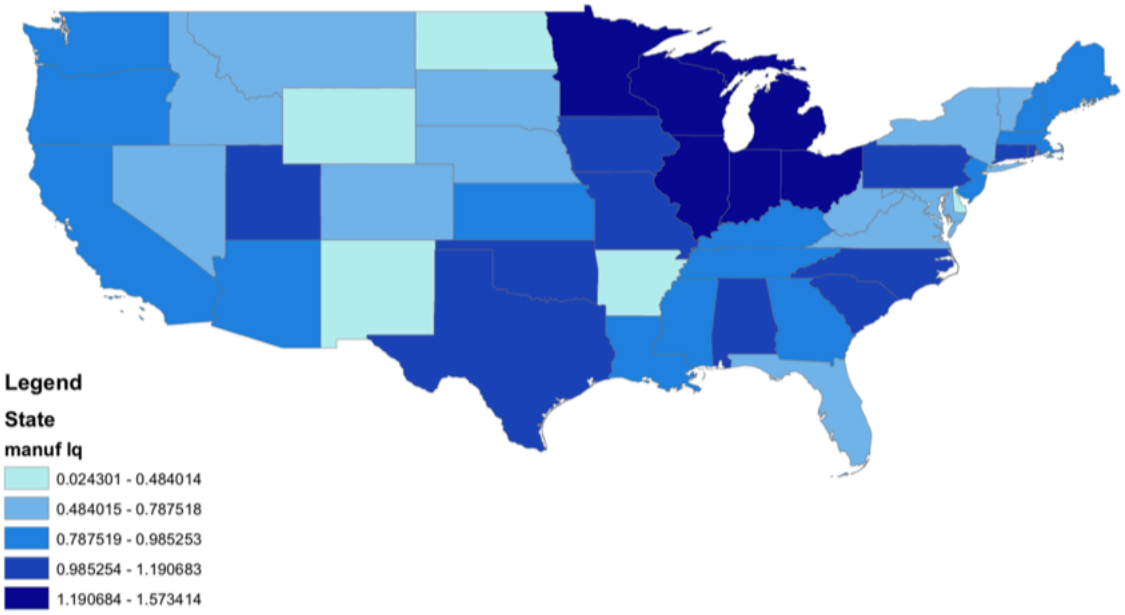

Figure 1.1: Manufacturing Intensity in the United States, 2003-2017

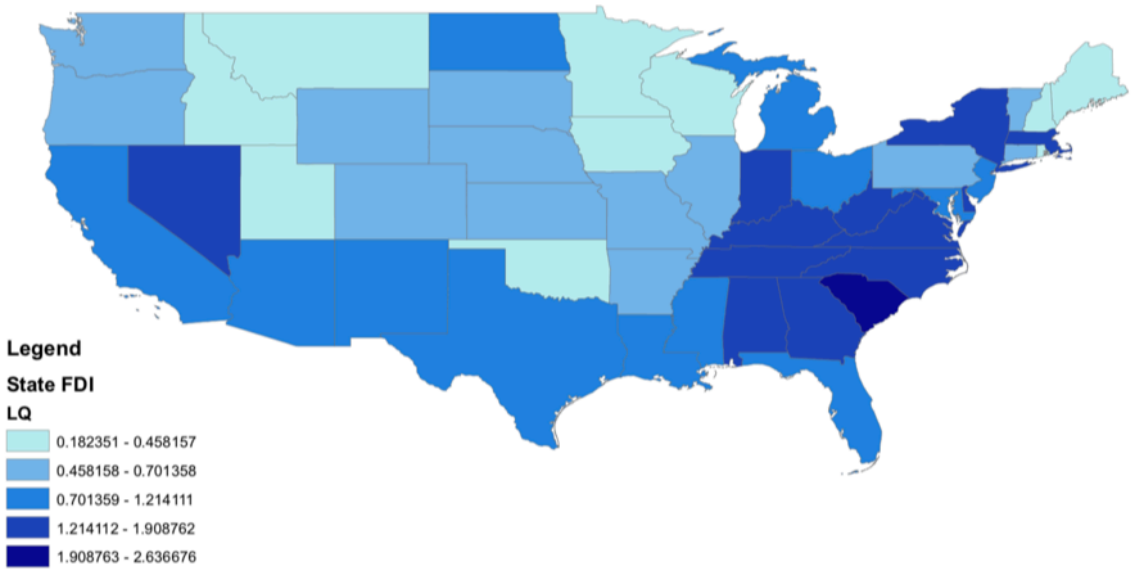

Figure 1.2: Foreign Manufacturing Intensity in the United States, 2003-2017

CHAPTER 2

THE EMPIRE STRIKES BACK: THE EFFECT OF HISTORICAL AND CULTURAL AFFILIATIONS ON THE ALLOCATION OF FDI IN EASTERN EUROPE

Section 2.1: Introduction

Culture is an integral aspect of international business and economic decisions. When foreign firms decide to invest in a new country, they typically do so at a disadvantage relative to domestic firms. They must not only successfully establish operations in a new country, but they must do so while navigating a new culture, as well as relatively unfamiliar legal systems, organizational and managerial practices, and communication and negotiation styles. In this sense, their "foreignness" becomes a liability the greater the cultural distance between home and host country (Beugelsdijk and Maseland, 2011). This fundamental hypothesis is extensively studied in the academic literature (Zaheer, 1995). Yet, the causal impact of culture on the location of FDI has been difficult to determine. This results from the fact that culture is difficult to define and is often entangled in other societal aspects such as historical ties, institutions, the political economy, religion, ethnicity, language, and nationality which can also affect the allocation of FDI.

To understand the potential effect of culture and historical ties on the allocation FDI, I implement a spatial regression discontinuity design to test for discontinuous

changes in investment at the historical border of the Habsburg Empire. The former empire had a border which ran through several present-day countries including Romania, Serbia, Poland, and the Ukraine. In this study, I choose to focus on two countries specifically: Romania and Serbia[1]. Cities located on either side of this historical border have shared common institutions for the last 100 years. Any difference in the distribution of FDI on either side of this border should be attributed to the Habsburg cultural effect and the potential historical ties that were developed as a consequence of the previous empire affiliation. Several papers show that historical empire affiliations may affect the level of economic development today. Grosjean (2013) explores the effect of Ottoman rule on financial development today. She shows that Islamic rule is associated with lower levels of bank penetration across and within countries. When examining the effect of the empire within countries she notes that while the financial system is less developed in these areas, no other factors such as income or business development are affected. Peisakhin (2012) demonstrates that the Habsburg and Russian empires influenced the political identities and social norms of individuals living on either side of this no longer existing border in the Ukraine. In particular, differences in social attitudes towards Russia persist today. Grosfeld and Zhuravskaya (2013) examine the historical division of Poland between three empires: the Russian, Habsburg, and Prussian empires. The authors find no

[1] It would be interesting to also include Ukraine and Poland in the analysis. These countries were dropped from the sample for several reasons. I chose not to include Ukraine as there was limited data available at the regional level. This would not allow me to check the robustness of the findings as I do for Serbia and Romania. I chose not to include Poland as the basic assumptions of the model did not hold in this case. There was no evidence of a discontinuity in the number of Habsburg projects for Habsburg investors at the Habsburg border. In fact, there was very little FDI in the former empire territory overall. This could be due to the fact that the former empire territory in Poland was a very small part of the country as a whole. Additionally, this region seemed to have a different history and experience with the empire than did the regions of Romania and Serbia.

differences in income, industry, corruption or trust today, however, they do observe a persistence of culture as exhibited through religious practices and beliefs in democracy. Becker et al. (2014) show that Habsburg empire affiliation affects the levels of trust that individuals have in their court systems and police force today. These papers suggest that prior empire affiliations may affect the path of economic development. Papers that specifically examine the impact of the Habsburg empire, present evidence of a long-lasting cultural impact in former empire territories.

Building on these findings, I propose that the Habsburg Empire strongly influenced the culture of the territories it controlled, and that impact can be found in contemporary investment decisions. Therefore, it is likely that territories formerly belonging to the Habsburg empire would be more likely to attract FDI from countries also sharing a historical tie to the empire today.

The main analysis reveals that the number of FDI projects from Habsburg affiliated countries is higher in the former empire portion of present-day Romania and Serbia today. Specifically, there are approximately 0.24 to 0.32 more "empire" projects per 10,000 individuals in former empire territories. There is no evidence of such a jump in investment projects from the rest of the world at this same border. Additionally, I find no evidence of a jump in any other characteristics that may impact this allocation of FDI at the former empire border.

Many of the previous studies examining the effect of culture on FDI are conducted at the country level and examine only one aspect of culture such as language or religion. However, culture is much larger than just one element of a population. Common language and religion are rough proxies for the elements that unite a people.

While institutions also matter, most formal institutions are typically at the national level, making it difficult to determine whether the effect captured is due to institutions or culture. Other papers in the cultural economics and business literature use the Hofstede index to calculate a cultural distance between countries. While this index made great strides in allowing comparisons of cultural distance between countries, it also has many shortcomings. First, culture may not be homogeneous within a country which may also affect the distribution of FDI. Additionally, the distance between two countries may not be symmetric. Finally, it is also a concern that all components of the Hofstede index are typically given equal weight in distance calculations; it is very possible that some dimensions may matter more in some business contexts than others (Beugelsdijk and Maseland, 2011). By defining culture as belonging to a historical empire and examining variations in investment patterns within countries, I am able to separate the effect of culture from nationality, language, and formal institutions. This allows me to capture the effect of cultural differences and historical ties on the allocation of FDI today.

In the next section I place my research in the context of the current literature. Section 2.3 examines the historical background of the Habsburg empire in order to better understand the mechanisms through which the empire affiliation may have impacted the cultural and spatial allocation of FDI today. Sections 2.4 and 2.5 introduce the data and methodology and Section 2.6 presents the main results of the analysis. Section 2.7 presents various robustness checks, while section 2.8 concludes.

Section 2.2: Literature Review

Section 2.2.1 The Impact of History on Economic Development

It is now accepted that historic events can impact economic development today. The importance of history for economic development is documented in a review of the literature by Nunn (2009). In previous studies the impact of history is mainly examined under the context of Europe's colonization and expansion. The channel through which history impacts development is through the effect that it can have on institutions (Nunn, 2009). There are three main strands of literature which explore this proposition. The first strand of literature relates the importance of factor endowments and colonial rule to economic development. Engerman and Sokoloff (1994) examine differences in land endowments suitable for the cultivation of traded crops, like sugar, which were best produced on large scale plantations using slave labor. The study reveals that areas relying on slave labor promoted laws that protected the elites which resulted in political and economic inequality. While this first paper was primarily qualitative, subsequent extensions of this hypothesis also find negative relationships between the past use of slavery and economic development measures across states and counties, and new world countries today (Mitchener and McLean, 2003, Lagerlof, 2005, Nunn, 2009).

The second strand of literature examines the role of legal institutions transplanted during colonial rule and their effects on investor protection and financial development. For example, La Porta et al. (1997) find that British common law offers the greatest investor protection today.

The final strand of literature examines the historical origins of current institutions and their importance for long term economic development. The seminal Acemoglu et al. (1997) paper examines the disease environment in former colonies. The authors in this paper hypothesize that Europeans were more likely to settle in areas with less disease. As a result, Europeans were only able to set up growth promoting institutions, which protected property rights, in areas where they settled. In contrast, Europeans did not often settle in areas with harsher disease environments, and instead chose to set up extractive institutions in these colonies. The authors use an instrumental variable approach using early European settler mortality rates as the instrument for institutions to show that areas with lower mortality rates have higher per capita incomes today. These papers made great strides in determining that history impacts economic development. However, these papers do not explore why regions within countries may experience varying levels of economic development today. This paper differs importantly from this body of literature by building upon the fact that history matters by examining the effect of history on regional development today.

Several papers make important contributions in the analysis of how history matters at the regional level. Dell (2010) examines the effect of the mita, a forced mining labor system established in Peru and Bolivia between 1573 and 1812. This paper uses a regression discontinuity design to compare outcomes in mita and non mita districts today. By comparing outcomes very close to the border, she shows that the mita had negative effects on long term economic development. Specifically, the author finds that consumption is 32 percent lower in the mita side which is driven by lower levels of education and less developed road networks. This is attributed to the fact that mita

governments restricted large land holdings and it was the landowners that typically lobbied for a greater provision of public goods. In this case, history impacted the concentration of wealth and power which impacted the development path of these regions.

Ambrus et al. (2020) examine how disease can permanently alter the growth path of urban areas. In this paper the authors investigate the impact of the cholera epidemic in one London neighborhood. The cholera outbreak in this neighborhood was devastating. In one month, 5 percent of families lost their main wage earners and became impoverished. The authors demonstrate that this incident had an effect on neighborhood poverty, as captured by real estate prices, immediately after the outbreak. These differences in real estate prices persist even 160 years after the end of the epidemic suggesting that such localized health shocks can affect the trajectories of cities today. This paper will employ similar methodologies to Dell (2010) and Ambrus et al. (2020), however it will build on this regional literature to examine the impact of history on another important aspect of economic development, the allocation of FDI today.

Section 2.2.2: The Effect of History and Institutions on Culture

While it is evident from this discussion that history matters for economic development, history can also have lasting effects on cultural development. One important characteristic that history can affect is trust. Rather than examining the historical effect on income or consumption, Nunn and Wantchekon (2011) examine the role of history on trust in the context of the slave trade in Africa. They find very strong impacts of the number of slaves taken from an individual's ethnic group on an

individual's trust in others today. The authors hypothesize that individuals carry culture with them while institutions are fixed in place. They use this definition to see which effects, culture or institutions, have a bigger impact on trust. If culture matters more, it should matter whether an individual's ancestors were enslaved. If institutions matter more, it should matter whether an individual currently lives in an area that was historically affected by the slave trade. The authors find evidence that both factors matter, but the effect of culture is stronger than the effect of institutions on trust.

Exploiting the location of the Habsburg empire in Eastern Europe, Becker et al. (2014) show that the Habsburg empire had persistent effects on the trust of individuals living in former empire regions today. The authors use the 2006 Life in Transitions survey data and employ a border specification to test whether individuals living in cities within 200 kilometers of the Habsburg border have higher trust in courts and police today. In addition, to higher trust in institutions, the authors also show that the Habsburg affiliation also impacts the extent to which individuals feel that they must pay bribes in courts or to police. The authors propose that the Habsburg empire established cultural norms which are still present in the interactions of individuals with their respective institutions today. This paper lays an interesting and compelling foundation for my study. Since the empire affected cultural and social norms in former empire territories, this setting is an important one in which to examine the impact of these norms on FDI. It has long been recognized that culture can impact the allocation of FDI but compelling evidence, especially at the local and regional level, is limited.

Section 2.2.3: Culture, Institutions, History, and FDI

There are several determinants of FDI that are well known. Of these determinants, one of the most important is distance. Distance can make international exchanges costly (Makino and Tsang, 2011). Geographic distance increases transportation costs. Institutional distance affects the success and profitability of a prospective firm in a new location, as both formal and informal institutions define the rules of the game that shape economic exchanges and interactions (North, 1990). Historical ties are important in reducing costs since they can shape shared values, norms, and cultural beliefs. Historical ties can also affect expectations and reduce uncertainty in international exchanges (Makino and Tsang, 2011). Rangan (2000) argues that historical ties make the search and assessment of potential locations easier and less costly while also making ongoing operations more efficient. Additionally, interactions among countries which share historical ties may result in a positive feedback loop, where any similarities in cultural norms or institutions positively reinforce historical ties. This can also serve to narrow the "distance" between countries. Cultural distance can also be costly. Cultural distance can create behavioral uncertainty and can affect an investor's commitment to invest. Furthermore, it can impact the performance of the foreign firm in the new market. For these reasons, understanding the intricacies of culture and its effect on FDI is imperative to business leaders. Several studies find evidence of this effect (Beugelsdijk et al., 2018).

Makino and Tsang (2011) examine the importance of historical ties in the timing of FDI flows into Vietnam following the market opening. The authors show that culture has a differential impact on the timing of investment. Specifically, the authors find that investors from Mainland China moved in later than investors from Taiwan and Hong

Kong. This is a significant finding since Vietnam has historically experienced strained relations with Mainland China following the Sino-Vietnamese War. The authors also show that investors from socialist countries were early movers. This is a similar finding to Crane et al. (2005) who find that Russian investors are more likely to invest in former Soviet Republics today. Additionally, Makino and Tsang (2011) show that colonial ties can matter through their finding that French speaking countries were early movers.

Glaister et al. (2020) examine the effect of prior colonial relationships on FDI in Africa. This is an excellent setting in which to examine this issue as Africa's history is best characterized by colonialism. Colonialism has persistent impacts on the language, institutional structures, and business practices of former colonies. Each of these factors can reduce the liability of foreignness (Liou and Rao-Nicholson, 2017). History can also create informal institutions that are hard to overcome. The ingrained image of a country or a potential investor, is an example of an informal institution that can form through historical ties. This could be a positive image or a negative stigma that is associated with the investor, affecting the subsequent success of the foreign investor (Glaister et al., 2020). For example, former colonies may experience negative feelings towards their colonizer stemming from past labor exploitation, and resource depletion (Jones, 2013, Nunn, 2007). Glaister et al. (2020) find a positive effect of prior colonial ties on inward FDI; however, the nature and influence of these historical ties are more complex than previously considered and vary with the colonizer. There is a positive effect on inward FDI from British investors. The authors suggest that British colonizers engaged in greater institutional development than other colonizers. This may have resulted in a positive historical tie between countries, making former colonies more open to receiving

investment from British investors. The authors also find that the length of the colonial period negatively affects inward FDI, while the length of independence exhibits a u-shaped effect. Immediately following independence, due to a recent association of oppression, there is a negative effect on FDI. However, with time, the benefits of a longer shared history outweigh the negative effects of colonialism, generating a positive effect of the length of independence on FDI. While making important theoretical contributions for the importance of culture and history on FDI, both Makino and Tsang (2011) and Glaister et al. (2020) only present evidence of the importance of culture on FDI at the country level.

Only a few other papers examine discontinuities in FDI and trade within countries. Ma (2017) examines the effect of language on the allocation of FDI in China. Ma (2017) examines investments from Hong Kong, Macau, and Taiwan at the borders of various dialects in China to show that cultural similarity increases FDI. Egger and Lassman (2015) examine import behavior at native language boundaries in Switzerland to show that culture can affect international trade. They find that on average more products are imported from areas with a common native language (Egger and Lassmann, 2015). Both of these papers are methodologically similar to my paper in that they take advantage of the regional heterogeneity of culture within a country to estimate the impact on FDI or trade today. However, as discussed in previous literature, language is only one small facet of culture. It is cultural norms that can be more impactful. North (1995) suggests that while formal institutions can quickly change, informal institutions are less likely to change and may even endure over time. Since cities on either side of the long-gone Habsburg border have shared common institutions for the last 100 years, I do not

argue that formal institutions impact the allocation of FDI today. Rather it is the informal institutions, or the cultural norms, that can impact the allocation of FDI. Becker et al. (2014) show that Habsburg empire affiliation affected the trust in institutions and perceived corruption that individuals living in former empire territories have today. However, based on these findings, it is not directly evident how this could affect FDI. It is possible that the empire affiliation shaped the cultural norms of individuals and therefore impacted the functioning of the same institutions today (Tabellini, 2010). However, if the only impact of the empire affiliation is the functioning of local institutions, there would be a discontinuity in all FDI at the border. If the empire affiliation affected cultural norms through a historical tie, there should only be a discontinuity in FDI originating from other former Habsburg territories. To my knowledge this paper is the first to test these factors along with the intricacies of culture and historical ties and their effects on FDI at a regional level. In order to understand the context and mechanisms through which the empire affiliation may have impacted the allocation of FDI today, it is important to understand the history and influence of the Habsburg empire in Romania and Serbia.

Section 2.3: The Historical Background of the Habsburg Empire

The royal house of Habsburg was one of the most powerful and influential families in Europe. As early as the 11th century the house had acquired lands as far west as Spain and as far as Galicia (Poland) in the East. The association of the Habsburg name with Austria began when Rudolf IV of House Habsburg, ascended to the throne of the Holy Roman Empire in 1273. After that time, the empire continuously expanded

eastward through wars until more than half of Europe was controlled by the House of Habsburg (Becker et al., 2014).

The major influence of the empire in Eastern Europe began when Ferdinand of Austria was elected King of Hungary, Croatia, and Bohemia. It was at this time that the Austrians had to seriously contend with the force of the Ottoman Empire. The Habsburgs drove further into Eastern Europe, each time pushing the Ottoman Empire back even further. In 1684, the Ottomans failed to capture Vienna for a second time which marked the beginning of the Habsburg dominance in Eastern Europe (Becker et al., 2014).

One of the defining characteristics of the empire is that even though the empire was composed of many states and cultures, the ruling class largely respected and protected its citizens. The citizens recognized this and considered the bureaucracy to be reliable, honest, and hard-working. The laws were fair and efficient, and it was the legal system that served as a uniting factor throughout an empire composed of many different ethnic groups. The ruling style of the empire was very decentralized until the rule of Maria Theresa in the mid-18th century. She established a set of governors that would supervise local administrations throughout the empire. Once a new territory fell under Habsburg rule, the old administration was abolished, and a new Austrian governor would be installed. This governor was charged with establishing a new local administration, often filling roles with natives that had been sent for training in Vienna. Due to the competency of the Austrian trained administration, these institutions sometimes remained in place even after a territory became autonomous (Becker et al., 2014).

Maria Theresa's son, Josef II, carried on this legacy and enhanced her policies by instilling legal reforms, ending censorship, and promoting education. Josef also went on

to found institutions of social and medical care and laid the foundations for infrastructure development. Josef gave subsidies to fund infrastructure projects such as railroads in less developed parts of the empire in order to encourage integration (Becker et al., 2014). This included highway development and improvements in the navigability of the Danube River and the Save and Kulpa Rivers in Hungary. By 1800, 7,460 km of highways were in existence throughout the empire. By WWI, 40,000 km of railways were built throughout the empire. Connecting the financial heart of Vienna to major cities throughout the empire was important for the unity of the empire as well as for the transportation of goods and services which would lay the foundation for economic growth (Good, 1984).

Throughout the 18th century, the empire made a conscious effort to industrialize and develop. Mercantilist policies were enacted to develop the agricultural regions of the empire. In the Bohemian lands, subsidies were given to machine builders and inventors were given exclusive production privileges for several years. The textile and iron industries also experienced lessening restrictions. Political advisors tried to encourage the movement away from agriculture by encouraging manufacturing in Hungary and the less developed regions of Austria. Plans were made to increase Hungarian productivity in the areas of textile, leather, paper and wood products, and iron manufacturing. Tariff barriers were reduced or eliminated (Good, 1984).

In the 18th century, the economic development of the empire was split between west and east. The western portion of the empire was much more industrialized while the eastern portion was more agrarian. According to several historians, economic development started in the western portion of the empire and slowly moved east. During

this time, the western portion of the empire had several strong industries. These industries included a strong linen/woolen textile industry as well as a glass industry and chemical industry. Austria was a strong center of mining and metallurgy. By the late 1700's, Austria was one of the largest producers of pig iron in all of Europe with the Styrian region in Austria producing more iron than all of England. At this time, the Eastern portion of the empire was specialized in grain and livestock production (Good, 1984).

In Hungary, the main strength was the flour milling industry. Croatia-Slavonia had some grain production, but it could not compete with the output from Hungary. This pushed the Serbian region towards livestock production. In Transylvania, the main industry was mining and metallurgy. The expansion of the rail and credit networks in the region allowed Transylvania to have easy access to Budapest. This stimulated the industry further allowing the region to become a major exporter of coal, pig iron, and timber. In the years leading up to WWI, Transylvania and Croatia-Slavonia had much larger industries and industrial output than their neighbors: Romania, Serbia, and Bulgaria (Good, 1984).

A turning point for the empire occurred in 1866. In 1866, Austria was defeated and considerably weakened in the Austrian-Prussian War. This forced Austria to relinquish control of Lombardy-Venetia to Italy and with the dissolution of the German Confederation, it also lost its status as the leader of the German speaking states. The war left Austria in great deal of debt (Republic of Austria Parliament, 2020). It was around this time that the current emperor, Franz Joseph decided to reexamine the empire's affairs. By this time there was unrest in the empire as many ethnic groups, especially the Hungarians, were demanding equal status with the Austrians. In fear of losing even more

power, the Austrians engaged in negotiations with the Hungarians which ended in the Ausgleich of 1867. This compromise regulated the relations between Austria and Hungary and created the Austro-Hungarian Empire. Through the negotiations, it was decided that the Hungarians would have full internal autonomy. The two powers would remain united for war and other foreign affairs and would operate under a customs union which would be reevaluated every ten years. Austria and Hungary would both have their own constitutions, with their own governments, and parliaments. The parliament was composed of an appointed upper house and an elected lower house. They both remained under the rule of a common emperor, his court, and ministers of foreign affairs and war. Franz Joseph was crowned the King of Austria-Hungary and Gyula Andrassy was named the first prime minister of Hungary (Republic of Austria Parliament, 2020).

Even under the newly organized empire, many of the laws protecting citizens' rights remained. The Fundamental Laws, which became known as the December Constitution, were instated in 1867 and lasted until the dissolution of the empire. These laws ensured equality, freedom of speech, press and assembly and protected the rights of minority groups. They proclaimed that "all nationalities in the state enjoy equal rights, each one having an inalienable right to the preservation and cultivation of its nationality and language." The equal rights of all languages in local use were guaranteed by the state in schools, administration, and public life (Republic of Austria Parliament, 2020).

The history of Transylvania and Serbia is complicated, political, and even controversial. In the next section, I discuss the important distinguishing characteristics of the regions to shed light on the influence of the empire in these regions.

Section 2.3.1: Transylvania

Transylvania was historically governed by princes and a Diet. The Diet was an administrative body composed of Hungarian nobility, German Saxons, and Szekely Hungarians. This group often referred to themselves as the three nations. This group decided on all economic, legal, and military matters even though the majority of the population in the area was ethnically Romanian. The Romanians in the area held little power; they were mostly peasants that worked under serfdom for Hungarian noblemen. As they were not fairly represented by legislative bodies, clashes and protests between the Romanians and Hungarians often ensued (Encyclopedia, 2020).

After Austria defeated the Ottoman Empire in 1684, the Habsburg monarchy started to impose their rule in Transylvania. They strengthened the government and promoted the Catholic Church. In 1711, the Transylvanian princes were replaced by Habsburg governors. In 1765 the Grand Principality of Transylvania was formed. This granted Transylvania a special status as an independent state within the Habsburg monarchy (Encyclopedia, 2020). This time period, however, was not peaceful; the area experienced civil unrest due to competing interests between the large ethnic groups. In 1784, the Romanians revolted against the Hungarians, demanding political and religious equality with other ethnic groups. The rebellion was crushed, and no reforms were made. In 1791, the Romanians again demanded religious equality from the Habsburg emperor to no avail. In 1848, during the revolutions, the Hungarian parliament proposed the union of Transylvania with Hungary. Romanians were at first optimistic about the union because they hoped that it would bring much needed reforms. However, they quickly realized that the Hungarians would not support Romanian national interests. A Romanian Diet was

formed which requested proportional representation in the Transylvanian Diet along with an end to the social and ethnic oppression of Romanians. The Saxons supported the Romanians as they also opposed the union with Hungary for fear that they would lose their class status in Transylvania. The vote to join Hungary was pushed through regardless of the opposition from many groups. This move led to a war within the area between the Romanians/Saxons and the Hungarians. The Hungarians were eventually defeated but requested that national borders be drawn along ethnic boundaries, giving them control of Transylvania. The Austrians declined this request because they favored the creation of a Romanian province which would unite Transylvania, Banat, and Bukovina (all areas of the Habsburg empire with high concentrations of Romanians). The empire at the time was trying to balance civil unrest along ethnic lines with the desire to maintain a united empire. They feared that if not supported, the Romanians would also desire to separate from the empire. The year following the revolution was characterized by many small battles and civil unrest which was eventually quelled by the Austrians. After the wars ceased, the Austrians imposed a repressive regime on Hungary and ruled Transylvania through a military regime, making German the official language. The Austrians acknowledged the Romanian citizens, giving them land to farm but living conditions were generally poor (Encyclopedia, 2020).

The start of the Austro-Hungarian empire in 1867 marked the end of autonomy for Transylvania and Serbia. As a result of the Ausgleich, Transylvania was no longer considered a separate state, it was now a province ruled by the Hungarian Diet. During this time, Romanians were oppressed under Magyarization, or the process of Hungarian cultural assimilation (Encyclopedia, 2020). However, this time period was not all bad for

the Transylvanian region. The Austro-Hungarian empire brought forth infrastructure development and the boom of industry in the area. Prior to 1867, Transylvania did not have a rail network. By 1910, rail density in Transylvania was 96 km per 100,000 people. This level of development was comparable to the more developed regions of Austria and far exceeded the established rail networks on the other side of the border. For reference, in Romania rail density averaged around 49 km per 100,000 people at this time (Good, 1984). These types of projects were financed by two Austrian companies, the Staatseisenbahn-Gesellschaft and the Danube Steamship Company. These companies not only invested in railways but also waterways and coal mining industries in the Hungarian empire. In addition to infrastructure development, banking and capital networks were also developed by the late 1860's. There were six main bank branches throughout the empire, one of which was located in Brasov (Transylvania). From 1890-1913, the eastern part of the empire experienced an industrial revolution and an emergence of industry. This timing was concurrent with the diffusion of the rail and credit network. During this time, capitalism spread throughout the eastern regions and Austrian capital financed large investments in infrastructure and the expansion of the agriculture and food processing industries. Some of the innovation that occurred included the mechanization of farming practices as well as the introduction of artificial fertilizers (Good, 1984). After World War I and the collapse of Austria-Hungary, the deputies of Transylvanian Romanians declared the union of Transylvania with Romania on December 1st, 1918.

Section 2.3.2: Serbia

The association of Serbia with the Habsburg empire began during the Great Serb Migration, a time when many Serbians fled Ottoman rule and settled into the Habsburg Monarchy. During this time, Serbians settled in the lower half of Hungary with a large portion also settling in the Vojvodina area of northern Serbia. The Habsburgs provided these Serbians special rights, recognizing them as their own nation within the empire, in exchange for the provision of a defense against potential invaders, namely the Ottoman Empire. In 1716, the Austrian government temporarily forbade settlement in the area by Hungarians while allowing German speakers to move in to repopulate the area and develop the agricultural sector. During 1848, the area experienced civil unrest between the Serbs and the Hungarians. Following the defeat of the Hungarians in 1849, a new administrative region called the Voivodeship of Serbia and Banat of Temeschwar was formed. This region was an Austrian crown land but was autonomous. In 1860 this was abolished, and the region again became a Hungarian crown land at the decision of Franz Joseph, the current emperor of Austria-Hungary. As in Transylvania, the region experienced great economic growth during empire rule, however ethnic relations were tense during this time (Britannica, 2020b).

Section 2.4: Hypotheses

From this discussion, I infer several hypotheses on the lasting effect of the historic and cultural ties with the Habsburg empire. The first hypothesis describes the view of the empire in Romania and Serbia. I propose that Romanians and Serbians positively view their association with the former Habsburg empire and, as an extension, there exists a positive relationship between countries that share this affiliation. This stems from the fact

that the empire frequently protected both Romanians and Serbians from their oppressors while also allowing them to enjoy long periods of autonomy. In addition, the empire promoted the development of fair and well-functioning institutions while also investing heavily in infrastructure. This led to great economic growth in these former empire territories. Even though periods of time were characterized by ethnic clashes, the length of independence should outweigh any short-term negative associations with the empire that may have occurred. For these reasons, I expect to find a greater number of investments from countries affiliated with the empire in former Habsburg territories. The best identification of the effect of culture on FDI comes from local variations in culture which should be localized to the former empire border.

The second hypothesis builds on the first by proposing that some historical ties may be stronger than others. Throughout history, Romanians and Serbians were often oppressed by the Hungarians and as a result often engaged in battles over territories. Pockets of Romania and Serbia still have significant Hungarian minority populations. In Romania specifically, cultural and political tensions between Romanians and Hungarians still exist. It is possible that Hungarian investors would be more drawn to areas with large Hungarian populations due to language and cultural similarities. Since Austrian capital financed most of the infrastructure and industry development in the former empire territories, I propose that Austrians formed the strongest ties in these areas.

Section 2.5: Data

The primary data used in the analysis come from fDi Markets, a database maintained by the *Financial Times*, which tracks cross-border greenfield investments from 2003 to 2018. This database is unique in that it identifies many details about each

investment project. It provides the source and location of each investment, in most cases down to the city level. It also provides the industry of each investment project as well as the size of the investment as measured by the amount of capital invested and the number of jobs created. From 2003-2018, there were a total of 2,221 projects identified in 217 cities in Romania and 910 projects identified in 115 Serbian cities. Estimation of the model requires the precise location of each city. I use GeoNames to obtain the geographic coordinates and the population of each city in the data set. In addition to the cities with investment projects, I also include cities in Romania and Serbia that did not receive any foreign investment to avoid any selection issues. I include all cities in Romania and Serbia that are considered seats of administrative divisions. In addition to these cities, I also include all populated places with 5,000 or more individuals. The average population of cities with foreign investments is 6,113. I choose to include all populated places with populations above 5,000 individuals in order to capture all similarly sized cities that may have also been considered for investment. This results in a total of 3,018 cities in Romania and 157 cities in Serbia, for a total of 3,175 cities in my sample. After obtaining the city coordinates, I used ArcGIS software to map the cities, the current country borders, and the historical empire border. I use this software to calculate the geodesic distance from each city to the nearest point on the former empire border in kilometers.

The analysis is performed at the city level. To form the dependent variable, I construct a measure of FDI per capita[2]. To do this, I calculate the number of "Habsburg"

[2] Another specification that was considered is the value of FDI coming from Habsburg investors. This method was ultimately not chosen as the amount of capital invested and the number of jobs created with each investment project are highly correlated with the industry of the investment. To my knowledge, there are no theories which suggest that foreign investors invest more capital in an area because these investors share a cultural

projects in city *i*, from 2003-2018. This measure is then scaled per 10,000 individuals as this corresponds to the average population of the cities in my sample. I define a Habsburg project as any investment coming from Austria, Hungary, Czech Republic, Slovakia, Slovenia, Croatia, or Bosnia-Herzegovina. These countries were selected since they were completely contained within the boundaries of the Habsburg empire from 1867-1918, the period of time that regions of Romania and Serbia also officially belonged to the empire.

The analysis also requires data on location-specific characteristics that may impact the allocation of foreign direct investment. Ideally, these data would be available at the city level; however, this is not readily available for every location in my data set. The smallest statistical unit for which I can collect data is the municipal or district level.

In the European Union, each member country is divided into various regions for statistical purposes. This classification system is called the Nomenclature of Territorial Units for Statistics, or NUTS for short. Eurostat specifies three NUTS levels in each country. These levels are based on existing institutional divisions within each country as well as on certain population thresholds. The largest classification is NUTS1 and the smallest classification for which data is collected is NUTS3. The average population of the NUTS3 division is between 150,000 to 800,000 individuals. All Romanian data on economic and demographic characteristics are obtained from Eurostat at the NUTS3 level as of 2016, the most recently published Romanian data. Serbia is not in the European Union; however, it is a candidate country and therefore is in the process of transitioning to the NUTS classification system for data collection. The smallest administrative unit in

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tie. This paper explores the theory that certain countries share a tie and therefore this tie increases the probability of investment in a given region. This effect would be captured by the count rather than the value of FDI.

Serbia is a district. Serbia currently has 24 districts that are proposed to be equivalent to the NUTS3 classification. All Serbian data come from a report on the municipalities and regions of Serbia published by the Statistical Office of the Republic of Serbia. I draw on data from the 2017 publication of this report which provides information for Serbian districts as of 2016.

In Romania, the location characteristics considered are land area measured in square kilometers and the following population characteristics: population density per square kilometer, median age, and GDP per capita. I also include information on total employment, and employment by industry. The industries considered are manufacturing, IT, and agriculture. Since educational characteristics are not available at the NUTS3 level, I also include information on the total number of professional, scientific, or technical establishments and the number of EU trademark applications in an effort to capture human capital differences across regions.

I obtain similar regional, economic, and demographic characteristics for Serbia. For Serbia, I examine statistics on land area measured in square kilometers, as well as the following population characteristics: population density per square kilometer, average age, average net salary per employee, as well as the average annual number of workers employed in various industries. The industries included are agriculture, manufacturing, finance and insurance, and real estate. These data serve to establish the industrial profile of the regions in the analysis.

Section 2.6: Identifying the Effect of Culture on the Allocation of FDI

In this study I implement a spatial regression discontinuity design to test whether there is a discontinuous increase in Habsburg investment at the former empire border in present day Romania and Serbia. This method allows an identification of within country variation in the allocation of FDI that can be directly attributed to cultural and historical differences. The former empire had a boundary which split present day Romania and Serbia in half. I present evidence that this empire affiliation had persistent cultural effects on the people living in these former empire regions. Perhaps the most important cultural effect is the formation of historical business ties among countries sharing an affiliation with the former Habsburg empire. I take advantage of this variation in culture along the former boundary, to identify differences in the location of FDI at the border. Cities on either side of this boundary share a common language and religion. Additionally, cities located on either side of this border have shared common institutions for over 100 years. These features allow me to separate the effect of culture from the effect of institutions, language, and religion which are often entangled in other definitions of culture used in previous studies examining the effect of culture on FDI. I follow the literature in implementing a one-dimensional forcing variable, distance to the former empire border in kilometers. In order to estimate how culture impacts FDI at the former empire border, I estimate the following equation:

$$FDI_{Habsburg_i} = \beta_0 + \beta_1 Empire_i + f(D_i) + Empiref(D_i) + c_j + \epsilon_i$$

where $FDI_{Habsburg_i}$ represents the number of Habsburg projects per 10,000 individuals in city i. $Empire_i$ is a dummy variable which is equal to one if city i is located within a region that formerly belonged to the Habsburg empire. D_i represents the distance from

city i to the historical border measured in kilometers. c_j represents location country fixed effects which control for any country-specific factors, such as formal institutions, language, and religion which could all impact the allocation of FDI today.

I present two estimations of this model. In the first estimation, I present results from a local linear approach where $f(D_i) = D_i$. In this estimation, I follow the literature and use an optimal bandwidth of 84.84 kilometers, as determined by the methodology proposed by Calonico et al., (2014). In the second estimation of the model, I include various orders of polynomials of the distance variable as controls which is captured by $f(D_i)$. The coefficient of interest in all of these estimations is β_1, which reflects the role of Habsburg culture on FDI.

This empirical analysis requires several important assumptions. The first assumption is that if Habsburg investment is an important determinant of FDI, there should exist a discontinuity, or a jump, in foreign investment coming from former Habsburg investors as one moves into the former Habsburg territory. The second assumption is that foreign investment coming from the rest of the world does not change discontinuously at the border. This is an important feature because if foreign investment coming from the rest of the world also jumps at this border, it is likely that these regions provide better business environments for foreign investors. In order to attribute the change in investment patterns to culture, it must be the case that only Habsburg investment is impacted at the former empire border. The final necessary assumption is that any other factor that may impact the spatial allocation of foreign investment is continuous at this border. If these assumptions hold, it is reasonable to conclude that any increase in Habsburg FDI at the border can be attributed to a Habsburg cultural effect.

To test these assumptions, I create a similar measure of FDI per capita by calculating the number of "Rest of the World" investments in city *i*, from 2003-2018. This measure is also scaled per 10,000 individuals for consistency. I replace the dependent variable in equation 1 with FDI_{ROW_i} to formally test the first assumption. I repeat this process with each of the location characteristics collected to test the validity of the final assumption.

Section 2.5.1: Graphical Analysis

Before presenting the results from the regression model, it is important to examine the distribution of Habsburg investment near the border. Figure 2.1 presents the density of investment projects in Romania and Serbia. Figure 2.1 (a) depicts projects from Empire investors. While there are clearly some investments that are being drawn to the capital city of Bucharest, it appears that Habsburg investments are almost completely contained within the former empire territory. Figure 2.1 (b) provides the density of projects from the rest of the world. In contrast to previous results, there is no clear pattern for these investors. These investors appear to be geographically distributed throughout both countries, with the largest cities drawing more investments. Figure 2.2 plots the location of Habsburg and ROW investments respectively, with larger circles representing a larger number of projects per capita. These figures present similar evidence for Habsburg investors. Empire investment projects occur almost exclusively in former empire territories while ROW projects are more or less evenly distributed throughout Romania and Serbia.

Next, I present the graphical evidence of a discontinuity. Figure 2.3 (a) plots the average number of Empire FDI projects per 10,000 individuals over various distances from the border. The horizontal axis indicates the distance in kilometers from the empire

border. Positive values represent the distance from the border to cities within the former empire territory, while negative values represent the distance from the border to cities that were never in the empire. While the average number of Habsburg FDI projects is relatively low across Romania and Serbia, there is a striking jump in the average number of Habsburg projects that is only evident within 100 kilometers of the border in the former empire territory. Figure 2.3 (b) plots the average number of ROW projects per 10,000 individuals over various distances from the border. In contrast to the previous figure, there is no evidence of a discontinuity in projects from the rest of the world. ROW investments are flat across the former empire border. The only spikes in ROW projects seem to correspond with larger cities that fall on either side of the border. This establishes the fact that Habsburg investors are being drawn to the former empire territories of Romania and Serbia. Since this pattern does not exist for investors from the rest of the world, these graphs provide initial evidence that the discontinuity found is not solely indicative of a better business environment for all foreign investors.

A valid regression discontinuity design requires that all other factors that may impact the spatial allocation of FDI in both Romania and Serbia remain continuous across the former empire border. I present graphical evidence of this by country as these statistics are drawn from different sources for Romania and Serbia. The statistics presented are as of 2016, the most current year available for both countries.

When examining the factors that may impact the allocation of FDI in Romania, it is evident that most demographic and industry characteristics are continuous across the border. Demographic characteristics such as median age, population density, and GDP per capita are continuous, which indicates that there are no significant human capital

differences across regions. While it would be preferable to have data on the educational characteristics of the population in these areas, these data are not available. More compelling evidence of this is reflected in the graphs depicting the number of EU trademark applications, IT employment, and the number of professional, scientific, or technical establishments. Each of these graphs provide evidence that no trend or discontinuity exist across the former empire border, suggesting that the educational characteristics of the individuals living in these areas do not differ significantly. There are two important industrial characteristics to note. First, there is an observable trend in manufacturing employment across the border. Second, there is a significant difference in agricultural employment across the border. These differences in the industrial characteristics of the regions could be persistent effects of the Habsburg empire affiliation. Under Habsburg rule, the empire invested heavily in the development of industry and infrastructure, especially in the eastern portions of the empire. Towards the end of the 19th century, the Transylvanian area no longer focused on agricultural production but instead focused on producing timber and iron (Good, 1984). The affiliation with the Habsburg empire, may have propelled the former empire territory towards other industries while the non-empire territory may have lagged behind.

Interestingly, differences in economic development as captured by the GDP per capita and other measures of the industrial employment of individuals living in these areas, do not persist. These are important findings; however, these factors still do not explain the discontinuity observed in the number of Habsburg projects. The top industries of investment for Habsburg investors are real estate and financial services. This means that the trends in manufacturing and agricultural employment alone cannot explain the

pattern of Habsburg investment. While agricultural employment is significantly lower in the former Habsburg territory, this factor does not seem to affect the allocation of FDI from the rest of the world, as there is no difference in the amount of FDI coming from the rest of the world across this border. This suggests that Habsburg investors are being drawn to areas where they hold cultural and historic business ties.

In Serbia, the capital city of Belgrade falls on the former Habsburg empire boundary. In addition, five large cities fall within 5 kilometers of this border. It is likely that some investors may choose to locate in these cities in order to be in close proximity to Belgrade. In order to prevent these large cities from skewing the results, I drop them from the main analysis. Figure 2.5 depicts the factors that may influence the spatial allocation of FDI in Serbia, excluding Belgrade and the five large cities that were dropped from the analysis.

The graphs depicting Serbian characteristics present a similar story to that of Romania. In Serbia, there is a statistically significant difference in manufacturing and agricultural employment across the former empire border. This again indicates some evidence of the Habsburg influence on the industrial development of the region. While these graphs depict evidence of a few discontinuities in the economic and demographic characteristics of the regions of Serbia across the empire border, none of these characteristics explain why Habsburg projects per capita are higher in the former empire region of Serbia. As in Romania, the main industries that empire investors are associated with are service industries; primarily real estate and financial services. Investors from the rest of the world are also associated with service industries but they also invest in the automotive and manufacturing industries. Yet, even these investors are equally likely to

invest along either side of the border. Furthermore, when including all cities except for Belgrade in the analysis, there is no evidence of a discontinuity in any of the characteristics that may affect the allocation of FDI in Serbia, which provides a further indication that any effect captured by the model can be attributed to a Habsburg cultural impact. These additional graphs are included in the appendix for additional robustness.

Section 2.7: Results from the Regression Discontinuity Models

The main results of this analysis come from estimations including all cities in Romania and Serbia with populations of at least 5,000 individuals. It is important to include all possible cities that could have been selected by foreign investors to avoid any selection bias. However, once accounting for these additional cities, the sample size increases from 326 cities to 3,175 cities. For this reason, it is important to verify that the main results obtained from the model are not solely being driven by an increasing sample size. Before presenting the main results of the analysis using the full data set, I present the results for the subset of the data that features only the cities that were selected for investment. Table 2.1 presents these results. The results indicate that there are between 1.2 and 1.5 additional empire projects per 10,000 individuals at the former empire border. These results are robust even when including the five cities surrounding Belgrade. Results from an estimation including these five cities are presented in the appendix.

Table 2.2 reports the main estimation results of the analysis using equation 1 and $FDI_{Habsburg_i}$ as the dependent variable. In this table, I only report the estimate of β_1, the coefficient on the empire indicator variable, which measures the empire treatment effect that I capture with the spatial regression discontinuity design. The treatment effect

captured is the estimated discontinuity in empire investments at the border. Each column in the table represents a separate estimation of the same equation. In the first three columns, I present results using the full sample and various orders of polynomials of the distance to the border as control variables. The fourth column presents the results from a local linear approximation of the equation with a bandwidth of 84.84 kilometers on either side of the border. This optimal bandwidth is obtained using the methodology proposed by Calonico et al., (2014).

All model estimates show statistically significant results that show direct evidence of a sharp increase in empire projects per 10,000 individuals at the border. The magnitude of this increase ranges from 0.24 to 0.32 additional empire investments per 10,000 individuals. This is robust to various specifications of the model and various bandwidths. In Table 2.3, I present results from estimations of the model including a second order polynomial of distance as a control over various bandwidths. These bandwidths range from the full sample size of approximately 200 kilometers, to 42 kilometers from the former Habsburg border. Only in the narrowest bandwidth of 42 kilometers does the estimate lose its significance. All other results presented are statistically significant at the 5 percent level and are stable, with around 0.3 additional Habsburg investments per 10,000 individuals. In Table 2.4, I present the results from a local linear approximation of the model again using the same range of bandwidths. In this estimation, the results are again stable and statistically significant, even using the narrowest bandwidth. These tables provide evidence that the main results of the model are not sensitive to bandwidth or model choice.

Section 2.8: Alternative Specifications of the Model

Throughout Habsburg rule, Romanians and Serbians often engaged in disputes with their Hungarian neighbors. The regions of Romania and Serbia formerly belonging to the Habsburg empire still maintain large Hungarian populations. However, the relations of Romanians and Serbians with these groups are still strained. In Romania, the large Hungarian groups of Transylvania still demand their independence. For this reason, it is important to check that the discontinuity in Habsburg investment is not solely being driven by Hungarian investors that are locating in regions where Hungarian is spoken. Figure 2.6 (a) shows the average number of FDI projects made by Hungarian investors per 10,000 individuals. In this figure, there is no evidence of a discontinuity at the Habsburg border. This is an important finding because it suggests that the main results of the model are not solely driven by Hungarian investment. Interestingly, there is evidence that investment gradually increases in the former empire territory, especially as distance from the border increases. This indicates that Hungarian investors may be locating in regions that are primarily Hungarian. Since the average number of Hungarian projects increases with distance from the empire border, it is likely that Hungarian investors are locating in cities that are closer to the border with Hungary. This is consistent with my second hypothesis. Due to potential negative associations that Romanians and Serbians may hold for Hungarians, Hungarian investors may choose to locate in areas that are predominantly Hungarian, where such investments may be viewed more positively by the local community. Figure 2.6 (b) shows the average number of FDI projects per 10,000 individuals from all Habsburg investors excluding Hungary. Even after excluding the Hungarian investors, there is clear evidence of a discontinuity at the Habsburg border. In

fact, the graph looks almost identical to the graph using the main investment group. This reinforces the fact that the results are capturing evidence of a Habsburg cultural effect.

Throughout the history of the empire, Austria served as the heart of the Habsburg empire. Historically, Austrian leaders managed the transition to Habsburg rule, and it was Austrian capital that invested in infrastructure development and the development of industry in the Eastern regions of the empire. For these reasons, it is likely that Austrians formed stronger historic business relationships in former Habsburg territories than other former Habsburg members. To test this hypothesis, I examine the effect of the Habsburg border on the number of Austrian investments per 10,000 individuals. Table 2.5 presents the results from the two specifications of the model considered in the main analysis. The results are statistically significant for the local linear and second order polynomial estimation of the model, with estimates of approximately 0.09 additional Austrian investments per 10,000 individuals at the border. While the estimates lose some precision when incorporating higher orders of polynomials, this specification of the model suggests that Austrian investors hold important historical and cultural ties to communities in the former empire regions of Romania and Serbia.

Section 2.9: Robustness Checks

In this section, I consider two additional robustness checks. In the first check, I include a set of border fixed effects for the main analysis. To implement this approach, I divide the former Habsburg border into 15 equal segments. When calculating the distance from each city to the border, I identify the segment of the border that each city in the sample is closest to. I choose to include these controls in the analysis in order to control for varying regional characteristics along the historical border. For example, in Romania,

some regions along the border in the former Habsburg territory, have large groups of Hungarian speakers. Additionally, in Serbia, the capital city of Belgrade falls on the border of the former Habsburg empire. While Belgrade and five other neighboring cities are removed from the main analysis, the estimates could still be capturing some agglomeration effects in the region. I present the results controlling for these factors in Table 2.6. The estimate remains statistically significant at the 5 percent significance level across all specifications of the model. The estimate is stable ranging from approximately 0.24 to 0.32 additional Habsburg investments per 10,000 individuals.

In the final robustness check, I manipulate the location of the Habsburg border to verify whether any other discontinuities exist in the data. If the initial estimate obtained is solely a "Habsburg" effect, there should not be any discontinuity associated with any other "false border". To test this assumption, I check for evidence of a discontinuity using false borders located in 25-kilometer increments from the true Habsburg boundary. I find no evidence of a discontinuity on either side of the true border, further indicating that the effect uncovered in the analysis can be attributed to a "Habsburg" cultural effect. The results from this analysis are summarized in Table 2.7.

While these robustness checks provide evidence that the main results are not being driven by other measurable factors, future research should investigate other data sources to improve the model. The model could benefit from the addition of better demographic characteristics including educational profiles of the regions as well as language and other cultural characteristics. The language characteristics would be especially important in proving that empire investors are not only being drawn to territories where a higher proportion of the population speaks a common language. It is

well known that that the former empire territories in Romania and Serbia still contain large Hungarian groups, however, without good regional data on the languages spoken in these areas, it is difficult to verify whether there is a jump in the number of people speaking Hungarian at this former empire border. It is also important to evaluate whether there exists a jump in the number of people speaking German at this border. Additionally, it would be interesting to test this same effect at the current country border. This would allow me to verify the size of the impact relative to the impact found in this study. Similarly, it would also be interesting to perform the analysis using a larger sample size and additional countries. The former Habsburg border ran through several other present day countries including Poland and the Ukraine. Future research should also further investigate the industrial composition of the region and the investors. It would be interesting to examine the patterns of investment by industry and nationality of the investor to determine whether agglomeration characteristics matter for all types of investors.

Section 2.10: Conclusion

This paper demonstrates that previous Habsburg empire affiliation impacted the allocation of FDI in the former empire territories of Romania and Serbia today. Comparing the number of foreign investment projects in cities on either side of the long-gone Habsburg border, I find a higher number of investments, originating from countries that were also historically affiliated with the Habsburg empire, in former empire territories. I argue that this difference in investment along the former empire border can be attributed to persistent cultural ties formed through historic business relationships. The Habsburg empire made several important contributions to the development of the eastern

portions of the empire. Perhaps the most important contributions they made were in the development of infrastructure and industry which I argue led to the development of a historical business relationship that persisted over time.

Using a geographic regression discontinuity design, I present evidence of a sharp increase in the number of Habsburg investments along the former empire border. Specifically, I find an increase of 0.24 to 0.32 additional Habsburg investments per 10,000 individuals in former empire territories. This study provides a unique setting in which to examine the impact of cultural ties since the former Habsburg empire had a border which ran through several present-day countries, including Romania and Serbia. This feature allows me to measure the effect of within country variation in culture on FDI. Since cities on either side of the border have shared formal institutions for over 100 years, this methodology allows me to separate a cultural impact of empire affiliation on FDI that cannot be explained by differing institutions. Through the analysis, I present evidence that the number of investment projects from the rest of the world do not change across this border indicating that the former empire territories of Romania and Serbia are not simply offering better business environments for foreign investors. In examining other demographic and industrial characteristics of the regions in the analysis, I find only a few discontinuities in the industrial composition of the territories. These discontinuities are in manufacturing and agricultural employment. The former empire territories have stronger manufacturing sectors and lower agricultural employment today. However, it is unlikely that the industrial composition is driving the main results. The top industries of investment for Habsburg investors are service industries, primarily real estate and financial services. As investors from the rest of the world are also primarily investing in

services, industrial composition alone cannot explain the results of the model. While Romania and Serbia still have large populations of Hungarians throughout the former empire territories, the effect found is not attributed to Hungarian investors locating in Hungarian communities. The main results of the model are robust to the exclusion of the Hungarian group. In fact, I find no discontinuity across the former empire border for Hungarian investors. Rather, I present evidence of Hungarian investment increasing in the former empire territory and increasing in distance, suggesting that Hungarian investors are locating in areas that contain more Hungarians and in areas that are most likely closer to the border with Hungary. Furthermore, I show that a discontinuity still exists when considering only Austrian investors. This is in line with the main hypothesis of the model, since Austrians were most likely to develop the strongest cultural business ties in the area. The main findings of the model are robust to various specifications of the model including using various bandwidths and border fixed effects. Even more compelling, the results are robust to a falsification test using placebo borders located in 25-kilometer increments from the true border. In this test, only the true border provides statistically significant results for the estimate of the increase in Habsburg investment projects at the former empire border.

It is widely recognized in both the economics and international business literature that culture can impact the allocation of FDI. Culture can not only impact the location choice of a foreign investor, but it can also impact the long-term profitability of the foreign firm in the new country. While these implications are presumed, it has been difficult to formally test these assumptions since culture is inherently difficult to measure. Previous research attempts to measure culture through institutions, language, religion, or

the Hofstede index, however, these characteristics are typically measured at the country level, making it difficult to disentangle the effect found from any other characteristic that also varies at the national level. By measuring culture through a historic empire affiliation, I provide evidence of the impact that cultural ties can have on FDI that is separate from other factors.

Table 2.1: Empire Effect on Empire Investments for Selected Cities

$FDI_{Habsburg_i}$	Polynomial Models			Local Linear
	2nd Order	3rd Order	4th Order	
Estimate	1.298**	1.443*	1.327*	1.490*
Std. Error	0.647	0.866	0.746	0.858
Observations	326	326	326	130
Bandwidth				59.66

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1. Columns 1-3 present the estimates of the discontinuity in Habsburg investments at the former empire border using various orders of polynomials in distance from the border as controls. Column 4 uses a local linear approximation with an optimal bandwidth of 59.66 kilometers. Country fixed effects and robust standard errors are used in every estimation. These estimations feature only the cities that were selected for foreign investment. The analysis excludes Belgrade and five other surrounding cities.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table 2.2: Empire Effect on Empire Investments

$FDI_{Habsburg_i}$	Polynomial Models			Local Linear
	2nd Order	3rd Order	4th Order	
Estimate	0.242**	0.311**	0.326**	0.277**
Std. Error	0.107	0.145	0.144	0.118
Observations	3175	3175	3175	1689
AIC	6403.268	6405.838	6405.425	
Bandwidth				84.84

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1. Columns 1-3 present the estimates of the discontinuity in Habsburg investments at the former empire border using various orders of polynomials in distance from the border as controls. Column 4 uses a local linear approximation with an optimal bandwidth of 84.84 kilometers. Country fixed effects and robust standard errors are used in every estimation. The analysis excludes Belgrade and five other surrounding cities.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table 2.3: Polynomial Models over Various Bandwidths

	2nd Order Polynomial				
$FDI_{Habsburg_i}$					
Bandwidth	Full Sample	126 km	Optimal	56 km	42 km
Estimate	0.242**	0.309**	0.327**	0.300**	0.075
Std. Error	0.107	0.142	0.151	0.135	0.105
Observations	3175	2389	1698	1111	795

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1 using various bandwidths. A second order polynomial in distance and country fixed effects are used as controls in the estimation. Robust standard errors are used in every estimation. This analysis excludes Belgrade and five other surrounding cities.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table 2.4: Local Linear Models over Various Bandwidths

	Local Linear				
$FDI_{Habsburg_i}$					
Bandwidth	Full Sample	126 km	Optimal	56 km	42 km
Estimate	0.154**	0.220**	0.277**	0.313**	0.376**
Std. Error	0.060	0.091	0.118	0.149	0.174
Observations	3175	2389	1698	1111	795

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1 using various bandwidths. These estimates are based on a local linear approximation with country fixed effects as controls. Robust standard errors are used in every estimation. This analysis excludes Belgrade and five other surrounding cities.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table 2.5: Empire Effect on Austrian Investments

$FDI_{Austria_i}$	Polynomial Models			Local Linear
	2nd Order	3rd Order	4th Order	
Estimate	0.0978**	0.077	0.060	0.090**
Std. Error	0.045	0.055	0.056	0.043
Observations	3173	3173	3173	1049
AIC	5679.777	5683.541	5683.288	
Bandwidth				53.54

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Austrian investments per 10,000 individuals. Each column represents a different estimation of equation 1. Columns 1-3 present the estimates of the discontinuity in Austrian investments at the former empire border using various orders of polynomials in distance from the border as controls. Column 4 uses a local linear approximation with an optimal bandwidth of 53.54 kilometers. Country fixed effects and robust standard errors are used in every estimation. This analysis excludes Belgrade and five other surrounding cities.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table 2.6: Robustness Check for Empire Effect on Empire Investment

$FDI_{Habsburg_i}$	Polynomial Models			Local Linear
	2nd Order	3rd Order	4th Order	
Estimate	0.241**	0.313**	0.325**	0.283**
Std. Error	0.108	0.142	0.146	0.121
Observations	3172	3172	3172	1687
AIC	6380.4	6382.749	6382.282	
Bandwidth				84.84

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1. Columns 1-3 present the estimates of the discontinuity in Habsburg investments at the former empire border using various orders of polynomials in distance from the border as controls. Column 4 uses a local linear approximation with an optimal bandwidth of 84.84 kilometers. Country fixed effects, border fixed effects, and robust standard errors are used in every estimation. This analysis excludes Belgrade and five other surrounding cities.

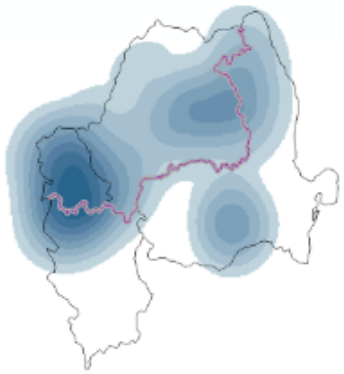
[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table 2.7: Empire Effect on Empire Investments using Placebo Borders

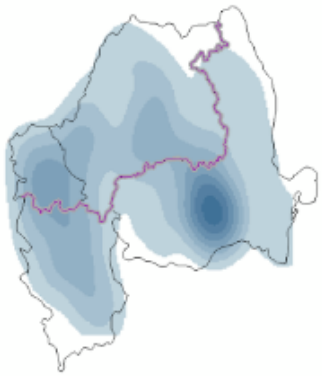
Cutoff	Optimal Bandwidth	RD Estimator	p-value	CI		Obs. Left	Obs. Right
100	38.25	-0.031	0.517	[-0.126,	0.063]	716	2458
75	38.74	0.027	0.307	[-0.024,	0.077]	996	2178
50	42.40	0.034	0.423	[-0.049,	0.116]	1324	1850
25	40.23	-0.026	0.114	[-0.058,	0.006]	1704	1470
0	84.86	0.282	0.02	[0.044,	0.519]	1899	1275
-25	68.92	-0.272	0.142	[-0.634,	0.091]	2112	1062
-50	59.88	-0.066	0.444	[-0.233,	0.103]	2305	868
-75	46.81	0.082	0.29	[-0.07,	0.235]	2501	672
-100	39.5	-0.333	0.139	[-0.774,	0.108]	2700	473

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals using a local linear approximation. These estimates come from separate estimations of equation 1, using a series of false borders that are located in 25 kilometer increments from the true border, which occurs at c = 0. Only the true border provides an estimate that is statistically significant. This analysis excludes Belgrade and five other surrounding cities.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

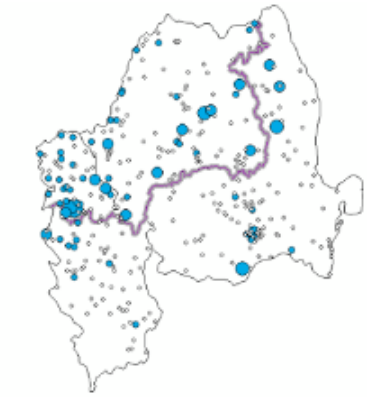


(a) Empire FDI

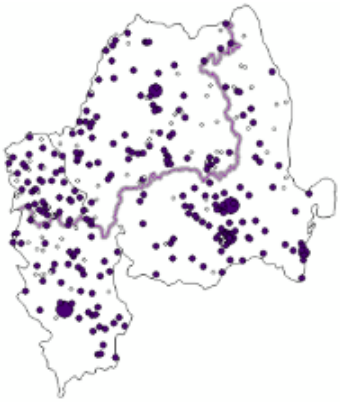


(b) ROW FDI

Figure 2.1: Density of FDI Projects

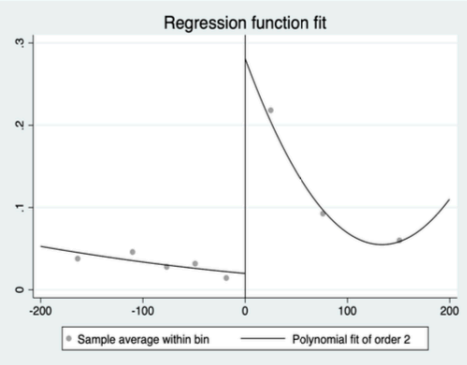


(a) Empire FDI per 10,000

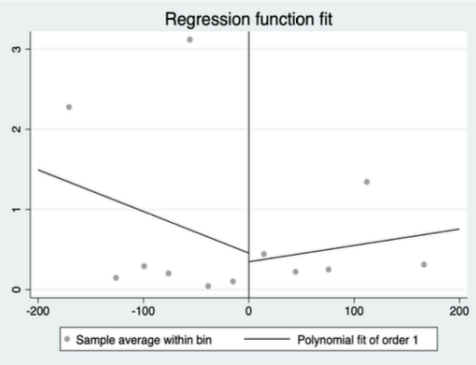


(b) ROW FDI per 10,000

Figure 2.2: Location of FDI Projects



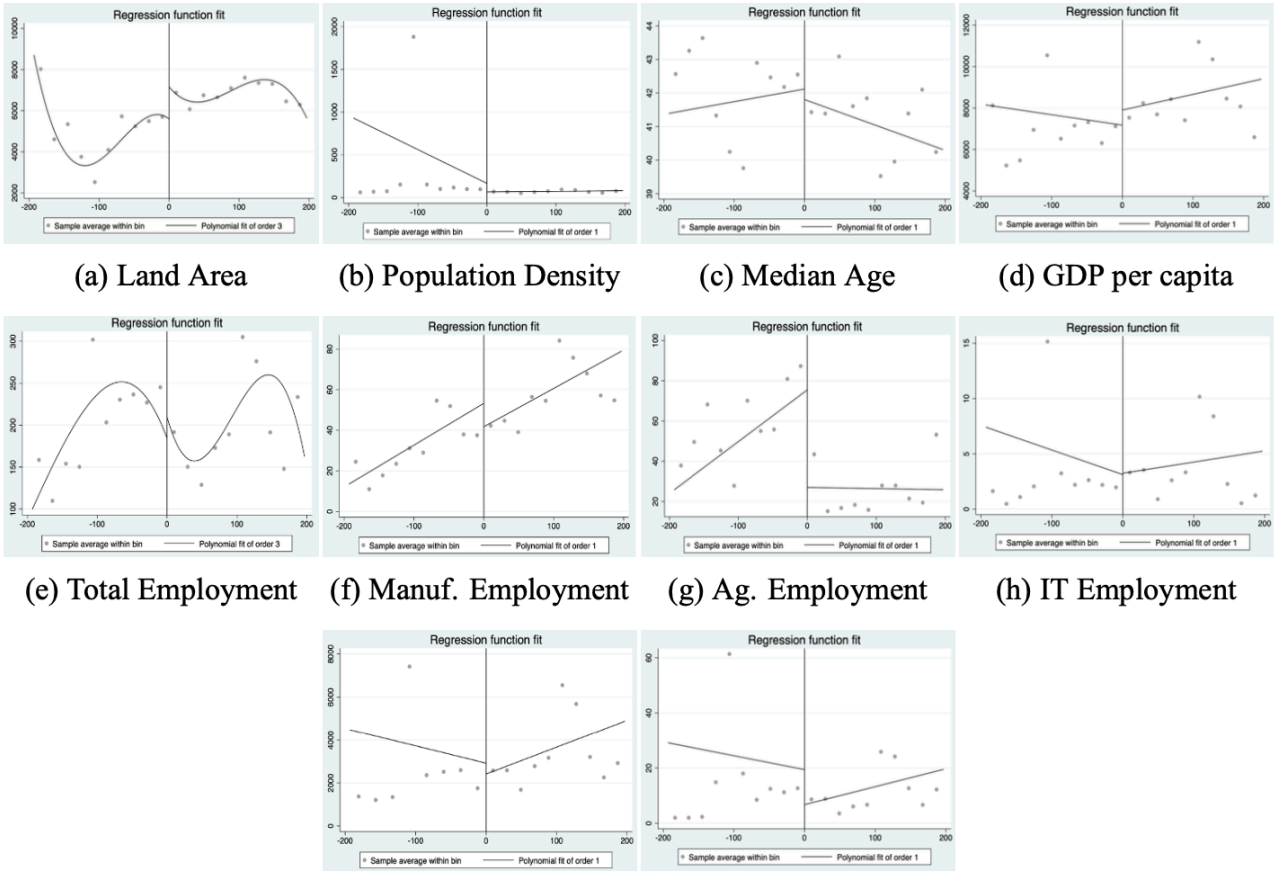
(a) Average Empire FDI per 10,000



(b) Average ROW FDI per 10,000

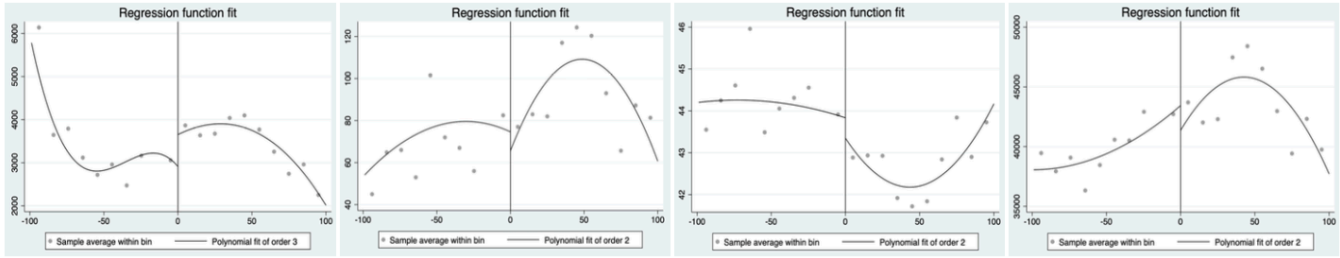
Note: These figures portray how FDI varies across the former empire border. The vertical axis denotes the average value of FDI projects per 10,000 individuals, while the horizontal axis denotes the distance in kilometers from the border. Negative values represent the distance to the border from cities that were never in the former empire, while positive values represent the distance to the border from cities that were located in the former empire territory.

Figure 2.3: Discontinuity in Number of FDI projects at the Empire Border

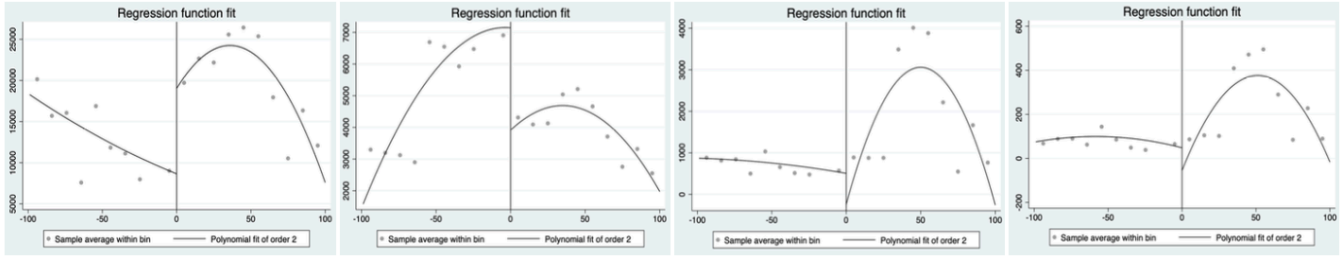


Note: These figures portray how regional and economic characteristics in Romania vary across the former empire border. The vertical axis denotes the average value for a given variable, while the horizontal axis denotes the distance in kilometers from the border. Negative values represent the distance to the border from cities that were never in the former empire, while positive values represent the distance to the border from cities that were located in the former empire territory.

Figure 2.4: Regional Characteristics of Romania (NUTS3)



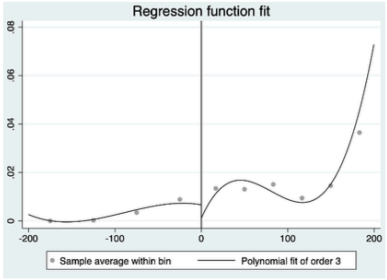
(a) Land Area (b) Population Density (c) Average Age (d) Average Wage



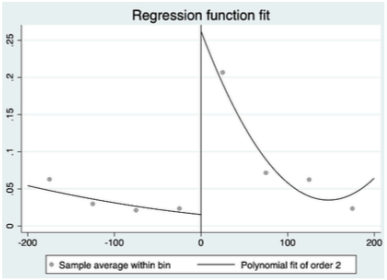
(e) Manuf. Workers (f) Ag. Workers (g) Finance and Insurance (h) Real Estate

Note: These figures portray how regional and economic characteristics in Serbia vary across the former empire border. The vertical axis denotes the average value for a given variable, while the horizontal axis denotes the distance in kilometers from the border. Negative values represent the distance to the border from cities that were never in the former empire, while positive values represent the distance to the border from cities that were located in the former empire territory. Belgrade and five surrounding cities are excluded from this analysis.

Figure 2.5: Regional Characteristics of Serbia (District)



(a) Average Hungarian FDI per 10,000



(b) Average Empire FDI excluding Hungarians

Note: These figures portray how FDI varies across the former empire border. The vertical axis denotes the average value of FDI projects per 10,000 individuals, while the horizontal axis denotes the distance in kilometers from the border. Negative values represent the distance to the border from cities that were never in the former empire, while positive values represent the distance to the border from cities that were located in the former empire territory.

Figure 2.6: Discontinuity in the number of FDI projects at the Empire Border (Hungarian case)

CHAPTER 3

THE KIA EFFECT: THE IMPACT OF FDI IN RURAL AMERICA

Section 3.1: Introduction

Rural U.S. counties have long lagged behind their urban counterparts. Rural areas are on average much less educated and have higher unemployment and poverty rates. The areas have different industrial compositions (USDA, 2020). The economic growth that rural areas experience is highly dependent on their industrial compositions. In general, these areas rely on agriculture, mining and fracking, and manufacturing. When these industries are affected by economic fluctuations, the residents' incomes and employment fluctuate as well. Over time many rural areas have experienced declining population rates. Many counties have older populations and are experiencing brain drain with the youngest, most educated residents migrating to urbanized areas for better opportunities (Kopparam, 2020). Economists often credit the rural-urban divide to agglomeration effects. Urban areas typically experience stronger growth because they have access to better infrastructure, including airports, highways, and public transportation, as well as a large pool of consumers and highly educated workers. These factors work together to raise productivity. Urban agglomeration advantages allow them to recover faster after recessions. Recent data show, however, that some rural areas had still not recovered from the 2008 recession when the COVID pandemic hit in 2020 (Ajilore and Willingham, 2020).

Many federal and local development programs target rural areas in an attempt to address the urban-rural development gap. Federal programs aimed at assisting rural areas have had varying levels of success. An alternative to federal funding at the state and local level is to focus business development on the attraction of foreign direct investment (FDI). Local communities around the United States compete vigorously to obtain foreign direct investment projects with the hope that once a new business establishes its operations, economic development will soon follow.

While foreign firms are typically much less likely to select rural areas, it is important to understand what happens to these local economies when they do. The purpose of this paper is to assess the extent to which FDI projects may have an impact on rural economic development. According to data obtained from *fDi Markets*, rural counties only attract a small share of FDI. Only 7 percent of all investment projects locate in rural areas. Even so, the average capital investment value of FDI projects in rural areas is 64.5 million dollars, which is 89 percent higher than the average amount of FDI going to urban areas. The average number of jobs created by foreign investors in rural areas is also higher. Rural areas receive an average of 108 jobs per project while urban areas receive 86. It should also be noted that rural areas in southern states attract more FDI than other parts of the country. The investment is primarily concentrated in manufacturing, with the automotive sector accounting ofr the largest number of projects (SelectUSA, 2018).

Given that many state and local governments use tax and other incentives to attract FDI, an analysis of the local economic effects is warranted to help understand whether such investments pay off in the long run. Yet, analyzing the effects of the

investments presents challenges. While it is possible to observe economic growth following an investment, it is difficult to determine how much of that would have occurred without the investment (O'Keefe, 2004, Pender and Reeder, 2011). Some areas may have experienced faster growth regardless of the investment received. Since the investment itself is not random, this makes estimating such an effect even more difficult. In this paper, I use a quasi-experimental approach in which treatment areas are matched to control areas that are similar in observed pretreatment characteristics that are believed to affect both the probability of treatment and the outcomes examined. This method of carefully matching treatment and control groups mimics a randomized experiment as closely as possible. As long as a suitable match can be found, this method has the capability of producing a valid estimate of the investment impact (Pender and Reeder, 2011).

Combined with propensity score matching, results from a difference-in-difference estimation shows no measurable effect of foreign direct investment on per capita personal income or employment growth in rural counties. The analysis reveals that rural counties receiving FDI are already growing faster than rural counties without such investments. The new investments do not appear to further influence these effects.

When examining the effect of FDI in one specific county, the results reveal a similar pattern. Troup County, Georgia received one of the largest investments when Kia established its operations in 2006. From a site location perspective, the choice was unusual. Troup County had few supply chain linkages for such a large investor. As a requirement to establish operations, the deal included provisions for several suppliers to also establish their operations in the area. In comparison to its closest match of St. Joseph

County, Michigan, the impact study reveals that Troup experienced employment growth and nonfarm personal income growth. However, there are no such effects for per capita personal income growth. In fact, St. Joseph County experienced faster per capita income growth from 2006-2018 without foreign direct investment projects. Part of the reason for this growth could be because St. Joseph County had greater linkages with urbanized areas as well as a higher share of manufacturing activity. These agglomeration factors may have allowed the county to sustain its economic growth over time.

This paper is among the first to analyze the effects of FDI in the United States at the county level. By combining propensity score matching with a difference-in-difference approach, I am able to ensure the model relies on a proper control group to provide reliable estimates. The case study, examining the impact of the Kia investment in Georgia, further supports the evaluation of FDI in rural counties. The analysis shows that a simple or narrowly focused development strategy for all rural areas does not raise economic growth. Rural development strategy must take into account the underlying economic characteristics of each area. State and local investment programs should target and support the existing industrial clusters, not just seek to attract new projects, whether through FDI or domestic investment.

This paper is organized as follows. Section 3.2 places this work in the context of the growth and impact analysis literature. Section 3.3 describes the data, while Section 3.4 introduces the methodology. Section 3.5 presents the results from the propensity score match and the difference in difference analysis. Section 3.6 presents the results from a quasi-experimental approach used to analyze the impact of the Kia investment in Troup County. Section 3.7 takes these results one step further by implementing an

IMPLAN analysis to assess the impact of the investment in the local community. This section also considers the impact that the Kia investment may have incurred if it located in St. Joseph County, Michigan. Finally, Section 3.8 concludes.

Section 3.2: Literature Review

Communities around the world often target FDI for its welfare enhancing capabilities. These perceived benefits include the adoption of foreign best practices and technologies as well as linkages between foreign and domestic firms (Alfaro et al., 2006). While these beliefs are particularly strong among business leaders, the evidence on the growth enhancing effects of FDI is limited. The empirical literature finds mixed results for the effect of FDI on economic growth.

Many of the previous studies conducted consist of macro level analyses at the country level. These types of studies find positive and significant effects of FDI on economic growth for developed economies while finding weak or no effect for developing economies. Even when the growth enhancing effects are not limited to developed economies, the gains that developed economies realize are much larger than those of developing countries (Carbonell and Werner, 2018). The literature attributes this to a necessary link between human capital and the growth enhancing effects of FDI. Borensztein, De Gregorio, and Lee **(**1998) suggest that FDI enables growth through technology diffusion. Hermes and Lensink (2003) find that countries require a certain level of capital in order to take advantage of the benefits of FDI. They uncover that a positive effect can only be realized if domestic financial markets are sufficiently developed. Similarly, Carkovic and Levine (2005) find that the effect of FDI depends on the level of human capital, domestic financial markets, and the initial level of income of

the host economy. Among studies that find little to no effect of FDI in aggregate terms, the authors discover varying effects among countries by income levels. De Mello (1997) shows that FDI has a positive effect on OECD countries and a negative effect on non-OECD countries. Baiashvili and Gattini (2019) find that economic growth exhibits an inverted u-shape when countries are separated by income level. Low- and high-income countries experience little to no growth in response to FDI while middle income countries exhibit the most growth following foreign investment. Alvarado et al. (2017) find no effect of FDI on economic growth in the aggregate for Latin American countries. When separating countries by income level, they reveal that high-income countries experience the highest growth, while middle income countries experience insignificant growth. Low income countries experience negative effects of FDI on growth. Accordingly, it follows that the United States should benefit from FDI due to its highly industrialized nature and its highly educated workforce. To my knowledge, no previous study evaluates the effect of FDI on economic growth within the United States; especially analyzing the effect of FDI in rural areas. Thus, this paper will build upon the current literature to provide an understanding of these effects at the county level.

This paper is also related to a strand of literature that examines the effect of various rural development initiatives on economic growth. The seminal Isserman and Rephann (1995) paper provides a first attempt at empirically analyzing the effect of the Appalachian Regional Commission and its funding on promoting economic development. This planning commission was established in order to support the economic growth of the Appalachian region. The main contribution of the commission was the provision of funding for infrastructure, hospitals, and educational facilities. In this paper, the authors

compare Appalachian counties that received funding to their nearest twins; a group of control counties that are similar across various characteristics but never received funding. The authors find that Appalachian counties grew faster than their twins in all 20 variables that were tested. Specifically, they show that Appalachian counties grew 48 percent more in income, 5 percent more in population, and 17 percent more in per capita income.

More recent papers build on this empirical methodology and apply the approach to different programs. O'Keefe (2004**)** examines the impact of California's enterprise zone program on employment and wage growth at the census tract level. In the analysis, census tracts which receive the EZ designation are matched to non-EZ-census tracts using propensity score matching. Results suggest that EZ census tracts experience employment growth at a rate of 3 percent per year during the first six years following the designation; however, this result does not persist in later years, even becoming negative over time. The author attributes this to the limited nature of the program. EZ designations only last for 15 years with the potential of a 5-year extension, making it more attractive for employers earlier in the designation.

A recent paper by Pender and Reeder (2011) examines the effect of the Delta Regional Authority on rural development from 2002 to 2007. To evaluate the impact of the funding, the authors match economically distressed counties which receive DRA funding to similar rural counties in the region using propensity score matching. They combine this methodology with a difference-in-difference approach and find that per capita personal income, along with its components, grew more rapidly in DRA counties. Additionally, these impacts were higher in counties with higher funding levels. This paper draws on this methodology to assess how FDI has affected the growth trajectories

of rural areas in the United States. While FDI is not necessarily a rural development policy, FDI has often been promoted as an important focus of development efforts. Understanding the economic effects of FDI in local communities is an important step in determining the effectiveness of policies designed to attract FDI to rural areas.

Section 3.3: Data

The United States Department of Agriculture (USDA) classifies counties as either metropolitan or non-metropolitan for research purposes. One classification scheme that is often used is the Rural-Urban Continuum Code. This code builds upon the official metro and nonmetro designations determined by the Office of Management and Budget (OMB) by further separating counties into three levels of metro development and six levels of nonmetro development. All counties are ranked on a scale of one to nine, with scores of 1-3 representing urban counties and scores of 4-9 representing rural/nonmetro counties. These county codes are updated every ten years. I use the 2003 Rural-Urban Continuum Code to select my sample of rural counties, which includes all counties with scores of 4 or higher. Using the *fDi Markets* database, I identify all rural counties with at least one foreign investment project between 2005 and 2015 as a "treated" county. All other counties which receive foreign investments before or after this period are eliminated from the study. I then build a demographic and industry profile for all rural counties in order to match each treated rural county with a proper control county for the study period.

In order to find a proper match for each county, I employ a propensity score matching model. The propensity score is the conditional probability that a given rural county will receive FDI, given the industry and demographic profile of each rural county in the year 2000. The probability that a county will receive FDI is modeled as a function

of these characteristics using a logit regression (O'Keefe, 2004). The logit model estimates the probability of each county ever receiving FDI and it takes the following form:

$$\Pr(EverFDI = 1) = \frac{e^{\beta' x}}{1 + e^{\beta' x}}$$

$EverFDI = 1$ if the county received any investment projects between the years 2005-2015, and it is zero otherwise. The selection of an area by a foreign investor depends directly on the needs of each investor as well as the industrial and demographic profile of each county. *X* is a matrix of these characteristics. Based on a review of the literature, I consider the following factors important determinants of foreign multinational location choices:

- population in the year 2000 (USDA)
- unemployment rate in the year 2000 (USDA)
- poverty rate in the year 2000 (Census Data)
- percent of the population commuting to a nearby county in the year 2003 (USDA)
- share of workers employed in the manufacturing industry in the year 2000 (QCEW- BLS)
- total count of all establishments in the year 2000 (QCEW- BLS)
- share of the Black and Asian populations in the year 2000
- share of the population between the ages of 25-50 in the year 2000

Each "treated" rural county is then matched to a "control" rural county with the closest propensity score, using a variety of matching methods to ensure common support (Pender and Reeder, 2011). This model takes into account the actual characteristics of each rural county in order to estimate the probability of ever receiving FDI. While no county will have a "perfect" match, the propensity score estimates the probability that a county will receive FDI based on the characteristics of counties that actually receive investment projects. Table 3.1 presents the results for the logit regression. Additional data

for the dependent variables, personal income per capita and total employment, come from the BEA.

Table 3.1 depicts how rural counties compare for the characteristics that are considered in the analysis. The counties eventually experiencing FDI are relatively more urbanized. They have higher populations, lower unemployment rates, and lower poverty rates. Additionally, these counties contain a higher count of establishments and of those establishments, a higher share of manufacturing establishments. It is also evident that these counties may be economically linked to more urban areas. This is revealed through a higher percentage of commuters. Demographically, treatment counties have larger Black and Asian populations. In comparing the means of treated and control counties it is evident that treatment counties are inherently different from control counties. Furthermore, it appears that treatment counties were already on different growth trajectories. The differences in the means across these groups are statistically significant. This validates the need to use propensity score matching in the model. Without such a model, the estimates would be biased upwards.

Table 3.2 depicts how matched pairs compare among the same group of characteristics. Once the propensity score matching model is employed, the treatment and control counties within propensity score blocks are balanced across the characteristics considered. The differences between the means of the treatment and control groups in the matched sample are no longer statistically significant.

Section 3.4: Methodology

In order to evaluate the economic effects of FDI in rural communities, I combine propensity score matching with a difference-in-difference model to estimate the impact of FDI on personal income and employment growth. The difference-in-difference approach addresses the issue of unobserved confounders by subtracting the initial mean differences in treatment and control groups. By combining this approach with propensity score matching to identify the control group, I can be sure that the treatment and control groups had similar trends prior to any foreign investment (Pender and Reeder, 2011). This model will test the effect of FDI on personal income growth from 2003 to 2018. The regression takes the following form:

$$\ln(\text{personal income}_\text{i})_\text{t} = \alpha + \beta EverFDI_i + \delta(PostEverFDI)_{it} + \alpha_j + \tau_t + \gamma_s + \varepsilon_{ist}$$

The dependent variable is the log of personal income in county *i* at time *t*. The variable $EverFDI$ is a dummy variable that is equal to 1 if a county ever receives FDI during the time period of the analysis and is zero otherwise. The coefficient, δ, on the variable $PostEverFDI_{it}$ is the coefficient of interest. This is the difference in difference estimator which is only equal to 1 for counties that have received FDI in time periods after the investment occurred. α_j are matched-pair fixed effects and τ_t and γ_s represent time and state fixed effects respectively. I also use this model to test the effect of FDI on employment, replacing the dependent variable with the log of total county employment.

Section 3.5: Results from the Difference-In-Difference Estimation

Table 3.3 details the logit estimation results from the propensity score matching model. All variables included in the model have the expected signs and most are statistically significant at the 95 percent confidence level or higher. While I only consider the determinants of foreign investment in rural counties, it is likely that less rural counties, or counties that are economically linked to more urbanized areas, will be more likely to attract foreign investment projects. For these reasons, measures relating to population size and a higher percentage of workers that are commuting to nearby counties should increase the probability of investment. Rural areas with higher poverty and unemployment rates most likely offer worse business services, infrastructure, and lower education levels. As expected, these factors all negatively affect the probability of investment. Measures capturing industrial agglomeration, such as the total count of establishments should be positive factors in the location decision. As most of the investment projects locating in rural areas are within manufacturing, the share of manufacturing establishments in an area should increase the probability of investment.

The estimated probability of receiving FDI for each county is calculated from the logit coefficients. Next, each treated rural county is matched to a control county with the nearest propensity score. These county matches are then used in the difference-in-difference analysis.

The results from the difference-in-difference approach are presented in Table 3.4. The analysis reveals that rural areas do not seem to significantly benefit from FDI. Under both the per capita personal income and the employment specifications, the coefficient on the treatment variable is positive and statistically significant. This indicates that rural

counties receiving foreign direct investment projects experience faster personal income and employment growth than rural counties without such projects. Nevertheless, based on the results obtained from the analysis, it is not evident that this growth can be directly attributed to FDI. The coefficient on the difference-in-difference estimator is close to zero in both specifications. FDI has no additional impact on these regions after the investments occurred. These findings are in line with previous research that finds a need for areas to have absorptive capacity in order to benefit from FDI. In order for an area to be able to benefit from FDI, it needs to have a certain threshold of human capital and financial market development to experience compounding growth effects (Carbonell and Werner, 2018). While FDI appears to be going to more developed rural areas with better economic linkages, these areas may not be developed enough to benefit fully from the investment. It is more likely that urban areas with higher industry agglomeration would see larger gains from FDI. The next section explores this conjecture in further detail through a case study analysis on Troup County, Georgia.

Section 3.6: Case Study: The Kia Effect

In 2006, Troup County, Georgia experienced one of the largest foreign direct investments of any rural area when Kia Motors decided to establish its operations in the county. This investment included a one-billion-dollar assembly plant which would provide approximately 2,500 jobs. In addition, Kia also expected several suppliers to establish their operations in the area in the following years. These subsequent projects represented an additional 3,600 jobs and an additional 830 million-dollar investment in the region. From a site selection perspective, this move was unexpected. Troup County did not have the necessary infrastructure and supply chain linkages, as evidenced by the

deal requirements, that other areas could offer. The only benefit of the area was that it was located near a major highway and in close proximity to the Hyundai plant in Montgomery, Alabama. Regarding state and local incentives, the automaker requested site preparation assistance, workforce training, tax incentives, and proof that the plant would be welcomed by the local community. Georgia spent 48.5 million dollars on site preparation, 81 million dollars on road improvements, and also built a 14.5 million-dollar training facility which would be managed by the QuickStart program. In addition to these incentives, Troup County also offered the automaker 130 million dollars in property tax abatements which would gradually dissipate over a 16-year period as well as an additional 21 million dollars towards infrastructure development. Over time, the Kia suppliers established their operations, and several other major suppliers also located in the area. These include Hyundai-Mobis, Dongwon Autopart Technology, Sejong Georgia LLC, Sewon America, Daehan Solution, Johnson Controls, Glovis, Powertech America and Kumho Tire. Locals were excited about the new plant and expected a housing boom and a revitalization of the area with new families locating in close proximity to the auto plant. While a few new businesses have since emerged, the "boom" has been smaller than expected and county unemployment remains high. As with all large business deals, there are also some concerns regarding the tax concessions and whether the economic benefits of the investment outweigh the costs (Maister, 2011).

In this part of the analysis, I aim to shed some light on the impact of the Kia investment. In order to do this, I use the propensity score obtained in the first stage of the analysis in order to identify the best match for Troup County. This match is then used to identify the impact of the investment on personal income and employment growth. Based

on the propensity score matching model outlined in Section 3.4, I determined that the best matches for Troup County are St. Joseph County, Michigan and St. Landry Parish, Louisiana.

Before turning to the results of the analysis, it is important to understand how Troup differs from other counties and how it compares with its closest matches. Table 3.5 details the characteristics on which the matches were made. Relative to all other rural counties that received FDI during the period of the study, Troup county has a slightly higher population. Moreover, the population is also relatively younger. Firms benefit from having access to large young population. Other attractions of this county include a lower unemployment rate, a higher share of manufacturing establishments as well as a higher total count of establishments. It is also interesting to note that the percentage of commuters is much lower than in other rural counties. This indicates that Troup County is not as economically integrated with more urbanized areas as are other rural counties. Based on the estimated propensity scores, St. Joseph County, Michigan is the closest match for Troup County, Georgia. Relative to St. Joseph County, Troup had a higher poverty rate and a lower share of manufacturing establishments. Additionally, the percentage of commuters was much lower, indicating that Troup was not as economically integrated to urbanized areas as it's match.

Estimating the local impact of a policy or event is often done using a series of shift-share analyses (Feser, 2013). In a shift-share approach, the level of the economic activity of interest before the treatment is subtracted from the level of the economic activity of interest after the treatment. The economic activity of interest before the treatment is adjusted by a nationally representative "share" of the growth rate of the

economic activity of interest. Following Isserman and Merrifield (1982), rather than using the "national share" of the growth rate, the growth rate of the control group is used. Under this model, the total impact, *I*, of the Kia investment in Troup County at time *t*, takes the following form:

$$I_i^t = E_i^t - r_c^{0t} E_i^0$$

Where E_i^t represents income or employment in Troup County at time t. Similarly, E_i^0 represents the income or employment in Troup County in year 0 (2005), the year in which the investment occurred. The variable r_c^{0t} represents the growth rate in each of the economic activities of interest in the control counties from year 0 to year *t*. I perform this analysis from 2006-2018. The results from the impact analysis are detailed in Tables 3.6 and 3.7.

In this shift-share analysis, I consider four different measures of economic growth. These are per capita personal income, nonfarm personal income, total employment, and nonfarm employment. The analysis reveals that Troup County does not experience per-capita personal income growth following the Kia investment. While St. Joseph County did not receive any foreign investment during this time, it still experienced a faster per capita personal income growth rate. This could be due to the more industrialized nature of the county. As previously noted, St. Joseph has a higher share of commuters and a higher share of manufacturing activity. These characteristics may have allowed the county to experience stronger personal income growth over time. In all other measures examined, Troup County outpaces St. Joseph county in the years following the Kia Investment. The same analysis is repeated with the next closest county match, St. Landry Parish, Louisiana. Similar trends are obtained from this analysis. Troup

County experiences negative growth in per capita personal income from 2006-2018. In this specification, Troup County also experiences negative growth from 2006-2010 in nonfarm personal income, total employment, and nonfarm employment, which could be attributed to the recession during these years. It could also be argued that it takes time to see the effects of an investment as large as the Kia plant. While the investment occurred in 2006, the first car was not produced 2009. It is plausible that the county would not reap the full benefits of the investment until 2011 or later as the results indicate. Troup County begins experiencing growth in 2011 across nonfarm personal income, total employment, and nonfarm employment; however, the growth experienced is not as significant as the growth estimates obtained when using St. Joseph county as the control county. These results are given in Table 3.7.

The next section takes this analysis one step further by assessing the economic impact of the Kia investment using an input-output impact model (IMPLAN). Additionally, it estimates the hypothetical impact of the investment in St. Joseph County, a county with much stronger agglomeration networks. Based on the literature and the findings so far, it is anticipated that the effects would be stronger in such a community.

Section 3.7: Impact Analysis using IMPLAN

The final part of the analysis applies an input-output model using IMPLAN software to estimate the impact of the Kia investment on the local community. This inter-industry model has the advantage of providing a level of detail in the economic impact study which would otherwise not be possible to ascertain with other models. The software accounts for the inter-industry relationships within the local economy in great depth and the transactions among industries. The model takes into account 536 sectors,

using roughly 100 datasets. It accounts for non-disclosed industries and non-census survey years, to capture all market transactions in a given period. The model allows me to evaluate the total effect of the Kia investment based on the direct spending and employment emanating from the plant. I can then calculate the indirect effects, or the effects that can be attributed to industry purchases of inputs from other local industries. These are the intermediate expenditures of the industry being analyzed. Non-local purchases of intermediate inputs are also built into the model, but these are not considered as part of the county-level impacts.

Table 3.8 displays the results from the IMPLAN analysis. The model estimates that the Kia plant created 3,000 direct jobs in Troup County. Additionally, the plant supports an estimated 1,710 indirect jobs through its supplier network. Together, this represents a total of 4,710 jobs in the county tied to the Kia investment. The resulting Kia-related county employment multiplier is 1.57. This means that for every one job created at the Kia plant, approximately 0.6 additional jobs are supported through Troup county supplier relationships.

Beyond employment impacts, I examine the plant's gross (total) output and value added. The total output effect represents the annual value of Kia's operations. The total output of the Kia plant is approximately 3.65 billion dollars. It includes employee wages and benefits, equipment, building construction and overhead, technology services, spending on vendors, and other administrative costs at the county level. Kia's operations boost the demand for goods and services from other suppliers and businesses that are linked to their supply chain. To satisfy this increase in demand, these suppliers and vendors must also source additional materials which also contributes to Kia's overall

multiplier effect. These additional purchases could even affect sectors outside of the automotive industry. These additional purchases that are a result of Kia's increased demand, are the indirect effects from Kia's operations. Kia's estimated indirect output effect is 410 million dollars.

While the total output of the plant is valued at 3.65 billion dollars, the value added captured by the county is just 662,853,127. This means that most of what is assembled in the automotive plant draws on components and supplies from outside the county. The county's local content–the ratio of total output to value-added–is relatively low; approximately 20 percent.

In order to get a better understanding of the potential impacts of such a large investment, the employment impact is compared with St. Joseph County, Michigan, which had a larger population and lower poverty and unemployment rates in the year 2000. Table 3.9 displays the results for the economic impact that they Kia plant may have had if they had chosen to locate in St. Joseph County, Michigan. The results from the analysis are similar to those from Troup County. St. Joseph County Michigan does not have an automotive manufacturing assembly sector. Given a smaller local supplier base, the estimated indirect impacts are slightly smaller than the ones estimated for Troup County. For a plant that directly employs 3,000 workers in St. Joseph County, an additional 1,198 jobs would be created through local suppliers. This compares with 1,710 jobs supported through the local supply chain in Troup County.

In general, the impact of a large FDI project in a rural area is small relative to what it could be if a similar size plant would have located in a well-developed urban area. There is a relatively low multiplier effect and low value-added relative to the total output.

As a result of the Kia investment, Troup County does have a more developed supplier network than a county like St. Joseph. Even so, the indirect impact and the multiplier effects are small. Rural counties may not have the absorptive capacity necessary to take advantage of the gains from FDI. These effects are even smaller in a county with a less developed automotive sector. For the Kia investment, most of the impact of the investment is outside of the local area.

Section 3.8: Conclusion

This paper examines the consequences of FDI in rural counties in the United States. While rural counties have received much larger investments than urban counties, there is at best minimal evidence that these investments have aided in increasing economic development outcomes as captured by personal income and employment growth. In the first stage of the analysis I combine propensity score matching with a difference-in-difference approach to test the effect of FDI on personal income and employment growth. Rural counties with FDI projects are matched to rural counties that received no such investments based on characteristics that are deemed to influence both the probability of investment and personal income and employment growth. This analysis reveals that counties with FDI are experiencing faster personal income and employment growth, however, this effect is not directly attributed to the investments received.

These findings are in line with previous literature showing that areas must have absorptive capacity in order to benefit from FDI. As rural areas are less developed, they do not have the necessary linkages to take advantage of the gains from FDI. To further explore this claim, I examine the impact of a large investment in a rural county. In the second part of the paper, I examine the case of Troup County, Georgia which landed the

Kia investment in 2006. I compare the impact of the investment in Troup County to its closest matches using a quasi-experimental approach. This quasi-experimental approach demonstrates that Troup did not experience personal income growth following the Kia investment. In fact, the closest matches actually experienced faster personal income growth rates during this time. However, there is some evidence that Troup County experienced faster employment growth than both of its matches over the time period of the analysis. In the final part of the paper, I use an input-output model (IMPLAN software) to determine the impact of the Kia investment on Troup County. For comparison purposes, I also test the hypothetical impact of the investment in St. Joseph County. I find small multiplier and value-added effects of the Kia plant in Troup County and comparable but smaller effects for St. Joseph County, Michigan.

While FDI is frequently targeted for its perceived economic benefits, this paper finds minimal evidence that the impacts are substantial. It is possible that local and state governments would be advised to strengthen their existing supplier bases in addition to attracting new businesses as a development strategy. Future work should examine the extent to which these types of policies may better serve rural counties in the United States.

Table 3.1: Full Sample Descriptive Statistics, 2000

Variable	Treatment Mean (Std. Deviation)	Control Mean (Std. Deviation)	T-C
Ln Population 2000	10.3869 (0.7868)	9.3778 (0.9840)	1.0091
Unemployment	4.5975 (1.4934)	4.6301 (1.8159)	-0.0326
Poverty Rate	14.6352 (6.0983)	15.8668 (6.9126)	1.2316
Share Manufacturing	0.0630 (0.0311)	0.0446 (0.0359)	0.0184
Ln Total Count	6.5901 (0.8309)	5.6372 (0.9683)	0.9529
Percent Commute	11.6326 (11.8864)	6.5005 9.6705	5.1321
Share Black	0.1037 (0.1588)	0.0700 (0.1444)	0.0337
Share Asian	0.0053 (0.0050)	0.0035 (0.0042)	0.0018
Vitality	0.3432 (0.0243)	0.3315 (0.0305)	0.0117

Table 3.2: Matched Pair Descriptive Statistics, 2000

Variable	Treatment Mean (Std. Deviation)	Control Mean (Std. Deviation)	T-C
Ln Population 2000	10.3869 (0.7868)	10.1347 (0.8337)	0.2522
Unemployment	4.5975 (1.4934)	4.7125 (1.7115)	-0.115
Poverty Rate	14.6352 (6.0983)	15.0692 (6.6082)	-0.434
Share Manufacturing	0.0630 (0.0311)	0.0604 (0.0336)	0.0026
Ln Total Count	6.5901 (0.8309)	6.3421 (0.8774)	0.248
Percent Commute	11.6326 (11.8864)	10.1772 (11.7703)	1.4554
Share Black	0.1037 (0.1588)	0.1036 (0.1726)	0.0001
Share Asian	0.0053 (0.0050)	0.0049 (0.0060)	0.0004
Vitality	0.3432 (0.0243)	0.3385 (0.0262)	0.0047

Table 3.3: Logit Results: Propensity Score Matching

EverFDI	Coef. (Std. Error)	z	p >|z|	Confidence Interval
Ln Population 2000	1.0920*** (0.2750)	3.97	0	[0.5531, 1.6309]
Unemployment	-0.0509 (0.0507)	-1.00	0.315	[-0.1502, 0.0484]
Poverty Rate	-0.0152 (0.0163)	-0.94	0.349	[-0.0471, 0.0166]
Share Manufacturing	6.1297*** (2.1961)	2.79	0.005	[1.8255, 10.4339]
Ln Total Count	0.1492 (0.2523)	0.59	0.554	[-0.3453, 0.6437]
Percent Commute	0.0101 (0.0064)	1.6	0.11	[-0.0023, 0.0226]
Share Black	1.7116*** (0.4858)	3.52	0	[0.7595, 2.6637]
Share Asian	11.9959 (13.2297)	0.91	0.365	[-13.9338, 37.9257]
Vitality	2.9677 (2.3517)	1.26	0.207	[-1.6415, 7.5770]

[a] Note: This table presents estimates from a logit estimation where the dependent variable, everfdi, is an indicator variable equal to 1 if a rural county has ever received and FDI projects from 2005-2015.This estimation is used to derive the propensity score for each county, or the predicted probability of receiving foreign investment. Rural counties with FDI are then matched based on their propensity score to rural counties with no foreign investment projects over the selected time period.

[b] $p < 0.10$*, $p < 0.05$**, $p < 0.01$***

Table 3.4: Results from the Difference-in-Difference Analysis

Dependent Variable		Coef. (Std. Error)	t	p >|z|	Confidence Interval
Ln Per Capita Personal Income					
	EverFDI	0.0284*** (0.0133)	2.14	0.038	[0.0016, 0.0552]
	PostEverFDI	0.0001 (0.0067)	0.01	0.993	[-0.0134, 0.0135]
Ln Employment					
	EverFDI	0.1853*** (0.0818)	2.27	0.028	[0.0205, 0.3502]
	PostEverFDI	0.0017 (0.0101)	0.16	0.871	[-0.0187, 0.0221]

[a] Note: This table presents the results from a difference-in-difference estimation, controlling for state, time, and matched pair fixed effects. Standard errors are clustered at the state level. Only observations on common support were used in the estimation.

[b] $p < 0.10$*, $p < 0.05$**, $p < 0.01$***

Table 3.5: Case Study County Characteristics, 2000

Variable	Troup County, GA Mean	St. Joseph County, MI Mean	St. Landry Parish, LA Mean
Ln Population 2000	10.9815	11.0417	11.3817
Unemployment	3.6	3.4	6.5
Poverty Rate	14.8	11.3	29.3
Share Manufacturing	0.0877	0.1411	0.0360
Ln Total Count	7.2457	7.1892	7.3317
Percent Commute	8.7247	20.1526	24.9379
Share Black	0.3213	0.0262	0.4230
Share Asian	0.0059	0.0061	0.0020
Vitality	0.3569	0.3510	0.3291

Table 3.6: Impact Analysis using St. Joseph County as the Match

Year	PCPI	Nonfarm_PI	Total Employment	Nonfarm Employment
2006	-255.06	7,640.33	345	306
2007	-554.42	57,441.36	-164	-107
2008	-44.08	110,903.18	1,911	1,962
2009	-134.54	303,290.07	3,962	4,119
2010	-620.40	357,060.11	5,996	6,138
2011	-61.57	463,865.83	8,148	8,412
2012	-306.18	512,438.77	9,059	9,240
2013	-1,093.47	531,561.57	9,031	9,189
2014	-662.05	572,837.08	10,134	10,253
2015	-1,752.60	592,134.05	11,974	12,120
2016	-2,001.21	604,553.85	12,674	12,765
2017	-3,858.00	642,254.58	13,318	13,323
2018	-3,469.56	712,980.32	13,686	13,760

Table 3.7: Impact Analysis using St. Landry Parish as the Match

Year	PCPI	Nonfarm_PI	Total Employment	Nonfarm Employment
2006	-1,303.40	-41,829.12	-682	-690
2007	-2,911.30	-3,337.82	-1,189	-1,120
2008	-4,867.11	-24,232.65	-1,415	-1,334
2009	-5,674.46	14,792.36	-2,568	-2,428
2010	-6,336.26	93,126.15	-572	-433
2011	-5,956.69	218,995.08	1,609	1,719
2012	-6,938.96	207,827.74	3,188	3,260
2013	-8,184.77	279,604.83	4,397	4,398
2014	-8,564.56	272,995.49	5,744	5,731
2015	-7,716.91	408,576.18	7,357	7,453
2016	-6,319.87	497,674.10	8,574	8,628
2017	-6,700.85	530,237.50	8,567	8,671
2018	-7,258.84	559,312.42	8,681	8,793

Table 3.8: IMPLAN Results for Kia in Troup County

	Employment	Value Added	Output
Direct	3,000	$662,853,127	$3,651,881,981
Indirect	1,710	$151,119,698	$410,420,725
Total	4,710	$813,972,825	$4,062,302,706

Table 3.9: IMPLAN Results for Kia in St. Joseph County

	Employment	Value Added	Output
Direct	3,000	$662,853,127	$3,651,881,981
Indirect	1,198	$96,927,860	$248,824,001
Total	4,198	$759,780,987	$3,900,705,982

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APPENDIX A

ADDITIONAL TABLES AND FIGURES

Table A.1: Empire Effect for All Selected Cities

$FDI_{Habsburg_i}$	Polynomial Models			Local Linear
	2nd Order	3rd Order	4th Order	
Estimate	1.152*	1.181	0.991	1.370*
Std. Error	0.628	0.768	0.627	0.767
Observations	330	330	330	114
AIC	1396.259	1400.243	1399.035	
Bandwidth				51.32

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1. Columns 1-3 present the estimates of the discontinuity in Habsburg investments at the former empire border using various orders of polynomials in distance from the border as controls. Column 4 uses a local linear approximation with an optimal bandwidth of 51.32 kilometers. Country fixed effects and robust standard errors are used in every estimation. This analysis includes only the cities that were selected for investment, apart from Belgrade.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table A.2: Empire Effect for All Cities

$FDI_{Habsburg_i}$	Polynomial Models			Local Linear
	2nd Order	3rd Order	4th Order	
Estimate	0.248**	0.275**	0.276**	0.277**
Std. Error	0.111	0.138	0.133	0.120
Observations	3180	3180	3180	3180
AIC	6403.268	6405.838	6405.425	
Bandwidth				84.21

[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1. Columns 1-3 present the estimates of the discontinuity in Habsburg investments at the former empire border using various orders of polynomials in distance from the border as controls. Column 4 uses a local linear approximation with an optimal bandwidth of 84.21 kilometers. Country fixed effects and robust standard errors are used in every estimation. This analysis includes all cities in the sample, apart from Belgrade.

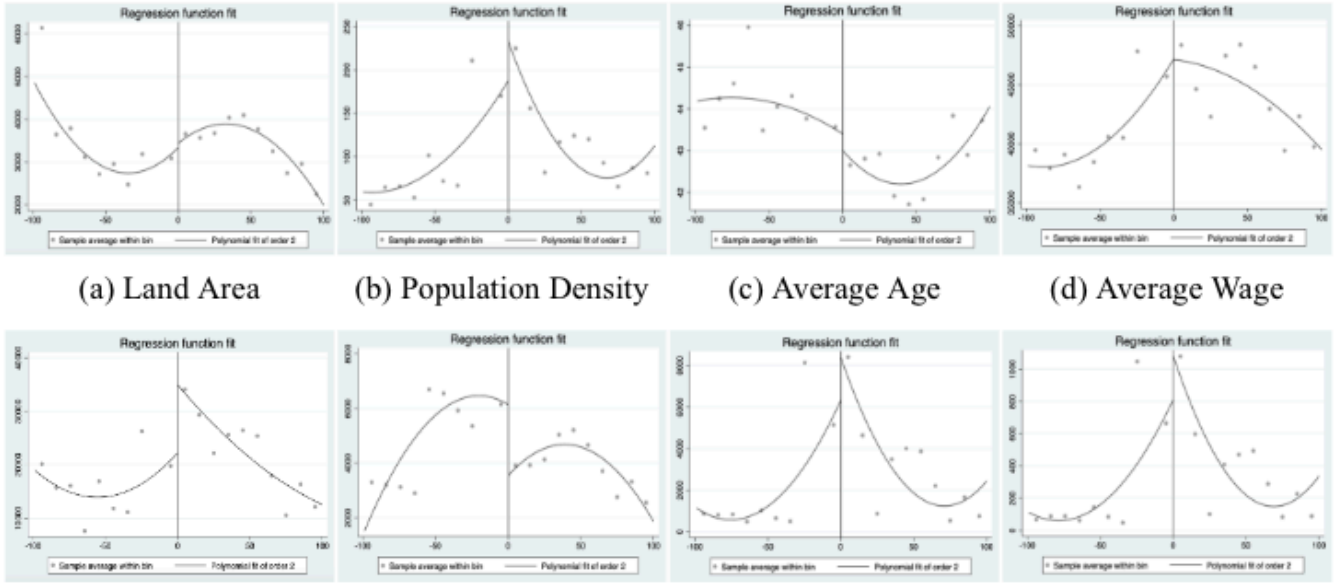
[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$

Table A.3: Effect on Empire Investments Excluding Hungary

$FDI_{Habsburg_i}$	Polynomial Models			Local Linear
	2nd Order	3rd Order	4th Order	
Estimate	0.236**	0.298**	0.327***	0.266**
Std. Error	0.106	0.144	0.143	0.115
Observations	3175	3175	3175	1700
AIC	6411.842	6414.77	6414.279	
Bandwidth				85.59

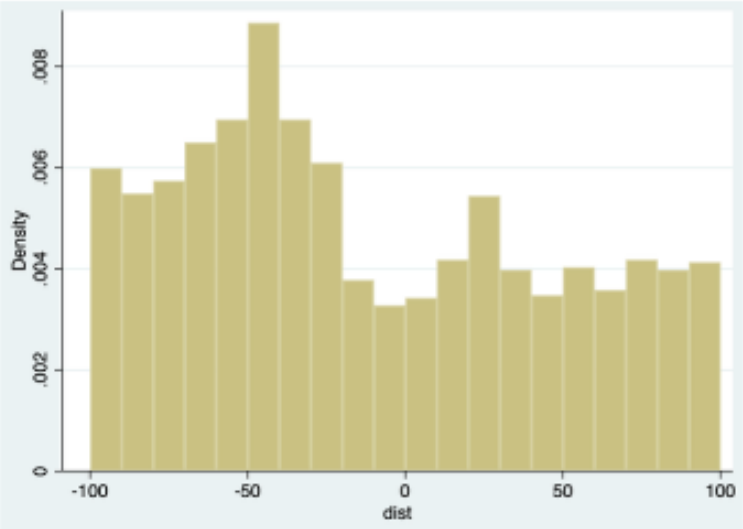
[a] Note: This table presents estimates of the effect of Habsburg empire affiliation on the number of Habsburg investments per 10,000 individuals. Each column represents a different estimation of equation 1. Columns 1-3 present the estimates of the discontinuity in Habsburg investments at the former empire border using various orders of polynomials in distance from the border as controls. Column 4 uses a local linear approximation with an optimal bandwidth of 85.59 kilometers. Country fixed effects and robust standard errors are used in every estimation. This analysis excludes Hungarian investors, the city of Belgrade, and 5 surrounding suburbs.

[b] $p < 0.10^{*}, p < 0.05^{**}, p < 0.01^{***}$



Note: These figures portray how regional and economic characteristics in Serbia vary across the former empire border. The vertical axis denotes the average value for a given variable, while the horizontal axis denotes the distance in kilometers from the border. Negative values represent the distance to the border from cities that were never in the former empire, while positive values represent the distance to the border from cities that were located in the former empire territory. Only Belgrade is excluded from this analysis.

Figure A.1 Regional Characteristics of Serbia (District)



Note: This figure examines the density of the forcing variable, distance to the border in kilometers from cities in the analysis. This figure serves to establish that investors are not sorting into the former empire territory. To verify that this is the case, there should be no evidence of a discontinuity in the number of cities at the border. While there are more cities in the non-empire territory, this figure presents evidence that there is no discontinuity in the number of cities at the former empire border, which occurs at a distance of 0.

Figure A.2: Density of the Forcing Variable