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EMPIRICAL EVIDENCE ON MUNICIPAL TAX POLICY AND FIRM GROWTH

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ABSTRACT

There is relatively little research on whether city business tax structures either attract or repel business activity. Using very precise establishment-level data, the study examines the economic impacts of such taxes on all U.S. cities with populations over 40 thousand. Results indicate that activity-based city business taxes and sales taxes had statistically significant effects on the growths of business establishments and their related employment.

Keywords: Taxation, Employment, Establishments, City, Business, Policy.

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Contribution/ Originality

This is the first study to document overall business taxes paid by firms in U.S. cities. This is also the first study to show that higher levels of such city business taxes reduce employment and the number of establishments in U.S. cities.

1. INTRODUCTION

While there is a considerable body of research indicating that national and state/province tax structures can affect business growth (see literature surveys in (Bartik, 1991;1992; Buss, 2001; McGuire, 2003)) there is less evidence on the effectiveness of *municipal* tax structures. The question naturally arises as to whether reductions in municipal taxes can effectively increase economic activity and create jobs. The answer is not obvious. On one hand, such taxes are perceived as small relative to state/province and national taxes, and therefore unimportant at the margin to decision makers. On the other hand, since adjoining municipalities are often very similar in terms of markets and infrastructure, differences in tax structures might be salient, an argument made by business communities in higher-taxed cities.[1] As discussed in the next section, while some studies of European cities have found that local taxes can matter, U.S. based studies thus far have not been broadly generalizable.

The topic addressed here is of policy importance not only because it may guide local lawmakers, but because it gets to the question of whether taxes matter. Because city level taxes are among the smallest, the findings that taxes matter here adds support for the importance of taxes in other settings. Another important policy issue relates to the efficacy of incentives. As pointed out by Bartik (1991) local incentives have become increasingly prevalent, yet their net social benefits are not clear in all cases. To the extent levels of city business taxes reflect incentives, the findings here are suggestive of whether lower taxes should be sought by local lawmakers.

[1] For typical examples in the U.S. see "LA Officials Move Closer to Reducing Tax on Gross Receipts" (*LA Times*, January 26 2015);"Philly's Dubious Wage Tax Just tuned 75; Here's It's Dubious Legacy" (*Technically Philly*, December 12, 2014); and "Not Easy For New Yorkers to Escape Big Apple's Tax Bite"(*Forbes*, September 17, 2013).

2. LITERATURE

Bartik (1991) examined the relatively sparse pre-1990 empirical work on the effectiveness of *local* fiscal variables on economic development, and concluded that these studies generally indicate that local taxes resulted in a statistically significant impact on economic development. He suggested that because non-tax factors tend to be similar between adjoining cities (i.e., they share local labor and other markets, as well as some infrastructure), differences in city tax structures should matter since they may be among the few distinguishing characteristics between such cities. The city tax studies summarized in Bartik typically focused on property taxes, or on other taxes but only in a select number of municipalities. These studies were primarily of U.S. localities.

There have been relatively few studies of local taxes in the two decades following Bartik's literature reviews. Luce (1994) found that local taxes had a statistically significant influence on location of firms in the Philadelphia area. On the other hand, Wasmer and Anderson (2001) examined 112 Detroit area cities and found that only some incentives affect the local value of commercial and manufacturing property. Wu (2010) examined 351 Massachusetts municipalities and found that property taxes had significant impact on business location and the related share of taxes borne. Similarly, Dye *et al.* (2001) found that Chicagoland property taxes (and related classifications) had a negative influence on business activity. Mark *et al.* (2000) found that sales and property taxes reduced employment growth in the District of Columbia area (DC, and nearby Virginia and Maryland communities).

Recent studies of European city taxes have found that city taxes can have an effect on industry location. Unlike their U.S. counterparts, these studies were at a national level. Rathelot and Sillard (2008) found that city-level corporate income taxes decreased the number of plants in French cities over the 1994-2003 period. Duranton *et al.* (2011) found that while higher local property taxes did not decrease the number of new manufacturing plants in England, higher taxes did reduce employment.

This study extends the prior U.S. literature examining U.S. cities by examining the impacts of a broad variety of city business taxes, over a wider cross-section of geographic areas, and over a lengthy time period. Specifically, I pose the following:

Hypothesis: Ceteris paribus, higher levels of city business taxes reduce city employment and the number of establishments in a city.

3. DATA, METHODS, AND HYPOTHESIS

I examine whether city business taxes affect business activity in terms of number of establishments and employment, from 1998-2010. I examine U.S. cities with populations in excess of 40 thousand. On the theory that firms locate in very specific areas and not just in generic city, I examine such city data at the ZIP code level. The sample has 8,187 zip codes and is 803 out of the 18,664 "cities" listed in *County Business Patterns* (CBP) database, discussed below. I examined many of these remaining "cities" and found that many of them were not actually incorporated per se, and as a result did not have taxing authority. The sample cities represent a total 2010 estimated population of 99,889,449 which was approximately 41 percent (the estimated U.S. population from the US Post Office zip code database, discussed below, was 240,388,012, which includes many unincorporated and rural areas). Average population for the sample cities was 12,021 per zip code. The list of these cities is shown is available from the author.

A critical measurement issue here is to precisely match business activity to cities. Most cities cannot tax firms which do not have a physical presence or "nexus" within city borders (see Swenson (2009)). Unfortunately, the only publicly-available *city-level* source with such annual data aggregated to the city level (*County Business Patterns*, or CBP, by the U.S. Census Bureau) provides data for metropolitan *areas* and metropolitan *statistical areas*, which do

not meet the measurement criterion.[2] Fortunately, the same data source collects data on establishments at the zip code level which we can use here. The majority of zip codes are wholly within a single city, but those zip codes which crossed borders were eliminated.[3] Since the research question is whether city business tax structures can encourage or slow economic development, we need some measures of such development. The CBP data allows me to examine employment and number of establishments by zip code and year. The next section discusses how city business taxes are measured.

3.1. City Business Taxes

Cities impose a variety of taxes, licenses, and fees on business. Property taxes are generally set by state and county governments, but cities can often add a small percent to tax bills. Similarly, sales/use taxes are set by states and counties, with cities adding a smaller amount. Although such taxes may be important, separating their incidence between businesses and individuals is challenging since the assessment of such taxes is rarely reported separately for businesses versus individuals.

The major city-imposed taxes on businesses, which are often separately disclosed, tend to be either general business taxes, often in the form of an income tax or other activity-based tax, or specific business taxes, licenses, permits, and fees. The structure of general business taxes varies widely by type, rate, industry, etc. To show this wide variation, consider these examples. Akron, Ohio, has a 2.5% tax on gross payroll plus a 2.5% income tax on firms that pay a state income tax; Baton Rouge, Louisiana has a .1% tax on gross receipts (maximum tax of $2000), except that retail has a separate tax structure (maximum tax of $7500); Jacksonville, Florida has a $5 per employee tax, but retailers and wholesalers have a separate tax structure. Many cities have taxes with no maximums, such as New York City's income tax and Los Angeles' gross receipts tax.

Other business taxes, licenses, and fees also vary widely. Other business taxes include taxes on public utility gross receipts, occupancy taxes for hotel guests, parking taxes, etc. Business licenses and fees can include general and specific activity licenses, construction fees and permits, development impact fees, environmental impact fees, scheduled traffic impact fees, signalization fees, art in public places fees, major thoroughfare/bridge fees, utility user fees and taxes, etc.[4] The sheer variation in such business taxes makes any sort of marginal rate calculation seemingly impossible. Accordingly, deriving an average effective rate seems more sensible.

To establish some perspective on whether municipal business taxes, licenses, and fees are potentially important to businesses, it is necessary first to examine their overall economic significance. To do this, tax revenues at a detailed level, by city, were collected from the *Census of Local Governments* (Bureau of the Census, various years) for 1998 through 2011.[5] From this data, taxes, fees, and licenses imposed on business were isolated. Since larger cities will typically have larger tax collections, it is necessary to scale such collections to gauge their relative importance. We can scale business taxes/licenses/fees as a percent of total city tax collections, and we can also develop an overall, average effective business tax/license/fee *rate*.

To develop this latter statistic, I divide municipal business tax/license/fee collections[6] for each state by state "business income" for that year. Business income is proprietors' incomes for that state and year reported by the

[2] Metropolitan Statistical Area (MSA) level data is an agglomeration of adjoining incorporated cities. In many cases the data also includes unincorporated areas outside of city borders.

[3] The US Postal Office (USPO) has a file of all US zip codes which indicate, among other things, zip codes in terms of belonging to a single city ("primary city") versus multiple cities, the latter of which is denoted as "acceptable city". Zip codes which also had an acceptable city were deemed multicity, and eliminated.

[4] Fees are distinguishable from taxes insofar as they are voluntary. On the other hand, since businesses must pay them to engage in their regular activities, the impacts of fees are much the same as taxes.

[5] There were 19,519 incorporated municipalities and 16,360 townships in this data source.

[6] Business taxes/licenses/fees are (using the Census categories): Amusement License, Corporation License, Public Utility License, Occupancy and Business Licenses NEC, Corporate Net Income Tax, Severance Tax, Alcoholic Beverage License, Other License Taxes, and Taxes NEC (which on investigation of city financials turned

Bureau of Economic Analysis (BEA). This measure is similar to the one used by Wheaton (1983) to derive effective business tax rates at the state level. As alternative measures, we can divide business taxes/fees by the number of business establishments in the state (derived from Census' *County Business Patterns*), divide business taxes/fees by total tax collections for each city, or divide such taxes by city population. For 2003-11, average rates were 8.835% as a percent of total city taxes, and 3.947% as a percent of business incomes. Since state corporate income tax rates average below 7%, these numbers are significant.

It is important to note that the foregoing business tax/license/fee measures exclude two potentially significant taxes--property and sales--which given the aggregate nature of data reported, we cannot reliably apportion to the business sector versus the individual sector.[7] On the other hand, we can *estimate* the economic impacts of property and sales taxes econometrically, as discussed later.

3.2. Alternative Measures of Business Taxes

Examining the impact of taxes on business activity by using overall tax rates might be theoretically preferable to using statutory rates. However, such overall rates use business activity as a divisor, so regressing business activity on these rates creates an artificially negative relationship between it and any dependent variable based on business activity. Moreover, there is a potential endogeneity problem; it may be that cities adjust their tax/license/fee rates in response to business activity. For example, cities experiencing lagging business growth may lower rates; conversely, cities with a healthy and growing business sector may increase business taxes in times of revenue needs. I address this with two alternative measures of business tax. The first is to examine the *existence of a city business tax structure (including an income tax)* based on *activity*. Although the rates at which such taxes are imposed can fluctuate to some degree, their existence tends to stable over time. In fact, for the over 800 cities examined here, the existence of such taxes changed for very few of the cities over the time period examined. Thus, if we measure the existence of such taxes in the form of a dummy variable, it is arguable that there is no endogeneity with this variable and observed business activity.

This variable is not reported in any comprehensive data source.[8] Instead, individual city web sites were examined as portals to further information as to city business tax structures. Information on such structures were contained in "doing business" sections of the websites, and further research eventually led to actual laws themselves. To see if such structures changed, actual city laws were examined. This was a very labor-intensive task made slightly easier by: 1. not examining changes in rates per se across time, and instead focusing on whether a tax existed and its general structure; and 2. focusing on cities having populations of over 40 thousand (as of 2010). Although such rates did change somewhat, tax structures—whether a tax existed, and if so, whether it was based on gross receipts, employees/payroll, square footage, or a flat fee, rarely changed.[9] Here, we can assign a dummy variable set to one if a city has any tax at all, and if such a tax exists, we can assign a series of dummy variables based on the type of tax. Such dummy variables do not indicate whether the city imposes other taxes, fees, or licenses, and as such measures only the presence or absence of a general business tax based on economic activity (including an income tax). However, the general business tax typically accounts for over half of the total business taxes imposed by cities (excluding property and sales taxes), and is easily the most visible tax to businesses.

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out to be business taxes and fees). Although businesses also pay property and sales taxes, the aggregate data reported by Census does not break these taxes out into those paid by businesses versus individuals. Note that because the publicly-available Census dataset is aggregated at the state level, I requested and received under the Freedom of Information Act (FOI) detailed data for all sub-state governments.

[7] The magnitudes of property and sales tax collections are significant, averaging 46.7 percent and 24.2 percent, respectively, of city tax collections.

[8] Even on-line tax research databases provided by Commerce Clearing House (CCH), RIA, etc., only provide business tax information for certain large cities.

[9] I examined city charters/legislation/constitutions for as far back as was available to look for any structural changes. For many cities, such structural change required a major change to its city laws requiring legislative approval—certainly not an easy legislative task, especially compared to simple rate changes. One notable such change was for San Francisco which phased in a gross receipts tax (from an employee-based tax) starting in 2011.

The second approach is to attempt to measure overall business taxes in a way which might not be mechanically related to any dependent variable, nor be endogenous to it. Here, I develop a business tax rate where overall business taxes are divided by city population. Next, I take the average of this rate over the twelve years examined here. Finally, I categorize such rates into quartiles. Thus, the measure broadly characterizes cities into very low to high tax categories. Here, we may be able to quantify tax effects more generally, without the potential of mechanical/endogenous relations ships to economic activity variables used as dependent variables in regressions.[10]

3.3. Model and Control Variables

In examining whether city taxes have an economic impact, we of course want to control for trends and potentially unobserved variables that could affect business activity. We can attempt to control for such trending and other effects with a fixed effects regression specification as follows:

$$Z_{it} = \alpha_i + \mu_t + \gamma_s + \lambda_c + \delta_1 BT_{i,t} + \delta_1 NEARBY_t + \sum_i \phi_{i,t-1} + \varepsilon_{i,t} \qquad (1)$$

Where $Z_{it}=(Y_{it}-Y_{it-1})/(Y_{it-1})$, and Y_i is employment (or the number of establishments) for zip code i in year t, BT is a vector of dummy variables set to 1 for existence of city business tax structures (or levels of overall business taxes)[11], in zip code i in year t (and 0 otherwise), and μ_t , γ_s and λ_c are fixed effects for year, state, and county (a series of dummy variables). In this specification, the dependent viable is the percent change in employment (or establishments), which has the effect of controlling for size effects.

The $\sum_i \phi_{it}$ term represents control variables from Census (lagged by one year). These include the log of population; the log of personal income; and non debt-service city expenditures per capita[12]. The latter is intended to proxy for the level of services that a city offers.[13] Unfortunately, given the level of data publicly available which would cover all cities in the sample, I cannot reliably separate such services into those which would strictly benefit businesses (or their owners). The *NEARBY* variable indicates that there are nearby zip codes which have no taxes (i.e., it is in a different city, and that city has no taxes on business activity). The idea is that where a nearby location has a favorable tax structure and is reasonably close, this gives that location a comparative disadvantage (or at least no disadvantage, if it is in a city with no tax). See Goolsbee and Maydew (2000) who find that nearby favorably-taxed states have an effect on state employment, and Holmes (1998) who examines similar state border effects in the case of adjoining states which have (or do not have) "right to work" laws. Although there is no known database to show which zip codes are closest to city borders (zip codes, as well as cities, have very irregular borders), we can estimate which such zips are in fact border areas, by examining distances between any two pairs of zip codes[14]; distances between all pairs of zip codes within ten digits of each other were then calculated, and if the adjacent ZIP

[10] Other jurisdictions besides cities (counties, school districts, etc.) can impose taxes on businesses. Since the purpose here is to examine whether cities' tax policies have an effect on economic activity, these taxes might be properly be included as control variables here. Unfortunately, the only source of such data is collected and calculated by the Lincoln Land Institute, which gathers such data for only the largest 150 cities. See http://www.lincolninst.edu/subcenters/fiscally-standardized-cities.

[11] These are not lagged since they are constants across time, with a few exceptions. See discussion in text on how the BT variables are measured.

[12] See for examples of control variables used in state tax based studies. Unfortunately, regularly-collected variables at the city level are less common. For example, educational attainment, age, etc. are infrequently collected by Census. With regard to industry dummies, Census only reports broad employment ranges by NAICS codes which provides for very noisy measures of employment.

[13] See Gabe and Bell (2004).

[14]The distance between any two pairs of zip codes can be calculated based on latitude and longitude data reported by the U.S. Post Office (USPO) data base of zip codes. This data reports latitude and longitude for the centroid of every U.S. zip code. For any two such data points, we use the following formula (from any standard geography text): distance=ACOS (SIN(Lat1)*SIN(Lat2)+COS(Lat1)*COS(Lat2)*COS(Lon2-Lon1))*3443.89849, where latitude and longitude data is degree and minute data reported by the USPO and is converted into radians using the formula: radians= ((Degrees*3600+Minutes*60+Seconds)/3600).

was in a different city and had no business tax, this was scored a "1" (and zero otherwise). Next, the average distance to such adjacent cities was then multiplied by the dummy variable to obtain a composite score based on distance and tax structure. Essentially a higher score indicated that the ZIP was further away from a nearby city (or cities) with no business tax, which gave it an advantage. Although scores varied widely, in many cases this ten ZIP code "circle" encompassed entire metro areas for smaller and medium sized cities.

Table-1. Correlations between variables (averages for 1998-2011)

	Establish-ments (%Δ)	**Employment (%Δ)**	**City Tax**	**City Flat Tax**	**City Gross Receipts Tax**	**City Employment Tax**	**City Square Footage Tax**	**City Income tax**
Establishments (%Δ)	1.00	.531	-.010	-.002	-.009	-.016	-.009	-.016
Employment (%Δ)		1.00	-.013	-.002	-.011	-.001	-.012	-.002
City Tax			1.00	.308	.615	.007	.248	.148
City Flat Tax				1.00	.344	.026	.140	-.007
City Gross Receipts Tax					1.00	.001	.147	-.009
City Employment Tax						1.00	-.029	.054
City Square Footage Tax							1.00	.194
City Income tax								1.00

	Population (ln)	**Growth in ln city personal income**	**City per capita expenditures (non-debt)**	**Business Tax Rate (2nd quartile)**	**Business Tax Rate (3rd quartile)**	**Business Tax Rate (4th quartile)**
Establishments (%Δ)	.0274	.0768	.0125	-.0513	.0307	-.0204
Employment (%Δ)	-.0001	.1252	.0223	-.0321	.0201	-.0038
City Tax	.0681	-.0295	.0682	-.1229	.1031	.1556
City Flat Tax	-.1248	.0142	.0314	.0215	.0189	.0373
City Gross Receipts Tax	.0163	.0152	.0212	-.1070	.1450	.0853
City Employment Tax	.1079	-.0212	.0870	-.1222	-.1222	-.1222
City Square Footage Tax	-.0597	.0035	.0351	.0119	.1101	.0542
City Income tax	.0681	-.0295	.0682	-.1229	.1031	.1556
Population (ln)	1.00	-.0426	.2160	-.0278	.0236	.0669
Growth in ln city personal income		1.00	-.0088	-.0241	.0177	-.0069
City per capita expenditures (non-debt)			1.00	-.1207	.0692	.4455

Note: all variables except Establishments (%Δ) and Employment (%Δ) are at *t-1*. Establishments (%Δ), Employment (%Δ), and distances are at ZIP code level; all other variables are at city level.

Descriptive statistics for business taxes are as follows. Approximately 57 percent of cities (54.3 percent of zip codes) have some sort of business tax based on economic activity. 11.2 percent (9.7 percent) of cities (zip codes) have a flat tax; 30.4 percent (28.4 percent) of cities (zip codes) have tax on gross receipts; 20.1 percent (17.6 percent) of cities (zip codes) have tax on employees or payroll; 6.5 percent (4.6 percent) of cities (zip codes) have tax on square footage; and 3.9 percent (6.9 percent) of cities (zip codes) have tax on profits. The components sum to more than the total percent with taxes since some cities have multi-attribute taxes (e.g., taxes for some cities based on employees, gross receipts, flat tax, etc. depending on industry). 80.3 percent of cities require business licenses, and any city with a business tax also has a licensing requirement. City (zip code) mean employment was approximately 75 thousand

(7400), and city (zip code) number of establishments was approximately 16 thousand (423). Correlations between the variables are shown in Table 1.

4. RESULTS

Before discussing the econometric results, it is instructive to discuss the effects of business taxes. Such taxes are expected to have cash flow and a "behavioral" effects. The former means that the tax—in any form assessed—reduces cash available to the firm for investment and, in the case of firms at the edge, exit from the market. The behavioral effect assumes that firms are cognizant of the tax and act accordingly in terms of expansion, location choices, etc. The behavioral effects resulting from different forms of taxation might be expected to vary. For example, a tax on employees/payroll increases the cost of labor which may cause less employment. Tax on square footage is essentially a tax on capital, which may cause downsizing of facilities. Flat taxes, and taxes on gross receipts or net income have no such obvious factor choice effects. Since our outcome variables here are employment and number of establishments, clearly a tax on employment/payroll should reduce employment. Other forms of tax may have an employment-reducing effect indirectly due to lower cash available to pay employees, or due to decisions to locate in a lower-taxed city. With regard to effects on the number of establishments, clearly taxes on factors of production (employees/payroll, or square footage) induce economic inefficiencies which can exacerbate profitability/cash flow effects of taxes and lead to firms avoiding/exiting the city, or failing altogether. Also, firms making location choice decisions may avoid creating an establishment in taxed cities (due to cash flow effects) in favor of a nearby city with no such taxes.

Table 2 shows regression results at the ZIP code level for the growth in establishments for three specifications of the model in (1). Standard errors are corrected for heteroscedasticity using the Huber-White fixup, and Durbin Watson statistics indicate no effects of serial correlation in the error terms. Eigenvalue analyses (supported by correlation statistics shown in Table 1) indicated no multicolinearity issues.[15] All specifications show that control variables have the expected signs and are statistically significant, including the *NEARBY* variable. All models show a statistically significant reduction in establishment growth as a result of business taxes. The first specification has a single dummy variable for existence of a city business tax; the second breaks the single tax variable out into flat taxes, net income taxes, and taxes based on gross receipts, employment/payroll, and square footage; and the third uses the overall effective business tax rate variable.

All specifications show that control variables have the expected signs and are statistically significant, including the *NEARBY* variable. All models show a statistically significant reduction in establishment growth as a result of business taxes. Model 1 shows that existence of a business tax reduces growth rates in establishments by .3%, and this effect is significant at .001. Model 2 shows that tax structures based on gross receipts, employment, and income all reduce establishment growths, all significant at .001. The average of the effects of these three taxes is also about .3%. On the other hand, taxes based on square footage or flat rates have no effect.

Model 3, which uses an overall effective tax rate broken into splines, shows statistically significant effects for the lowest and highest levels of tax. When a city's average effective rate goes from the lowest level to the next highest level, growth in establishments declines by 20%. At the highest level of effective rate, establishment growth rates were approximately .8% lower.[16]

[15] In particular, removal of the city expenditures (sans debt payments) variable had no qualitative effects on the regressions. This is important due to the potential for this variable to be endogenously related to business tax levels.

[16] To avoid perfect collinearity the omitted group is the lowest level of tax.

Table-2. Regression results, growth in establishments, 1999-2010

	(1)	(2)	(3)
Intercept	-.01146*** (.00292)	-.01181*** (.00297)	-.01352*** (.00290)
City business tax dummy variable *(t-1)*	-.00348*** (.00079)		
City flat tax dummy variable *(t-1)*		.00049 (.00094)	
City gross receipts tax dummy variable *(t-1)*		-.00388*** (.00074)	
City employee tax dummy variable *(t-1)*		-.00168*** (.00074)	
City square footage tax dummy variable *(t-1)*		.00281 (.00165)	
City income tax dummy variable *(t-1)*		-.00426*** (.00112)	
Average distance to nearest ZIP code in another city having no business tax	.0000003*** (.000001)	0000003*** (.000001)	0000002*** (.000001)
ln (city population) *(t-1)*	.00063*** (.00019)	.00069)*** (.00019)	.00059*** (.00019)
Growth in ln city personal income *(t-1)*	.08141*** (.00683)	.08217*** (.00684)	.08091*** (.00683)
City per capita expenditures (non-debt) *(t-1)*	.00033*** (.00015)	.00041*** (.00016)	.00033** (.00017)
City business tax rate (2nd quartile spline)			-.19767*** (.05301)
City business tax rate (3rd quartile spline)			.01681 (.02206)
City business tax rate (4th quartile spline)			-.00818*** (.00299)
Year, county and state fixed effects	yes	yes	yes
Number of observations	23789	23789	23789
F	56.79***	53.59***	55.07***
Adj. R^2	.1234	.1240	.1235
DW statistic	1.807	1.809	1.807

***significant at .01 ** significant at .05 *significant at .1 Standard errors (in parentheses) corrected using Huber-White fixup for heteroscedasticity. Business tax rates are averages over 1998-2010. Establishments and distances are at ZIP code level; all other variables are at city level.

Table 3 shows regression results at the ZIP code level for the growth in employment for three specifications of the model in (1). Standard errors are corrected for heteroscedasticity using the Huber-White fixup, and Durbin Watson statistics indicate no effects of serial correlation in the error terms. As with the establishment regressions, the first specification has a single dummy variable for existence of a city business tax; the second breaks the single tax variable out into flat taxes, net income taxes, and taxes based on gross receipts, employment/payroll, and square footage; and the third uses the overall effective business tax rate variable. All specifications show that control variables have the expected signs and are statistically significant, including the *NEARBY* variable. Similar to the establishment regressions, all models show a statistically significant reduction in establishment growth as a result of business taxes. Model 1 shows that existence of a business tax reduces growth rates in employment by .2%, and this effect is significant at .001. Model 2 shows that tax structures based on gross receipts and employment reduce employment growth, and the average of the effects of these taxes is also about .2%. On the other hand, taxes based on square footage or flat rates have no effect. Income taxes have a negative coefficient but it is not statistically significant. Model 3, which uses an overall effective tax rate broken into splines, shows statistically significant effects for the lowest and highest levels of tax. When a city's average effective rate goes from the lowest level to the

next highest level, growth in employment declines by 20%. At the highest level of effective rate, employment growth rates were approximately .7% lower.[17]

Table-3. Regression results, growth in employment, 1999-2010

	(1)	(2)	(3)
Intercept	-0.00792*** (0.00194)	-.00709*** (.00196)	-.00938*** (.00176)
City business tax dummy variable *(t-1)*	-0.00186* (0.00113)		
City flat tax dummy variable *(t-1)*		.00029 (.00134)	
City gross receipts tax dummy variable *(t-1)*		-.00282*** (.00106)	
City employee tax dummy variable *(t-1)*		-.00166* (.00109)	
City square footage tax dummy variable *(t-1)*		.00339 (.00192)	
City income tax dummy variable *(t-1)*		-.00130 (.00170)	
Average distance to nearest ZIP code in another city having no business tax	.0000003*** (.000001)	.0000002* (.000001)	.0000002* (.000001)
ln (city population) *(t-1)*	.08922*** (.00684)	.08023*** (.00705)	.08948*** (.00692)
Growth in ln city personal income *(t-1)*	.26232*** (.00998)	.26286*** (.00999)	.26174*** (.00999)
City per capita expenditures (non-debt) *(t-1)*	.00097*** (.00022)	.00099*** (.00023)	.00094*** (.00024)
City business tax rate (2nd quartile spline)			-.20251*** (.07840)
City business tax rate (3rd quartile spline)			.02013 (.03184)
City business tax rate (4th quartile spline)			-.00745** (.00395)
Year, county, and state fixed effects	yes	yes	yes
Number of observations	23793	23793	23793
F	46.95***	44.07***	45.58***
Adj. R²	.1023	.1024	.1026
DW statistic	2.007	2.008	2.008

***significant at .0 1 ** significant at .05 *significant at .1 Standard errors (in parentheses) corrected using Huber-White fixup for heteroscedasticity. Business tax rates are averages over 1998-2010. Employment and distances are at ZIP code level; all other variables are at city level.

Overall, findings suggest that city business taxes do have a negative impact on the number of establishments and employment in a city. This effect is consistently negative for cities with taxes on employment/payroll and on gross receipts. However, the estimated impacts are economically small. For example, averaging across Table 2 and 3 coefficients, existence of a business tax reduces the number establishments by .3 percent, and employment by .2 percent. For an average city of 75 thousand employees, this implies that presence of a city tax costs about 150 jobs. For a larger city of 1 million employees, this would be approximately 2000 jobs. Because of the spline nature of the measure used here, estimating the effects of overall business tax rates is more complex. However, because we observe the strongest effects at the lower levels of tax (i.e., when we go from an almost negligible level to a low level), one possibility is that existence of taxes signals a lack of business-friendliness.

[17] Untabulated similar results occur for all regressions when establishment and employment is at the aggregate city level, although the power of such tests is slightly lower due to less observations. There are 18,864 "cities" in the data base, and 41,898 zip codes, so on average, each city has approximately 2.25 zip codes. Of course, this is just an average, and is influenced by many small cities. Larger cities have more (in our 803 cities having over 40,000 populations, these cities average about 10 zip codes each).

Overall, we also see consistently negative impacts on establishments and employment the farther away we go from bordering (competing) cities with a favorable tax structure (e.g., no taxes on business). The effects of nearby cities is broadly consistent with those of Holmes (1998) finding that bordering states' right to work laws affected business growth, and Chrinko and Wilson (2008) finding of zero-sum investments across states (using matched counties) due to state corporate tax structures.

4.1. Diagnostic Analysis

Potential effects of local sales and property taxes, and endogeneity, using a sample state Cities impose sales and property taxes on businesses, neither of which were included in the regressions. The foregoing regressions, using fixed effects for year, county, and state, attempts to control for such omitted variables, but it is possible that the omission of these two taxes, despite fixed effects, bias the business tax rate coefficient. The salience to businesses of sales taxes is unknown; businesses pay them on certain purchases, although if the purchased items are resold or are otherwise part of a resold product, there is no tax. Moreover, some states do not impose a sales tax (Alaska, Delaware, Montana, New Hampshire, and Oregon), and while such taxes typically add a county component to the state rate, not all cities add their own tax.[18] As with sales taxes, the salience of property taxes to business is unknown; such taxes are imposed on business personalty (equipment, furniture and fixtures, etc.) which at higher levels may be a disincentive. Higher real estate tax rates may discourage commercial construction. For leased commercial/industrial properties, an incidence identification problem may occur for property taxes; in theory they are in part passed onto local business tenants through higher rents, but they may also end up being borne by real estate owners who are located outside of the city.

Since the only state for which I have tax *rate* data is California, I perform an analysis using this state.[19] To address potential endogeneity issues, I first construct instrumental variables for sales and property tax rates then run the regressions.[20] Regression results after these IV measures are shown in Panel B of Appendix Table A1. Neither the sales tax nor the property tax IVs have statistically-significant impacts on establishments or employment, and the business tax coefficients are negative and generally similar to those reported in Tables 3 and 4.

[18] Certain states do not follow the "home rule" concept and prohibit cities from imposing certain types of their own taxes.

[19] The only commercially-available database of sales and property tax rates by city, on a time series basis, is the Kosmont-Rose Institute *Cost of Doing Business Survey* (available at Roseinstitute.org), published annually by the Rose Institute at Claremont-McKenna College. This report is an annual survey of all California cities that collects data on taxes imposed by the city at a fairly specific level, tax and non-tax incentives offered, and certain other data that might be useful to a business considering locating to a particular city. It is the only time series database of such specific tax and incentive data at the municipal level. However, except for one year, the *Survey* collected data only for California cities; accordingly I can perform tests of sales and property taxes using only California cities. Using such data from 2000 through 2010, sales tax rates had a mean of 9.061%, with maximum (minimum) of 10.8% (6.7%). Property tax rates had a mean of 1.52%, with a maximum (minimum) of 5.61% (1.00%).

[20] It may be (due to budgetary considerations) cities adjust such rates in conjunction with business tax policy as part of an overall policy. To address the first problem I create instrumental variables (IVs) from sales and property tax rates, from regressions creating predicted values of both which use variables not correlated with other variables in the business tax rate regressions. Following Luna, Bruce and Hawkins (2007). who examine cities in Tennessee, I model sales tax rates for city *i* at time *t* as a function of sales tax capacity, sales tax effort, expenditures per capita (lagged), and population growth. Tax capacity is the city's ability to raise taxes compared to other cities in the same state, which is the city's tax base (from Census data) times the average state sales tax rate, divided by the state average of the same number. Tax effort is the intensity with which the city taxes the base, and is calculated as the tax rate for city *i* in year *t* divided by the average for its state in the same period. The regression also includes expenditures per capita and population growth (both from Census data), which proxy for revenue needs. In the same spirit, I model property tax rates as functions of property tax capacity, property tax effort, expenditures per capita (lagged), and population growth, where tax capacity and tax effort are measured similarly to their sales tax counterparts (except with property tax data) and are derived from Census and Kosmont-Rose data. I orthogonolize the IVs from these first stage regressions by regressing the property tax IV on the sales tax IV and the business tax rate variable, and use the residual from this second stage regression as the final IV for property tax rates. Similarly, I regress the sales tax IV on the business tax variable and use the residual as the final IV for sales tax rates.

An additional issue relates to the potential endogeneity of business taxes and economic activity. That is, do cities decide to have (or continue) a business tax in light of existing business activity? If this is the case, such endogeneity clearly violates the conditional independence assumption (CIA) and the regression assumption that error terms are uncorrelated with regressors. I argue that this is not an issue for several reasons. First, none of the cities in the time period changed whether they *had* a business tax, so it appears the decision to have a tax was not responsive to business activity. Second, I run a test suggested by Woolridge (2002) regressing the future business tax variable on previous year levels of employment and number of establishments. The coefficients here were not significant. While there may still be some level of endogeneity, this does suggest that issues related to reverse causality are not biasing the slope coefficients in the model. Finally, I run a policy probit analysis examining the impact of variables potentially explaining the presence of a business tax for cities in California.[21] Results show that only effects of nearby cities are significant, which suggests that common observable factors[22] do not seem to have much relationship to the decision to have a city business tax, and accordingly, endogeneity of the tax appears not too problematic here.

Although only one state, the above analyses are nonetheless instructive since California contains about 15% of the cities in this paper's sample, with a wide variety of city sizes and tax structures.

5. DISCUSSION AND CONCLUSION

There is little research on whether *municipal* level tax policy can attract or repel business in U.S. cities. Although such taxes are perceived as small relative to state and Federal taxes and therefore unimportant at the margin to decision makers, because adjoining municipalities are often very similar in terms of markets and infrastructure, differences in tax structures might be salient. This study first documents municipal business taxes, licenses, and fees across the United States, and finds they are a relatively significant cost to business. Next, using very precise zip code level data across all states over a long time period, I find that activity-based city business taxes generally have a statistically significant negative impact on city employment and the number of establishments. This effect is most pronounced if the city has a tax on employment/payroll, or on gross receipts. I also find that if a city is bordered by other cities with more favorable tax structures (e.g., no taxes), there is a reduction in establishments and employment. Finally, control variables show that levels of city spending can create a more desirable location and thus have some countervailing effects on higher tax rates.

The policy implications are as follows. For many cities, much of their revenue sources are out of their control; sales and property tax revenues are remitted by counties, and such revenues are also at the mercy of economic fluctuations. Actual tax sources controlled by cities (excluding fees and fines) such as business taxes are relatively few,[23] so simply getting rid of business taxes is quite risky. While such taxes do have employment- and establishment-reducing effects, such effects are modest, so city decision-makers may consider such job losses acceptable in light of budget constraints with the potential for cuts in city services. Instead, reductions in rates of taxation may be a more reasonable choice. Also, decision-makers should consider the method of taxation; results shown here clearly indicate that taxes on employment/payroll and gross receipts have the clearest negative effects

[21] Since I only have sales and property tax rates for California (see discussion above), the analysis is based on that state.

[22] I include revenue needs (current and lagged city total expenditures, CTE, from the aforementioned Census data), alternative sources of revenues (sales tax, STR, and personal property tax rates, PTR), growth in state personal incomes (STPIRG current and lagged, also from Census data), as well as effects of nearby cities (i.e., whether the city would chose to have a business tax in light of competition for business, where DIST=distance in miles between city centers). The probit estimate is (standard errors in parentheses): BUS TAX= .9776(.2314)-.1128DIST(.0164)+ 1171(.0165)DIST*TAX + .0002(.0010)$STPIGR_t$+.0017(.0011)$STPIGR_{t-1}$+ .0156(.0217)STR_t+.0056(.0141)STR_{t-1}-.0767(1125)PTR_t -.1267(.0817)PTR_{t-1}-.0124(.080)CTE_t+.0089(.053)CTE_{t-1}, n=3987, *F*=203.97, time period=1998-2011.

[23] In my examination of census data and city budgets, I found that an increasing number of cities are generating own-source revenues through hotel occupancy taxes. Here, hotels charge guests a city tax. This tax may be relatively politically palatable insofar as hotel guests from outside the city cannot vote to reduce to get rid of such a tax.

on business. In contrast, flat taxes have no clear negative effects; cities may wish to utilize these, perhaps with some general levels of tax based on broad size categories. Finally, to the extent overall local tax rates reflect incentives, the results here are suggestive as to the efficacy of such incentives (see Bartik (2005) who points out a dearth of research in this area).

One limitation of this study is not controlling for the potential effects of tax shifting.[24] That is, firms may be able to shift some of business taxes forward to consumers or backward to labor. Of course, this ability depends on market structure, e.g., firms operating in perfectly competitive markets would have only limited ability to shift. Unfortunately, data on prices at the city level is limited so such tests do not appear feasible here.

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[24] For a review of the literature on tax shifting, see Gravelle (2010).

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APPENDIX

Table A1. Two stage least squares regression results for cities with effects of sales tax and property tax rates (California, 2000-2011)

Panel A— stage 1: generating IVs for sales and property tax rates

	Sales tax rate (1)	**Property tax rate (2)**
Intercept	9.372*** (.245)	1.126*** (.066)
Sales tax capacity	.898*** (.092)	
Sales tax effort	.999*** (.105)	
Property tax capacity		.897*** (.083)
Property tax effort		.997*** (.112)
Ln city expenditures (*t-1*)	.035* (.016)	.039*** (.006)
Ln Population	-.056*** (.017)	-.048*** (.007)
Number of observations	3987	3987
F	3.58**	30.02***

Panel B— stage 2: DID regressions for business tax, sales and property tax IVs included

	***Ln* Establishments**		***Ln* Employment**	
	(3)	(4)	(5)	(6)
Intercept	.0545315 (.108926)	.0005773 (.256227)	.0472639 (.115020)	-.0990857 (.3077666)
Business tax dummy variable	-.015318* (.007477)	-.0161928* (.0076214)	-.0027861 (.0262916)	-.0031496 (.0264104)
Sales tax IV		.00759466 (.0265153)		.01661404 (.0325346)
Property tax IV		-.0111773 (.0322552)		-.00058963 (.0349494)
County fixed effects	Yes	Yes	Yes	Yes
Number of observations	9582	9582	8119	8119
F	2.31***	2.25***	2.10***	1.99***

***significant at .001 ** significant at .05. Data aggregated at city level for stage 1 regressions. There are 33 counties. Sales tax rates have a mean of 9.061%, with maximum (minimum) of 10.81% (5.77%). Property tax rates have a mean of 1.52%, with a maximum (minimum) of 5.61% (1.00%).