Location-Based Development Impact Fee Programs and New Business Location Decisions

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Abstract

Exploiting quasi-experimental variation in cross-border differences in rates over time, we explore the effects of development impact fees on business location decisions. While research investigating the causes and consequences of impact fee programs spans four decades, surprisingly little is known about how commercial and residential impact fee programs influence the spatial distribution of new businesses. Our results suggest school impact fees, which are paid by only residential developers, increase the level of new business establishments, local employment, and retail sales. These results are consistent across models using countywide measures and cross-border differences. For commercial impact fees, we find positive or insignificant effects in countywide estimations but negative effects near county borders highlighting the importance of using methods that properly control for local economic conditions to give cleanly identified causal estimates. The negative effect on commercial impact fees suggest enhanced provision of public infrastructure plays a critical role in offsetting the potentially negative effects of impact fees on economic activity. Our results highlight the value of public infrastructure to the business community as well as the potential for efficiency gains from regionally coordinated impact fee programs.

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Introduction

Local government officials make critical decisions concerning what taxes they will ask business to pay, how much those taxes will be, and how to spend tax revenues. The Tiebout Model (Tiebout, 1956) has consistently been used by scholars of local public finance to illustrate the governing dynamics that influence how mobile capital and labor 'sorts' across jurisdictions. While much of this literature focuses on residential sorting, a meaningful subset focuses on how local taxation/spending impacts the location decisions of businesses. For example, classic work by John Due (1961) found state and local taxes had little to no impact on the location of business activity – suggesting entrepreneurs were negatively affected by higher tax burdens to an extent roughly equal to the positive impact of higher quality local public services. This prompted a 'much ado about nothing' view of local taxes on businesses that thrived during the 1960s and 1970s. Under this view, local taxation – particularly local property taxes – would not necessarily deter local business investment, particularly if they were used to provide local services demanded by residents and businesses. However, other influential studies from the 1980s and 1990s supported the idea that higher taxes led to reduced levels of economic activity. For example, Bartik (1985) made a strong case for this view, as did his 1992 review piece synthesizing results from nearly 50 studies spanning the decade of the 1980s.

A theme from this diverse and often contentious literature is that *ceteris paribus*, businesses are deterred by higher taxes, but are simultaneously attracted by enhancements to the quality and/or quantity of local public services. Of course, using the terms *ceteris paribus* and simultaneously jointly in this context is purposefully paradoxical – as each nullifies the other. In a Tiebout-type equilibrium that is supported by competition among local governments, higher local taxes lead directly to enhanced levels of public services, whereas a desire to enhance the level of public services is paired with a requirement to raise more revenue. Much like shoppers in a grocery store, firms in a competitive Tiebout setting 'get what they pay for'. However, business location decisions in the real world face a number of complications that are not fully reflected in the classic Tiebout model, such that opportunities to learn about the costs and benefits of specific tax policies on business activities are abundant.

Understandably, most papers on the topic have focused on property taxes or sales taxes, two historically dominant sources of local revenue. However, knowledge regarding the effects of other revenue mechanisms on business location decisions is severely lacking. For example, development impact fee programs – to our knowledge at least – have never been investigated in terms of direct connections to business location decisions. This omission is surprising for at least three reasons. First, development impact fee programs represent one of the cleanest examples of a local revenue mechanism where the cost side (monetary fee) and benefit side (new infrastructure) of the budgetary process are closely linked. Since the 'rational nexus' test requires impact fee revenues be spent on infrastructure that demonstrably serves the facilities generating those revenues,

development impact fee programs can be accurately described as a "benefits tax" application – borrowing from the literature on the benefits view of the property tax (e.g., Oates, 1969; Zodrow and Mieszkowski, 1986; Fischel, 1992). Additionally, development impact fees represent a rapidly expanding source of local government revenue in the U.S., a particularly strong phenomenon in Florida, where our data come from (Burge and Ihlanfeldt, 2007; Burge, 2010). And finally, unlike many other local taxes, impact fees often change in sharp/discrete jumps that occur at jurisdictional boundaries. So for example, whereas crossing the border between Broward County Florida into Miami-Dade County moves the retail sales tax rate from 6% up to 7%, the same border transition – which represents a thriving area in terms of economic activity – shifts commercial impact fees to substantially higher levels, ranging from a 25-40 percent premium during our sample. At the same time, the Miami-Dade side of the border had significantly *lower* school impact fees. While this example represents only a single anecdote, our data contains a myriad of other similarly meaningful comparisons. This approach places our work within a rapidly developing literature that exploits quasi-experimental variation in tax policy conditions across local political borders (i.e., the idea that policy variation is paired with otherwise plausibly similar economic environments within arbitrarily close proximity to the border, forming a valid treatment/control counterfactual comparison).

To address this gap in the literature, we study how commercial developers and business entrepreneurs react to development impact fee programs. Specifically, we use 20 years of county-level panel data from Florida, pairing a unique hand-collected database on commercial and residential impact fees with detailed business establishment-level data from Infogroup's Historical Business Database.[1] We estimate two-way fixed-effects countywide models that illustrate how businesses react to changes in impact fee rates associated with the overall/average costs and benefits of programs within the county over time, as well as GIS facilitated quasi-experimental border approach that more precisely identify the effects of the monetary costs of impact fees. Taken collectively, our results suggest that impact fees reduce business activity, employment levels, and retail sales near county borders, where the choice to locate in lower-impact fee environments comes at a minimal cost associated with the consumption of public services (i.e., the treatment vs. control areas are extremely close to one another geographically), but also that these negative effects do not hold at the countywide levels. There, we find evidence that the monetary costs associated with higher commercial impact fees are always either offset, or are even more than fully offset, by the value associated with the correspondingly higher quality public infrastructure. Importantly, impact fees that are paid by residential developers but not by commercial developers (e.g., school impact fees) are uniformly found to increase the level of business establishments, local employment, and retail sales, across both sets of models.

The following section develops a theoretical framework considering the relationship between development impact fee programs and business location decisions and reviews the relevant literature. Section III describes the impact fee and business establishment

data. Section IV outlines our empirical approach. Section V presents our main empirical results. Section VI concludes.

Theoretical Framework and Existing Literature

Since programs in Florida and California date to the late 1970s, development impact fees are now roughly four decades into their relatively brief history. Impact fees are one time charges a developer pays a local government during the permitting process, according to a predetermined schedule. [2] The funds generated by impact fees are pooled over time, and are used to pay for local public infrastructure improvement/expansions. Their usage has increased dramatically over recent decades, reaching the point where more than 1,000 local governments in the United States, including the vast majority of urban and suburban governments in states experiencing population, now have programs (Nelson et al. 2008).

However, even as impact fee programs have established a stronghold in local public finance, they remain controversial. Opponents claim they deter economic development and entrepreneurial activity – an understandable (but potentially incomplete) position given the nature of our current findings.[3] Advocates argue they create efficient Coasian bargaining arrangements between communities and developers, reducing uncertainty and raising the chances developers' proposals are approved (Nelson et. al, 1992; Burge and Ihlanfeldt, 2006b). Both sides of the debate feel armed with evidence to support their claims – something that seems not at all surprising given our current findings. Like other local revenue raising mechanisms – development impact fees lead to distinct costs and benefits, create winners and losers according to predictable margins, and may lead to unforeseen problems at the expense of potentially solving others. Most recent work considering development impact fees follows the theoretical foundations laid by Brueckner (1997) and Yinger (1998), both of whom specifically address the role played by the value of the infrastructure provided by the fee revenues to commercial and residential interests in the community. As a more detailed review of this debate lies beyond the scope of this working paper, we point interested readers to Been (2005).

The Link between Impact Fee Programs and Business Location Decisions

The effects of impact fees on the intensity and location of local commercial activity should depend upon whether communities use impact fee programs as exclusionary growth controls or as accommodating growth management tools. In previous work posing this question, scholars have highlighted the importance of pinning down the relevant counterfactual for development impact fee programs. Altshuler and Gomez-Ibáñez (1993) point out that they "look better or worse – in terms of equity, efficiency, or political acceptability – depending on the specific alternatives one considers most

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[2] Although *impact fee* and *development fee* are most commonly used, the terms *capacity fee, facility fee, system development fee, (capital) expansion fee, and (capital) mitigation fee* are also seen. When the term *exaction* is used, it generally refers to a requirement of direct in-kind contributions from the developer.
[3] For example, the positions of the National Association of Home Builders (http://www.nahb.org) and the National Association of Realtors (http://www.realtor.org) discuss these potentially negative effects.

relevant analytically or most probable in reality." Most scholars in the economics and public administration literature have taken the position that rapidly growing communities tend to adopt impact fee programs as a *growth management strategy*, potentially as a substitute for other exclusionary barriers, rather than as a growth control. For example, Fischel (1990) asks an interesting question regarding the possibility that an impact fee program were to be struck down in court: "the question is, would the community go back to its old ways of cheaply accommodating developers, or would it adopt more strict land use regulations that forestalled nearly all development? If prohibition of fees makes the community opt for more stringent regulations, then it seems to me that the impact fee is progrowth." Following a similar argument, Gyourko (1991) concludes that impact fees represent a market-like price, paid in return for entry into a desirable community/location. He contends that once impact fees are in place, the stringency of other unobservable exclusionary barriers should be reduced. Finally, Ladd (1998) argues that rapidly expanding communities without impact fee programs place local officials in a position where they have no effective responses to political pressure from anti-growth contingencies. With impact fee programs in place, she argues local governments can assert they are already taking a more reasonable approach to managing growth when trying to appease anti-growth groups (i.e., and then pair that action with approval of the controversial project). Burge and Ihlanfeldt (2006a) provide some empirical support for this idea as it applies to apartments, a politically controversial development category.

Still, impact fee programs add a direct monetary cost to a given developer's plate – creating an undeniable obstacle to the outcome of building new commercial facilities. For example, in our data, developers of retail space may have to pay fees as high as $20,000 per 1,000 square feet of space – implying that an average sized new Wal-Mart store (105,000 square feet according to Wal-Mart) would pay roughly $2.3 million in impact fees. It is hard to imagine a developer would ignore a liability of this magnitude when selecting an optimal location for new construction – particularly as one considers an investigation of the intensity of economic activities near county borders. For example, a community charging higher road impact fees may very well reach a predictably higher level of quality regarding their transportation system than a neighbor charging lower road impact fees. However, a relevant question is, to what extent do locations arbitrarily close to the border between the high and low impact fee environment truly consume different transportation systems? The border creates a natural experiment where businesses on either side of the border share a common 'location', but only one side of the border carries the higher fee. Of course, most communities charge impact fees that are much lower than the above example, and most establishments are smaller than Walmart – but the point still remains that large financial incentives are attached to location decisions.

While we are not aware of previous work that investigates the effects of impact fee programs on levels of new business establishments or the level of local retail sales, there is a small literature that considers the effects of impact fee programs on levels of local employment and other economic outcomes. Nelson and Moody (2003) examine a panel of Florida Counties from 1993-1999, using aggregate county impact fee collections (i.e., from all categories of impact fees and all types of developments) as their independent variable. They relate changes in this variable over time to changes in employment levels,

finding that higher impact fees are associated with increased levels of local employment. Jeong and Feiock (2006) also find evidence for the positive employment effect story using similar data from Florida Counties. They move from using aggregate impact fees as the independent variable of interest to a dummy variable registering whether the county had any impact fee program in place. Given that their panel covers 1991-2000, and the fact that very few counties adopted programs during that interval, the empirical identification is then nearly entirely cross-sectional. Using an expanded set of control variable compared to the previous publication on the topic, they conclude the benefits of impact fee programs outweigh the costs for commercial developers.

Burge and Ihlanfeldt (2009) also use County panel data from Florida spanning 1990-2005. Using similar OLS models as the previous two studies, they show one can replicate the qualitative findings using specific impact fee levels that would be paid for particular developments, as opposed to countywide aggregate collections or a dummy variable for whether a program is in place. Importantly though, the positive effects of impact fees on employment levels finding falls apart once the empirical models include (two-way) fixed effects. They conclude that commercial impact fees and residential impact fees have countervailing effects on employment levels – with commercial fees deterring jobs but school impact fees attracting jobs. To our knowledge the only previous empirical work specifically considering the potential effects of impact fees on the number of firms in a jurisdiction comes from Jones (2015). Focusing on 'small-draw' firms (supermarkets, convenience stores, restaurants, dry-cleaners, and liquor stores), and using a binary impact fee variable indicating whether or not an impact fee program was in place, the paper concludes that counties with impact fee programs have fewer restaurants per capita, but finds no significant correlations with the rates of other establishments. We seek to add to the literature on the topic by expanding the analysis to focus on new business establishments, refine the empirical approach by incorporating fixed effects countywide panel data regressions as well as bringing quasi-experimental variation into focus through our border's approach, and to be the first study (with the exception of Burge and Ihlanfeldt, 2009) to use actual dollar magnitudes in different categories of impact fees as they change over time in a lengthy panel.

Nuances of Impact Fee Programs: What Margins Matter?

As mentioned above, most of the previous studies that have considered the relationship between development impact fee programs and levels of local business activity have measured impact fees in a blunt manner. For example, it is difficult to imagine a dummy variable indicating the presence of a county impact fee program (i.e., a fee of any type, set at any level, and having been in place for any number of years) accurately reflects the manner in which the development impact fee program influences the various costs and benefits of locating a business in a given location.

In light of this, we start by assuming that the actual dollar amount of a given impact fee, as well as the specific category of new construction paying (and not paying) the impact fee, should play an important role in our empirical analysis. For example, school (education) impact fees are one of the most expensive categories of fees applied by local

governments in Florida, and they represent the most rapidly growing categories of fees. However, due to legal concerns related to the rational nexus test, educational impact fees are only levied on residential construction. Of course, school impact fees have been found to increase the overall desirability of operating within a community by lowering property taxes (Ihlanfeldt and Shaughnessy, 2004) and they clearly provide additional revenue to the implementing community at no cost direct cost to a commercial developer. As such, it is plausible that higher school impact fees could positively influence the likelihood of business activity selecting a location with higher school impact fees. For commercial impact fees – including fees for categories including transportation, utilities, fire, public safety, and other various public services – clear costs and benefits are both present – making the predicted effect on levels of new business establishments, total business establishments, employment levels, and other measures of economic activity theoretically ambiguous.

Data

Our unique 20 year panel comes from Florida's 67 counties and covers the years 1997 through 2016. Table 1 lists all variables along with their descriptions and sources. Our variables can be grouped into two conceptual categories: 1) impact fee related variables, 2) variables related to business/economic activity. In both cases, we generate separates variables for each of the two distinct empirical approaches we further describe below – the countywide models and the border models. For the countywide models, we focus only on the counties own levels of impact fees, while for the border models impact fee rates enter as differentials, relative to the cross-border neighbor. We first discuss the hand-collected impact fee data from Florida Counties, then turning attention to the business establishment data.

A complete history of impact fees was obtained for each county by using their respective planning and building departments. In many cases this could be accomplished through their websites (i.e., if documentation was readily available), but in many cases it involved personal contact to track down previous impact fee rates schedules.[4] The vast majority of Florida's counties (52 out of 67) used at least one type of development impact fee during our sample. Additionally, most counties also charged fees across several different services, often changing the size and scope of their programs during our panel. As mentioned above, commercial developers pay impact fees for services as diverse as roads/transportation, water/sewer utilities, police/safety, fire, and public buildings. As such, our impact fee panel provides significant within-jurisdiction and cross-jurisdiction variation. While counties can legally change impact fees at any time they agree upon, a common practice in Florida and other parts of the U.S. has become implementing new

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[4] As previous research examining impact fees from Florida has noted, programs in Florida are primarily imposed by county governments. While cities have the legal right to impose impact fees, and do occasionally charge impact fees for services not provided by county governments, this practice is relatively rare. In the vast majority of cases, city impact fees are either the same size as the county levies – perhaps indicating a form of revenue sharing such that the program is effectively countywide even though it surfaces on both governmental levels records – or the city impact fees are very small relative to those at county levels, possibly indicating they are a small supplemental program.

rates/programs on January 1st of a given year. As such, we define all of our impact fee variables bases on the rates that prevail on January 1st of the year in question.

The fact that our empirical analysis needs impact fee variables for both countywide and border-focused models adds a complication to our analysis. Some development impact fee programs in Florida have distinct 'zones', which are essentially areas over which impact fee rates can vary. Legally, these differences are allowed if the community can document the costs of accommodating new growth with sufficient public infrastructure also differs systematically across areas within their county. While all of our original data from counties using these types of zone-based systems contain these variations by zone, in several cases the actual monetary variation of fees across zones is trivial. For this reason, we designate a county as having economically meaningful impact fee "zones" if the aggregate impact fees applied to otherwise identical construction in different areas in the county differ by 10% (or greater) from one another. Put another way, the cases where impact fee zones were present, but created *maximum differentials of less than 10%*, were treated as a single impact fee zone community. This filter left five counties – Broward, Charlotte, Hillsborough, Osceola, and Seminole – as those with economically meaningful gradients across impact fee zones. By definition, for counties *other* than these five, the variables used in the countrywide models and border-focused models are identical. However, in these cases, we selected the specific impact fee zones that covered the border region when constructing the impact fee variables to be used in the border-focused models. In case where a county-to-county border has portions covered by multiple impact fee zones, the simple arithmetic mean of all zones touching the border was taken.

The first impact fee variable – commercial impact fees – represents the aggregated levies per 1,000 square feet that would be paid by a "typical" commercial development. Of course, there is no such thing as a "typical" commercial development – but rather new commercial construction is a heterogeneous mix of many different types of structures with potentially different impact fee rates. Given the complexity of impact fee schedules paired with our need for a simple aggregated variable, we identified the categories of "general retail", "general office", and "general industrial" for each county, and use the simple average of those three rates. Fortunately, all commercial development pays utility impact fees (e.g., water, sewer, and wastewater/drainage) according to a uniform schedule that calculates the number of equivalent residential units (ERUs) associated with each project's capacity, so utility related impact fees can easily be reflected by simply adding the charge for 1 ERU (an amount that corresponds well with a 1,000 square foot establishment).

The second impact fee variable – school impact fees – represents the fee charged per residential unit in the community for educational services. All Florida counties fall into one of two categories regarding this variable. The first type uses a fixed fee, such that large and small homes pay the exact same rate. The second introduces some variability based on the size or number of bedrooms of the home. However, the difference in charges for small and large homes is typically small. For our study, we use the school

impact fee rate that would be levied on a 1,800 square foot, 3 bedroom home.[5] Importantly for our later presented panel data estimations, the changes in school impact fee rates do not seem to be correlated with the timing of changes to the commercial impact fee variable. Investigation of the data reveals that, while the levels of the two variables are positively correlated within communities over the long run, their first-differenced values are not. That is to say, communities with higher commercial impact fees do also have higher school fees, but the timing of rate increases in each of the two variables is independent.

In order to implement both county panel analysis and our spatial border approach we need detailed establishment-level data that contains information on location, industry, employment and sales. Our source for this information is the Infogroup's Historical Business Database, which provides longitudinal establishment-level data sets for all establishments in the entire United States. The data consists of annual information on every business from 1997 to 2015 and is extensive with approximately 35 million establishments each year. The data contains a wealth of establishment information, including exact location (latitude and longitude), address of each establishment, age of the establishment, number of employees, sales volume, detailed industry code, and corporate linkages. Since our unit of analysis is the county for our county panel fixed effects analysis, we aggregate this data to the county level. We define a business as new if they have been in service one year or less. Likewise, we define a business as an existing establishment if they have been in business for four or more years. This provides for some separation between new and existing firms as well as allows for some time to occur for business turnover. From this data set we are able to determine the number of establishments, employees, and sales for all-age, new and existing establishments in every county and border area in Florida.

Empirical Methodology

There are two important empirical challenges the researcher needs to overcome to estimate causal effects of development impact fees on businesses: potential endogeneity concerns of development impact fees and properly controlling for the determinants of business location, particularly time-varying unobserved area characteristics. Endogeneity concerns exist because factors that determine development impact fee policies, which are determined and implemented at the county, are likely correlated with business and commercial development in ways unobserved to the researcher. The direction of this potential bias is ambiguous. It is possible that counties experiencing an economic boom will respond by increasing their development impact fees. Gyourko (1991) speculates this may occur if local governments behave opportunistically by levying higher rates that they know the market can bear. On the other hand, local governments in economically depressed areas could be more likely to increase development impact fees in order to offset declines in other revenue streams. Therefore, we need to follow a methodology that

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[5] This cutoff is selected for consistency with previous empirical studies in the literature. At a statewide level, approximately half the housing stock lies above/below this cutoff.

successfully minimizes the unobserved differences in local economies between areas with and without development impact fee changes.

One could categorize business location determinants into three groups: time-invariant area-specific attributes, time-varying attributes that affect all areas, and time-varying area-specific attributes. Our first method is to use county-level panel fixed effects estimation. The strengths of this approach is that it properly accounts for time-invariant county-wide business determinants (such as proximity to large cities and ports) using county fixed effects, γ_j, and time-varying attributes that are common across Florida, (such as business cycle shocks) with year fixed effects, μ_t. Our estimating equation is then:

$$Y_{jt} = \beta DIF_{jt} + \gamma_j + \mu_t + u_{jt}$$

where t and j are time and area (in this case county) respectively, Y represents measures of business development (number of establishments, employment or sales) in county j in time period t, DIF indicates the development impact fees for the county while γ_j, and μ_t represent area and time fixed effects. To understand the persistence of the effects we also produce estimates measure business development 1, 2 and 3 years in the future.

However, a potential weakness is adequately accounting for time-varying area-specific (county in this case) attributes, therefore we utilize a spatial border approach to complement the panel fixed effect method. Using geographic information systems (GIS) software, we created 1-mile buffer zones around county borders to create two contiguous areas. The idea is that the spatial border approach minimizes area-specific factors that only affect one side of the border pair because they are within one mile of each other and are more likely to have similar local economic conditions in both levels and trends. Therefore, each border area pair contains a valid treatment-control-pair that experience similar economic influences, except that one side experiences a change in development impact fee policy. Figure 1 visually illustrates the spatial border approach we implement. In this setting the identifying assumption is that time-varying area characteristics, like local economic conditions, vary similarly across short distances.

Results

We begin our analysis with our county fixed effect approach. Tables 2 through 4 are structured identically with Panels A, B and C displaying estimates for all-aged establishments, new establishments (1 year or less in age) and existing establishments (4 or more years in age) respectively. Column 1 present estimates of development impact fees in the year they were levied while columns 2, 3, and 4 show effects 1, 2 and 3 years after the fees were levied. For all county fixed effect analysis standard errors are clustered at the county level.

Table 2 presents estimates of the effect of development impact fees on the percent change in the number of establishments in the county. Beginning with Panel A, we find commercial impact fees seem to have little to no effect on the growth of the number of

establishments in a county with point estimates being quite small and statistically insignificant. These results would suggest that development impact fees do not inhibit business development. Interestingly, we find that an increase in school impact fees of $1,000, which are paid by residential developers and not commercial developers, have a positive impact on the growth of the number of business establishments in the county. These results are economically meaningful with a $1,000 increase in school impact fees leading to a 1.33 percentage point increase in the growth of establishments in the year it is levied with a modest decline over time to 0.68 percentage point increase three years after the fees are implemented. These results suggest business development prefers to locate in areas that increase the tax burden residential development has to pay relative to commercial development. Panel B examines the growth in the number of new establishments (1 or less years of service) and finds a similar pattern of no effect on increases in commercial development impact fees but a positive effect related to school impact fees, although the result dissipates once further away than a one year window after the fees are implemented. Results for existing (4 or more years of service) businesses find small positive effects of commercial development impact fees, with a 0.381 percentage point increase in existing business growth the year it is levied with some degree of persistence. These results either suggest that the benefits that are provided by these fees outweigh the financial impact of these fees, or that communities tend to adopt and/or increase impact fees as they are experiencing or anticipating high rates of economic growth. Since evidence for both stories is plausible and consistent with other studies in the literature, we frame these results as an interesting starting point for a discussion, but we are also motivated to rely more heavily on the borders-approach to identify the causal effects we are interested in. The school impact fee results continue to support the idea that the business community are positively affected when the burden of the development impact fees are shared with the residential community.

Table 3 examines how employment growth is affected by development impact fees. Overall, results suggest both commercial and school development fees increase lead to employment growth in the local economy. For instance, column 1 of Panel A indicates a $1,000 increase in commercial development impact fees leads to a 0.92 percentage point increase in employment growth while a $1,000 increase in school development impact fees increases employment growth by nearly 1 percentage point. This positive employment effect overall seems to be driven by existing business. Note that when a county increases impact fee rates – previous developers are of course free from these burdens as they have already paid – whereas all new development would be subject to the new higher rates. Table 4 examines growth in the sales of business when development impact fees are enacted and finds little effect on sales with the exception of a small positive effect in the first year or so of a school development impact fee. To summarize the county fixed effect estimation results, we find strong evidence that school impact fees lead to positive local business growth with some mixed evidence that existing firms experience meaningful positive effects of commercial impact fees.

However, it is possible that our results are biased due to reverse causality. It could be the case that areas that are booming want to slow down development and therefore increase their development impact fees. Alternatively, they may not be as interested in slowing

growth as they are in opportunistically gaining more tax revenue – essentially the Gyourko conjecture we mentioned earlier. In other words, changes in development impact fee rates may be correlated with local economic conditions. Therefore, in Tables 5, 6 and 7 we present estimates from our quasi-experimental approach examining only business activity within one-mile of the county border. By comparing contiguous border areas within a mile of each other the methodology attempts to mitigate differences in local economic conditions both in levels and trends. All regression here include border-area pair fixed effects with both dependent and independent variables differenced.

We begin our border analysis with Table 5 that examines the growth in the number establishments. Results for businesses of all ages suggest significant negative effect of an increase in commercial impact fees in all post years of our analysis. For instance, column 2 of Panel A finds a $1,000 increase in commercial development impact fees leads to a 2.1 percentage point decline in the number establishments relative to its contiguous border area. It is important to note that given the border analysis design this gives us the relative difference between the two border areas. If all the business loss simply went to the other side of the border then we are "double counting" the effect and the loss to the increased fee side is actually half the size of the point estimate, however if none of the loss of business activity went to the neighboring side the increased fee side lost all of the 2.1 percentage points of business activity. Nonetheless, Table 5 suggests commercial development impact fees adversely affect the growth in the number of establishments. Panels B and C show that this negative effect of the commercial impact fee is borne by both new and exist establishments. Focusing on the school development impact fee results, we still find positive effect on the growth in the number of establishments in the year immediately after their implementation, but this effect dissipates in years two and three.

Table 6 presents effects of commercial and school development impact fees on the growth of employment in the border areas. Results suggest that employment growth is substantively affected by commercial development impact fees with contemporaneous effects indicating a 4 percentage point decrease in employment with a $1,000 increase in the commercial fee retaining some persistence three years after the fee increase with a 2.73 percentage point decrease. This negative effect on the commercial side is driven by a loss of employment at new firms and some evidence initially in existing firms. Interestingly, there is little evidence that school impact fees positively affect employment growth with the exception of a contemporaneous effect for new firms of 2.97 percent points. Moving to effects on the sales of businesses in the border areas we find a similar story that commercial development impact fees have a relatively short negative effect on sales growth with economically important magnitudes of 7.6 and 5.38 percentage point decreases in years 0 and 1 respectively. Sales growth improves, particularly in existing firms, when local jurisdictions increase school impact fees. To summarize results from our border analysis in Tables 5-7, commercial development impact fees are found to have a deterrent effect on local business activity, when locations are compared to their contiguous neighbors that both lie within the close border proximity. Although not as robust as the commercial impact fee findings, there is evidence that when jurisdictions

place a greater tax burden on residential development through higher school impact fees, it positively effects business development.

Conclusions

Development impact fee programs represent a novel and potentially beneficial approach that local governments can use to cover the costs associated with new public infrastructure as expanding economic activity places pressures on existing systems within the community. While previous work has investigated many of the efficiency and equity related questions that stem from using impact fee programs, the prior literature was unclear on many points related to how impact fees might influence business location decisions. Importantly, opponents of development impact fee programs have forcefully claimed over a period of many decades that they will deter economic development and job growth within the implementing communities.

This working paper finds evidence to support this claim – but in a narrowly defined context. Specifically, we find that commercial impact fees deter business activity near jurisdictional borders with communities that charge lower impact fee rates. We find $1,000 gap in impact fees at the border is associated with a decline in the number of business establishments (on the high impact fee side relative to the low impact fee side) of approximately two to three percent. We find the differential in employment levels typically fall between four and five percent. Finally, the gap in retail sales level is larger, estimated to fall between five and seven percent. While these gaps are found to dissipate over time – possibly as other factors related our core relationship of interest adjust – we still find these border-approach results to be strikingly in favor of the "growth-deterrent" view of development impact fees.

However, just as striking is the complementary result that this negative relationship does not surface when our outcomes of interest are measured at the county aggregated level. Intuitively, if impact fee revenues are used by communities following legal requirements – namely to provide new public infrastructure – then it is reasonable to expect the quality and quantity of local public goods is superior in the presence of impact fee revenues as compared to a community without fees. But even if one accepts the reasonable premise that the businesses would generally be attracted to locations providing higher quality public services, the borders-focused approach compares locations of small distances to one another. While this forms a powerful treatment vs. control pairing that allows a narrowing of the focus onto only the monetary costs associated with impact fee programs – it may not do the best job of characterizing the overall manner in which development impact fee programs would tend to be viewed by local governments who also care about public service provision levels, and even additionally by business interests that are locating more centrally within the region. Viewed from that vantage point, where both the costs and benefits of development impact fee programs are more fully accounted for, we find that commercial impact fees have insignificant effects on our outcomes of interest – save a few suggestive results where a small positive effect on employment levels of existing establishments surfaces.

The findings presented in this working paper motivate further investigation. Given the relatively large effect we see on retail sales activity near county borders, we plan to dive more deeply into the way specific types of commercial impact fees (e.g., retail, industrial, office space) influence specific sub-categories of commercial activity. This refinement is possible with our data. Additionally, we are curious to see whether or not the underlying governing dynamics of the relationships of interest differ significantly across Florida's urban/suburban areas, as opposed to rural communities.

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Tables and Figures

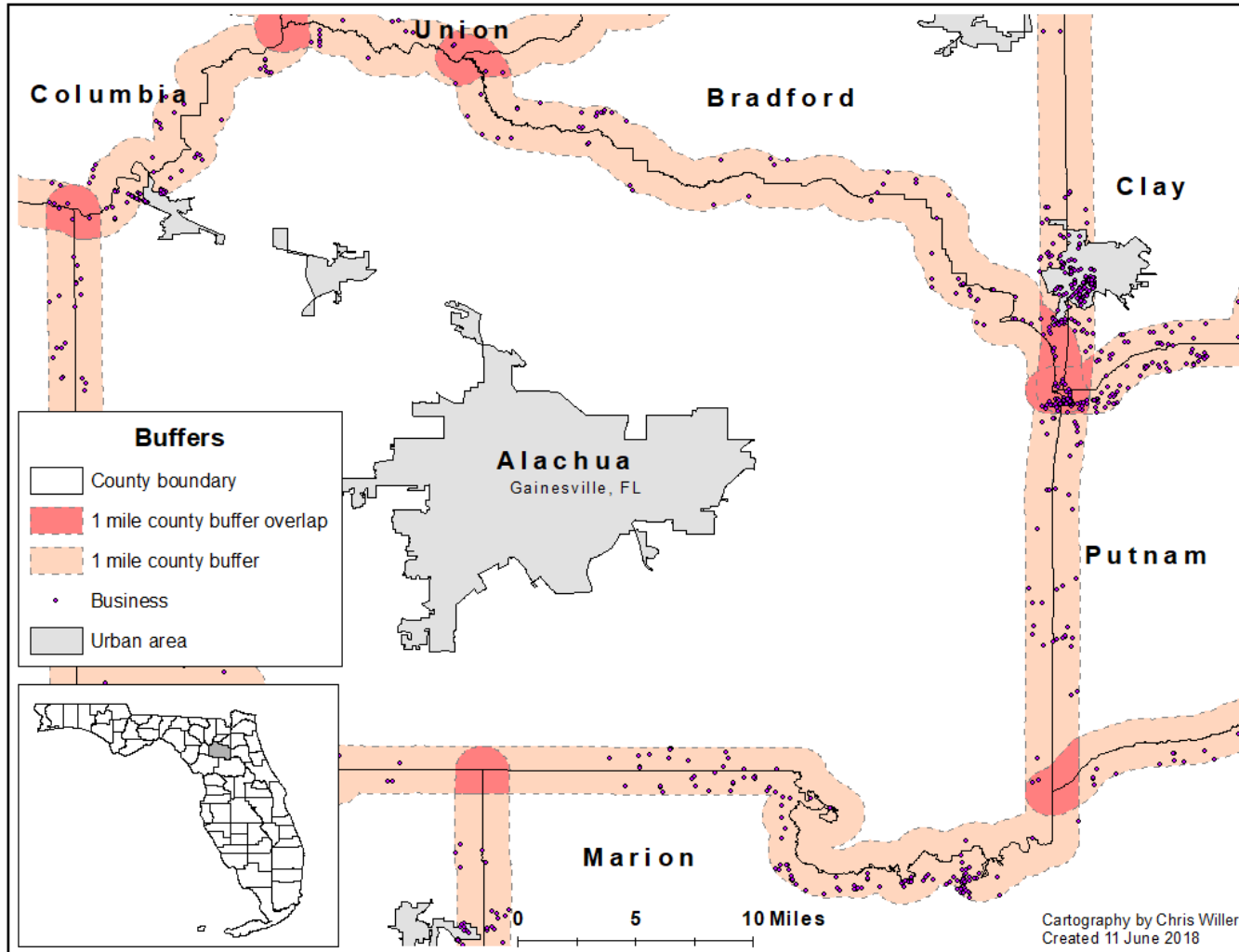Figure 1: Visual Representation of the border methodology.

Table 1: Summary statisics for Development Impact Fee Data and Business Data

Panel A: Development Impact Fee Data					
County-level	Mean	St. Dev.	BorderArea-Side A	Mean	St. Dev.
Commercial Impact Fee			Commercial Impact Fee		
All Years	3566.69	3627.09	All Years	3812.203	3995.02
First Year (1997)	2329.9	2286.9	First Year (1997)	2581.496	2219.09
Last Year (2013)	4144	2376.05	Last Year (2013)	4257.577	4672.79
School Impact Fee			School Impact Fee		
All Years	990.11	2043.91	All Years	1107.438	2269.8
First Year (1997)	219.15	484.42	First Year (1997)	296.196	572.69
Last Year (2013)	1337.5	2376.05	Last Year (2013)	1427.608	2565.12

Panel B: Business Data for All Industries					
County-level	Mean	St. Dev.	BorderArea-Side A	Mean	St. Dev.
# of Establishments			# of Establishments		
Total (All-Ages)	3165.85	10126.06	Total (All-Ages)	132.054	496.249
New Est. (<=1 year old)	401.68	1353.31	New Est. (<=1 year old)	19.175	76.933
Existing Est. (4+ years old)	1961.355	6249.75	Existing Est. (4+ years old)	77.995	299.75
Employees			Employees		
Total (All-Ages)	30908.7	106285.3	Total (All-Ages)	1361.8	5516.2
New Est. (<=1 year old)	1932.38	6829.26	New Est. (<=1 year old)	101.322	433.879
Existing Est. (4+ years old)	24318.22	86519.8	Existing Est. (4+ years old)	1025.82	4309.54
Sales (in thou.)			Sales (in thou.)		
Total (All-Ages)	5225.358	18329.35	Total (All-Ages)	263.855	1092.87
New Est. (<=1 year old)	468.423	1749.949	New Est. (<=1 year old)	30.192	178.85
Existing Est. (4+ years old)	3741.07	13343.34	Existing Est. (4+ years old)	180.619	774.013

Table 2: County-level Fixed-Effect Estimates of Impact Fees on the Growth of the Number of Establishments

Dependent Variable: Ln(# of Est.)	Years After Impact Fee Changes			
	Contemporaneous	One Year After	Two Years After	Three Years After
Panel A: All-Aged Establishments				
Commercial Impact Fees ($1,000 increase)	0.0004	0.0008	0.0019	0.0026
	(0.0019)	(0.0020)	(0.0020)	(0.0021)
School Impact Fees ($1,000 increase)	0.0133***	0.0132***	0.0104***	0.0068***
	(0.0021)	(0.0022)	(0.0023)	(0.0024)
Panel B: New (<=1 year old) Establishments				
Commercial Impact Fees ($1,000 increase)	0.0032	0.0072	0.0134	0.0157
	(0.0118)	(0.0119)	(0.0126)	(0.0132)
School Impact Fees ($1,000 increase)	0.0307**	0.0239*	0.0050	-0.0090
	(0.0131)	(0.0133)	(0.0141)	(0.0152)
Panel C: Existing (4+ years old) Establishments				
Commercial Impact Fees ($1,000 increase)	0.0038*	0.0035	0.0039*	0.0036
	(0.0021)	(0.0021)	(0.0021)	(0.0022)
School Impact Fees ($1,000 increase)	0.0101***	0.0096***	0.0077***	0.0069***
	(0.0023)	(0.0023)	(0.0024)	(0.0025)

Notes:
A unit of observation is a county in a given year. All regressions include Year and County Fixed Effects. Each dependent variable is the natural log of the number of establishments, so coefficients are the approximate percent change in the number of establishments associated with a $1,000 increase in impact fees. Asterisks denote statistical significance at the 10% (*), 5% (**) and 1% (***) levels of confidence.

Table 3: County-level Fixed-Effect Estimates of Impact Fees on the Growth of Employment

| | | Years After Impact Fee Changes | | |
Dependent Variable: Ln(# of Est.)	Contemporaneous	One Year After	Two Years After	Three Years After
		Panel A: All-Aged Establishments		
Commercial Impact Fees ($1,000 increase)	0.0092***	0.0088***	0.0065**	0.0068**
	(0.0029)	(0.0031)	(0.0032)	(0.0035)
School Impact Fees ($1,000 increase)	0.0100***	0.0119***	0.0121***	0.0088**
	(0.0032)	(0.0034)	(0.0036)	(0.0040)
		Panel B: New (<=1 year old) Establishments		
Commercial Impact Fees ($1,000 increase)	0.0001	0.0013	0.0021	0.0074
	(0.0158)	(0.0164)	(0.0174)	(0.0186)
School Impact Fees ($1,000 increase)	0.0316*	0.0260	0.0103	-0.0078
	(0.0176)	(0.0183)	(0.0194)	(0.0213)
		Panel C: Existing (4+ years old) Establishments		
Commercial Impact Fees ($1,000 increase)	0.0112***	0.0121***	0.0104***	0.0104***
	(0.0033)	(0.0034)	(0.0036)	(0.0038)
School Impact Fees ($1,000 increase)	0.0086**	0.0080**	0.0072*	0.0054
	(0.0037)	(0.0037)	(0.0040)	(0.0044)

Notes:
 A unit of observation is a county in a given year. All regressions include Year and County Fixed Effects. Each dependent variable is the natural log of the number of establishments, so coefficients are the approximate percent change in the number of establishments associated with a $1,000 increase in impact fees. Asterisks denote statistical significance at the 10% (*), 5% (**) and 1% (***) levels of confidence.

Table 4: County-level Fixed-Effect Estimates of Impact Fees on the Growth of Retail Sales

Dependent Variable: Ln(# of Est.)	Years After Impact Fee Changes			
	Contemporaneous	One Year After	Two Years After	Three Years After
Panel A: All-Aged Establishments				
Commercial Impact Fees ($1,000 increase)	0.0037	0.0027	0.0033	0.0043
	(0.0036)	(0.0038)	(0.0039)	(0.0042)
School Impact Fees ($1,000 increase)	0.0091**	0.0092**	0.0068	0.0039
	(0.0040)	(0.0042)	(0.0044)	(0.0048)
Panel B: New (<=1 year old) Establishments				
Commercial Impact Fees ($1,000 increase)	0.0037	0.0088	0.0163	0.0231
	(0.0175)	(0.0182)	(0.0194)	(0.0208)
School Impact Fees ($1,000 increase)	0.0372*	0.0295	0.0077	-0.0002
	(0.0194)	(0.0203)	(0.0217)	(0.0240)
Panel C: Existing (4+ years old) Establishments				
Commercial Impact Fees ($1,000 increase)	0.0037	0.0030	0.0036	0.0025
	(0.0041)	(0.0042)	(0.0044)	(0.0047)
School Impact Fees ($1,000 increase)	0.0061	0.0030	0.0001	-0.0015
	(0.0046)	(0.0047)	(0.0050)	(0.0054)

Notes:
 A unit of observation is a county in a given year. All regressions include Year and County Fixed Effects. Each dependent variable is the natural log of the number of establishments, so coefficients are the approximate percent change in the number of establishments associated with a $1,000 increase in impact fees. Asterisks denote statistical significance at the 10% (*), 5% (**) and 1% (***) levels of confidence.

Table 5: Border Area-level Fixed-Effect Estimates of Impact Fees on the Growth of the Number of Establishments

Dependent Variable: Ln(# of Est.)	Contemporaneous	One Year After	Two Years After	Three Years After
			Years After Impact Fee Changes	
			Panel A: All-Aged Establishments	
Commercial Impact Fees ($1,000 increase)	-0.0266***	-0.0210***	-0.0169*	-0.0236**
	(0.0073)	(0.0080)	(0.0086)	(0.0094)
School Impact Fees ($1,000 increase)	0.0211**	0.0222**	0.0096	0.0162
	(0.0083)	(0.0093)	(0.0102)	(0.0116)
			Panel B: New (<=1 year old) Establishments	
Commercial Impact Fees ($1,000 increase)	-0.0225***	-0.0226***	-0.0241**	-0.0305***
	(0.0083)	(0.0087)	(0.0094)	(0.0099)
School Impact Fees ($1,000 increase)	0.0124	0.0173*	-0.0003	0.0128
	(0.0095)	(0.0101)	(0.0111)	(0.0122)
			Panel C: Existing (4+ years old) Establishments	
Commercial Impact Fees ($1,000 increase)	-0.0252***	-0.0212***	-0.0123	-0.0150*
	(0.0072)	(0.0078)	(0.0083)	(0.0090)
School Impact Fees ($1,000 increase)	0.0209**	0.0184**	0.0053	0.0093
	(0.0082)	(0.0091)	(0.0098)	(0.0111)

Notes:
A unit of observation is a county in a given year. All regressions include Year and County Fixed Effects. Each dependent variable is the natural log of the number of establishments, so coefficients are the approximate percent change in the number of establishments associated with a $1,000 increase in impact fees. Asterisks denote statistical significance at the 10% (*), 5% (**) and 1% (***) levels of confidence.

Table 6: Border Area-level Fixed-Effect Estimates of Impact Fees on the Growth of Employment

Dependent Variable: Ln(# of Est.)	Years After Impact Fee Changes			
	Contemporaneous	One Year After	Two Years After	Three Years After
Panel A: All-Aged Establishments				
Commercial Impact Fees ($1,000 increase)	-0.0400***	-0.0369***	-0.0231*	-0.0273*
	(0.0122)	(0.0132)	(0.0139)	(0.0152)
School Impact Fees ($1,000 increase)	0.0015	-0.0040	-0.0229	-0.0243
	(0.0139)	(0.0152)	(0.0164)	(0.0188)
Panel B: New (<=1 year old) Establishments				
Commercial Impact Fees ($1,000 increase)	-0.0474***	-0.0478***	-0.0356**	-0.0313*
	(0.0154)	(0.0160)	(0.0172)	(0.0181)
School Impact Fees ($1,000 increase)	0.0297*	0.0304	-0.0069	0.0119
	(0.0177)	(0.0185)	(0.0203)	(0.0224)
Panel C: Existing (4+ years old) Establishments				
Commercial Impact Fees ($1,000 increase)	-0.0345***	-0.0298**	-0.0103	-0.0169
	(0.0132)	(0.0141)	(0.0149)	(0.0159)
School Impact Fees ($1,000 increase)	-0.0038	-0.0040	-0.0206	-0.0214
	(0.0151)	(0.0164)	(0.0175)	(0.0197)

Notes:
A unit of observation is a county in a given year. All regressions include Year and County Fixed Effects. Each dependent variable is the natural log of the number of establishments, so coefficients are the approximate percent change in the number of establishments associated with a $1,000 increase in impact fees. Asterisks denote statistical significance at the 10% (*), 5% (**) and 1% (***) levels of confidence.

Table 7: Border Area-level Fixed-Effect Estimates of Impact Fees on the Growth of Retail Sales

Dependent Variable: Ln(# of Est.)	Contemporaneous	One Year After	Two Years After	Three Years After
			Years After Impact Fee Changes	
	Panel A: All-Aged Establishments			
Commercial Impact Fees ($1,000 increase)	-0.0760***	-0.0538**	-0.0161	-0.0274
	(0.0246)	(0.0258)	(0.0278)	(0.0299)
School Impact Fees ($1,000 increase)	0.0572**	0.0457	0.0213	0.0615*
	(0.0281)	(0.0298)	(0.0328)	(0.0370)
	Panel B: New (<=1 year old) Establishments			
Commercial Impact Fees ($1,000 increase)	-0.0494	-0.0292	-0.0361	-0.0443
	(0.0397)	(0.0411)	(0.0439)	(0.0466)
School Impact Fees ($1,000 increase)	-0.0002	0.0442	-0.0049	0.0869
	(0.0455)	(0.0476)	(0.0518)	(0.0577)
	Panel C: Existing (4+ years old) Establishments			
Commercial Impact Fees ($1,000 increase)	-0.1310***	-0.0994***	-0.0209	-0.0247
	(0.0292)	(0.0299)	(0.0312)	(0.0332)
School Impact Fees ($1,000 increase)	0.0718**	0.0591*	0.0235	0.0592
	(0.0335)	(0.0346)	(0.0368)	(0.0411)

Notes:
 A unit of observation is a county in a given year. All regressions include Year and County Fixed Effects. Each dependent variable is the natural log of the number of establishments, so coefficients are the approximate percent change in the number of establishments associated with a $1,000 increase in impact fees. Asterisks denote statistical significance at the 10% (*), 5% (**) and 1% (***) levels of confidence.