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The Reform of Business Property Tax in Ontario: An Evaluation

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The reform of business property tax in Ontario: An evaluation

Michael Smart

Abstract

Business property taxes in Ontario have fallen dramatically in the past decade, due to a series of reforms mandated by the provincial government. In this paper, I discuss the likely impacts of the reforms on business location, wages, and land values, and the economic welfare of provincial residents. I use the reforms to estimate the responsiveness of business location and employment to local tax differentials. The reforms have caused a large shift in legal tax burdens from businesses to residents, particularly in Toronto and a few other cities. Based on my analysis, I conclude that the tax reform has had a small positive impact on employment in cities and on business productivity in Ontario.

Key words: business taxes, business location, intermunicipal competition
JEL codes: H25, R33

The Reform of Business Property Tax in Ontario: An Evaluation

I. Introduction

In the past decade, the province of Ontario has been engaged in a substantial reform of business property taxation. By a conservative estimate, explained below, the reform has reduced taxes paid on commercial and industrial properties by about \$2 billion per year. Arguably, the reform has caused a large shift in tax burdens from business to residential ratepayers, and it has contributed to the current fiscal pressures facing Toronto and other Ontario municipal governments. In spite of the magnitude and importance of the reform, it has not (to my knowledge) been subject to a cost-benefit evaluation. This paper takes some first steps in that direction.

As the tax reductions since 2001 have been large, so the initial tax rates prevailing in 2001 were high. Moreover, tax rates at the time differed substantially between neighbouring jurisdictions. As a notorious example, taxes on industrial properties in the City of Toronto were levied in 2001 at 9.9 percent of assessed value, compared to 4.8 percent in the neighbouring City of Mississauga. This pattern, repeated elsewhere in core and suburban cities and for commercial as well as industrial properties, has given rise to concerns that taxes are discouraging investment in non-residential structures, and affecting business location and employment decisions. Tax differentials between core cities and suburbs are thought to be one factor contributing to the “suburbanization of employment” in metropolitan areas (Heisz and LaRochelle-Côté 2005), the loss of large industrial employers in central cities (Slack 2003), and the observed preference of the market for residential over new office developments in the City of Toronto in particular (Canadian Urban Institute 2011).

The economic effects of the business property tax depend on its economic incidence: that is, whether the tax is ultimately paid by businesses occupying land in high-tax cities, or whether it is shifted through price changes to workers, owners of land, or other factors of production. In the standard economic views of the property tax, it is ultimately either a tax on capital employed in residential and non-residential structures, or it is a tax on local land values. These are known as the “capital tax view” and “benefit tax view” of the property tax, respectively.

If the former view is correct, then property taxes (particularly those on business properties) create high economic costs by discouraging investment, distorting location, and reducing productivity, and there is a strong case for reforms to reduce business taxes to the same rates as for residential properties, or even to lower rates. If the latter view is correct, then the property tax is an efficient means of raising revenue for local governments, and high rates of business taxation are no cause for concern—even if rates differ between neighbouring locations. While the empirical evidence on property tax incidence is mixed, there is evidence that a considerable proportion of the property tax is capitalized into local land values.

In this paper, I review these arguments in detail and survey previous economic research on business property taxation. I then evaluate the effects of business property taxes in Ontario, based on information on the location of business establishments and employment and how it has changed since the tax reforms began a decade ago. Provincial policies since 2001 have mandated a shift in tax burdens from business to residential properties. Important for my empirical approach, the mandate applies in municipalities and property classes with relative business tax burdens (“tax ratios”) above the provincial average, but not in those with tax ratios below the average. The reform therefore has tended to reduce tax differentials among neighbouring municipalities, as well as reducing taxes overall, and it has done so in a way that is independent of other factors that may simultaneously be influencing economic development and tax policies at the local level.

In brief, I find that the reform has induced a small but significant shift in business location and employment to the capped municipalities, with the gains coming mainly at the expense of neighbouring, uncapped municipalities. Based on my results, I draw conclusions about the mobility of businesses; the effects of local taxes on productivity, wages, and local land values; and the desirability of the provincial tax reforms more generally.

The plan of the paper is as follows. Section 2 reviews the previous literature on the economic effects of local property taxes. Section 3 describes local business tax policies in Ontario, the reforms that have taken place since 2001, and the patterns of employment and business location over the same period. Section 4 presents the main empirical analysis, which uses the provincial reform to estimate the responsiveness of business location, employment, and earnings to local tax differentials. Section 5 concludes the paper.

2. The economic incidence of the property tax

Business property taxes in Ontario are high and vary widely between locations, even within metropolitan areas. Provincially mandated reforms of the past decade have, however, resulted in large-scale reductions in taxes. Evaluating the effects of these tax changes requires an understanding of the economic incidence of property taxes. The property tax is a particularly complicated tax to analyze, because it applies to both land and structures (two factors of production that are economically very different), and because tax rates vary at the local level, and economies of neighbouring cities are economically interconnected.

Two standard views of property tax incidence are advanced in the economic literature: the “capital tax view” and the “benefit tax view.” Proponents of the “capital tax view” see the local property tax as primarily a tax on capital investments that distorts investment in structures and the location decisions of both residents and businesses. When a single community raises its property tax, investment in structures declines, and capital and employment move to other jurisdictions. In the simplest version of the theory (Zodrow and Mieszkowski 1986), the outflow of capital causes a decline in local land values and (in the case of the business property tax) a decline in local wages, which are roughly offset by

increases in land values and wages in other jurisdictions. The capital tax view sees the property tax as a tax on structures, and it largely ignores land.

In contrast, Hamilton (1975) promulgated the “benefit tax view,” arguing that municipalities can effectively use zoning restrictions (such as minimum lot sizes for houses) to limit the distortionary effects of property taxes on housing investment. With binding zoning restrictions, residents cannot respond to the property tax by reducing investment. In the absence of an investment effect, property tax increases should be capitalized into the market value of land in the taxing municipality, resulting in an efficient lump-sum tax on land.

Extending this logic, Fischel (1976) noted that rigid zoning of municipal land into areas for commercial, industrial, and residential uses likewise causes the business property tax to be capitalized into land values. With full capitalization, city residents cannot use the business property tax to shift tax burdens to outsiders, and competition between municipalities should drive business tax rates down to a level that equals to cost of supplying local public services to business (plus the costs of congestion and nuisances caused by business to residents). The property tax therefore acts as a user fee, or benefit tax, for local public services. If property taxes are benefit taxes, then they are a “price of entry” that does not distort business location decisions, even in the presence of substantial tax differentials among municipalities.

In short, the capital tax view sees the property tax as a tax mainly borne by capital. Since capital is mobile, tax differentials (that are not offset by service differentials) cause changes in the location that reduce productivity. The benefit tax view sees property tax and service differentials as capitalized into local land values. Since land is immobile, the tax is not distortionary. On the other hand, since capitalization effects are borne by local landowners, municipal governments will not choose rates of business property taxation in excess of the marginal cost of providing public services to business.

2.1 Empirical studies

The stark contrasts between the capital tax and benefit tax views have led empirical researchers to investigate the sensitivity of business locations to taxes on the one hand, and the degree of capitalization into land values on the other. The empirical literature is large and diverse, and it is difficult to draw definitive conclusions.

Numerous studies since Oates (1969) have found persuasive evidence that tax and public service differentials are largely capitalized into land values. But, as Zodrow (2007) and others have observed, the implications of this finding are unclear. Capitalization can still occur in the presence of distortionary effects on investment, and so capitalization is not inconsistent per se with the capital tax view. Conversely, a strict reading of the benefit tax view suggests tax differences should not be reflected in private tax values in equilibrium, because they will be offset by differences in local public services.

The literature on business location and property taxes is comparatively sparse. Much of the earlier work, summarized for example by Bartik (1991), uses state-

level data and state-level differences in business income and average property taxes. (Bartik's own earlier [1985] research on plant location at the state level found no effects of property taxes.) Oates and Schwab (1997) examined a property tax reform in Pittsburgh that shifted the statutory tax burden from structures to land, and did find effects on local investment, but inferring the effects of a combined tax on land and structures is difficult. Haughwout et al. (2004) examined the response of revenues to changes in local taxes on property, employment, income, and sales, for four large U.S. cities. They found relatively large tax base elasticities in general. Lee and Wheaton (2010) found significant but "gradual" employment effects following increases in local business property tax rates in Massachusetts between 1980 and 2000. Working at a very fine level of geographic detail, Duranton et al. (2011) found a significant impact of local tax differences in the United Kingdom on the location of employment, but not of firms.

2.2 Tax competition and tax exporting

The two canonical views differ on tax incidence, but both have similar, and stark, predictions about the levels of business property taxation we should observe in a decentralized system of tax-setting. Zodrow and Mieszkowski (1986) emphasized that, under the capital tax view, competition between local governments should drive down property tax rates, as residents seek to avoid the deleterious effects of outmigration of capital.

Wilson (1985) was among the first to study a classified property tax in this context; his theory predicts that cities will set business tax rates lower than residential tax rates, because capital used in the production of traded goods is more responsive to tax differentials than capital used in the production of housing. As noted, under the benefit tax view, competition between municipalities should drive business tax rates down to the level of a user fee for public services consumed by business, leaving no room for fiscal burdens to be transferred from local residents through the tax system. Since the cost of public services to residents almost certainly exceeds the cost of public services to business, the prediction is that business taxes will be set at lower rates than residential taxes.

A broader perspective recognizes that local taxes may be shifted onto factors of production other than capital and land, so this dichotomy of views is somewhat artificial. Certain locations have natural advantages for production that are not capitalized into land values, so certain businesses may earn locational rents that accrue as pure profits. Likewise, local agglomeration economies can generate rents, which may bear some of the burden of elevated property tax rates. Finally, labour may be relatively immobile between metropolitan areas, but mobile between city and suburb within a single metropolis, as suburban residents commute to jobs in the core city. Thus business taxes may be borne by labour in the form of depressed wages, and part of the elevated tax burden in core cities may be "exported" to non-resident commuter-workers.

In short, neither canonical view can explain the high rates of business tax prevailing in Ontario's classified system, and neither provides a rationale for

provincial government intervention to lower local tax rates. In a broader perspective, if taxes are shifted to labour in metro area, or to locational rents, then tax burdens may be exported in part to non-residents. This fact may explain why businesses are generally taxed more than residents, not less, under classified property tax systems.

3. Taxation and business location: A first look

This section provides an overview of business property taxation in Ontario and the way it has changed over time, together with a first look at data on the location of business establishments and employment across municipalities.

The main data sources for the analysis are as follows. Data on municipal and provincial property tax rates, assessed property values, and revenues since 2001 are derived from municipalities' annual Financial Information Returns to the provincial Ontario Ministry of Municipal Affairs. Data on industry employment, earnings, population, and land area at the level of census subdivisions (i.e., municipalities) are available from the 2001 and 2006 Censuses of Population, published by Statistics Canada. Finally, counts of business establishments in various employment size ranges and industries are available from the Canadian Business Patterns data annually for the 2000 to 2008 period, produced by Statistics Canada based on administrative records from the federal Business Register. Summary statistics for the main variables used in the analysis are presented in the appendix.

Table 1 provides evidence on the pattern of business property tax rates in Ontario, and a preliminary indication of the nature of the reform. The table shows tax rates¹ in 2000 and in 2008, for the 12 urban "core" cities in southern Ontario² and the average of their five nearest neighbouring cities (the "suburbs").³

Business property tax rates in 2000 were extremely high, ranging from 4.32 percent of assessed value in Kingston to 7.69 percent in Toronto. Tax rates were generally higher in core cities than in their neighbouring suburban communities. This difference was particularly true for Toronto, whose neighbours levied, on average, a 4.12 percent tax rate, just over half the rate in the city of Toronto.⁴ The same pattern was seen, albeit to a lesser degree, in nearly all core cities.

1. The reported tax rates are the average of the statutory tax rates as a percentage of property values for the industrial, commercial, and large office building property classes. The averages are weighted by the 2000 shares of assessed property value in each municipality. The tax rates include city and county general tax rates, and provincial education tax rates.

2. These are the urban core cities of the Census Metropolitan Areas in southern Ontario, as defined by Statistics Canada, excluding the city of Barrie, which was quite small in 2000 and where subsequent development has been mainly residential.

3. I chose five neighbours for each city, rather than all contiguous neighbours, to avoid aggregation bias in what follows. But five neighbours matches well one's intuitive ideas of the suburbs. For Toronto, for example, the five closest neighbours are the cities of Vaughan, Markham, Richmond Hill, Mississauga, and Brampton.

4. Slack (2003) reports that Toronto's industrial and commercial tax rates were then higher than any city in North America, except Chicago.

Table 1: Average business tax rates in metropolitan areas

	Percent				\$millions
	Core city		Suburbs		Estimated revenue cost
	2000	2008	2000	2008	
Brantford	6.36	5.34	4.97	4.19	5.9
Guelph	5.39	4.52	4.49	3.64	6.0
Hamilton	5.41	4.27	4.31	3.27	43.0
Kingston	4.32	4.29	4.65	4.13	0.2
Kitchener	5.38	4.26	5.30	4.10	15.1
London	5.65	5.08	4.54	3.91	17.5
Oshawa	4.82	4.14	4.18	3.41	21.3
Ottawa	4.66	3.14	4.72	4.05	148.2
Peterborough	5.61	4.60	3.02	2.40	5.7
St. Catharines	5.14	4.20	5.21	4.28	9.9
Toronto	7.69	4.13	3.80	2.64	1,069.6
Windsor	5.51	5.14	3.76	3.28	13.0
Province Total	3.99	3.50			1,835.2

It is worthwhile emphasizing the magnitude of these tax rates and the inter-city differences. In particular:

- These averages mask even greater differences for individual property classes. For example, the tax rate for industrial properties in Toronto in 2000 was 9.9 percent, compared to an average of 4.4 percent for neighbouring cities.
- These are flow rates of tax on the stock value of properties: the corresponding tax rates expressed as a percentage of net rental values of properties were, based on standard discount rates, on the order of 50 percent or higher.
- The reported differences in business tax rates were not reflected in residential property tax differences. Residential tax rates were much more similar, and in some cases (notably Toronto) were lower in core cities than in suburbs. Thus core cities taxed businesses more than suburban municipalities did, even relative to residential tax rates.

The table also reports the corresponding tax rates for 2008, after the main effects of provincially mandated reforms had been implemented. (The mechanics of the reforms are described below.) Tax rates became much lower in both core cities and suburbs. Inter-city differentials also became smaller in some cases (again, notably in Toronto), but they have not been eliminated.

The reported drop in property tax rates as a percentage of property values tends to overestimate the true tax reduction, because property values were generally increasing at the same time. To get a sense of the change in tax paid for the average business property, I estimate the revenue forgone through the tax cuts by multiplying

the change in each tax rate during 2000–2008 by the city’s taxable assessment in each property class, and then summing over classes to get a city-level aggregate estimate. This is a “static” measure of revenue cost, which implicitly assumes that, if the tax reduction had not occurred, then the assessed tax base would have remained the same in real terms. It is almost certainly a conservative measure: property values have increased substantially in real terms in most core cities, even for residential properties that were unaffected by the reforms. Moreover, my estimate ignores the effect of new business property developments that increased the assessed tax base, which may have occurred for reasons unrelated to the tax reform.

The estimates are presented for the core cities, and the aggregate of all cities, in the final column of Table 1. (To avoid double counting, I report estimates only for core cities, and not their neighbours.) Revenues declined in all cities, but they are concentrated (in per-capita terms) in the traditional urban core cities of Toronto, Ottawa, Oshawa, Hamilton, and Windsor. In Toronto alone, the estimated revenue forgone is \$1.1 billion or about \$430 per resident. The aggregate for the province was over \$1.8 billion. Note that these amounts include reductions in provincial education taxes, which occurred in all municipalities but were also concentrated in core cities.⁵ The forgone municipal tax revenues is about half the total.

It is evident that revenue forgone does not equal the true economic cost of the reform to the residents of these cities. Rather, it is a transfer from government to the private sector that may have increased the net incomes of landowners, workers, or business owners. Assessing the effects of business tax reductions on economic welfare requires understanding the economic incidence of the tax. If business revenue forgone is offset by increases in land values, wages, or employment in cities, then the true loss in city incomes and potential government revenues is much smaller, and perhaps even negative. Nevertheless, it is clear that business plays a substantially smaller role in financing municipal government today than in 2000. There is little doubt that city managers balancing annual budgets—and city residents contemplating their own property tax bills—are facing the consequences of the business tax reductions.

3.1 Property tax reform

I now turn to a description of the reforms in business property taxation since 1998, when a province-wide uniform system of market value property assessment was introduced, replacing an earlier system of assessments based on historical values.⁶ Because the previous assessment base was generally closer to market values for business than residential properties, uniform reassessment would have resulted in large shifts of tax burdens from business to residential properties. To prevent such a shift, the provincial government authorized municipalities to adopt a classified

5. It is interesting to note that the provincial government has not reduced business tax ratios for education as quickly as it has required municipalities to reduce their own business tax ratios.

6. The property tax system is described in detail in Bird et al. (2012), upon which this summary relies heavily.

property tax system, which applied different rates to residential, commercial, industrial, and other property classes. Municipalities were given the option, which most exercised, to set the tax rates on each class in order to hold constant the shares of tax revenues paid by each class prior to reassessment. The result was the interclass tax rate differentials described above.

These differences were regarded as transitional, and the provincial government undertook further reforms in subsequent years to reduce business-to-residential tax differences. In particular:

- From 1998 to 2004: Where the ratio of the tax rate in a business property class to the residential tax rate exceeded 110 percent, the municipality was not permitted to increase the tax ratio.⁷ In such cases, the business tax rate could increase at most in proportion to the change in the residential tax rate.⁸ This restriction was binding for more than 90 percent of the tax classes and municipalities in my sample in all years 2000–2004, as described below.
- From 2001 to 2004: Where the tax ratio in a business class exceeded the 2001 average for the province,⁹ no increase was permitted in the total tax levy (defined as the tax rate times the total assessed value) paid by the class—a policy known as the “hard cap.” This restriction was more stringent than the previous constraint on tax ratios, and implied that the percentage tax rate on business classes would fall wherever the aggregate assessment for the class was increasing in nominal terms. Where this cap was binding, the tax paid by a property with the average rate of assessment growth in the class remained constant in nominal terms. Since the cap did not apply to the residential class, this policy induced an increase in the property tax share of residential properties in any municipality where aggregate property tax revenues were increasing due to budgetary cost increases.
- From 2004 on: The hard cap was relaxed in municipalities above the threshold. The total levy paid by a business class could now increase at up to one-half the rate of increase in the total residential levy. In these cases, business tax bills could now increase, but at a strictly lower rate than for residential properties in the municipality.

7. For “lower-tier” municipalities that share some tax revenue and spending responsibilities with “upper-tier” (or county) governments, tax ratios are required to be uniform among all lower-tier municipalities within the county, but each lower-tier municipality is free to choose tax rates that maintain the upper-tier tax ratio.

8. These and other constraints applied to properties zoned multi-residential (apartment buildings), in addition to commercial and industrial properties. I ignore the multi-residential class in what follows.

9. The threshold ratio of business to residential tax rates was 1.98:1 for commercial and 2.63:1 for industrial classes.

In summary, provincial policies have mandated a reduction in business tax rates since 2001. These mandates affect all municipalities, but particularly those with tax rates above the 2001 averages, which were the subject to the cap on levies. Other, uncapped municipalities could increase their business property taxes, but only to the extent that they kept the ratio of business to residential tax rates constant.¹⁰ Thus the provincial reforms induced exogenous variation in municipal business tax rates, which I explore in the empirical analysis below.

As a preliminary check on the importance of the provincial reforms, Figure 1 shows business tax rates in 2000 and 2006, before and after imposition of the “hard cap.” Observe that while tax rates fell virtually everywhere, the reductions were far larger in municipalities and tax classes subject to the cap. As a result, the average difference in tax rates between neighbouring cities fell substantially with the reform. (Conditional on initial tax rates, this variation is driven by the provincial policy, and not by the choices of a municipality or contemporaneous developments there.)

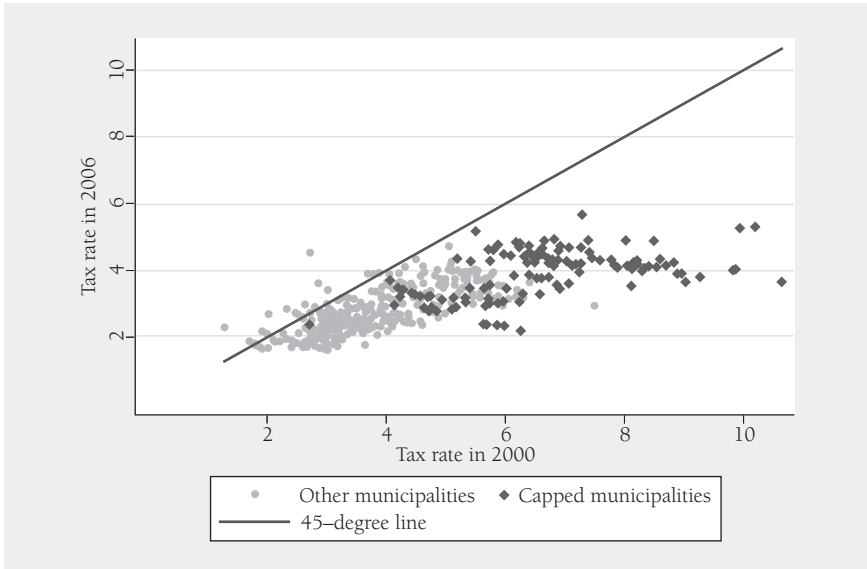
3.2 Business location and the suburbanization of employment

Local tax differences between core and suburbs are thought to be one factor contributing to the “suburbanization of employment” in metropolitan areas of Canada. In general, while population is still spread more widely across metropolitan areas than employment, employment has been suburbanizing faster than population. Heisz and LaRochelle-Côté (2005) studied suburbanization of employment in Canada using data from the 1996 and 2001 Censuses, and found that areas located within 5 kilometres of the city centre decreased their shares of employment in most CMAs. However, CMAs still exhibit a marked concentration of jobs in the urban core.

This pattern could, in principle, be caused both by changes in the industrial makeup of core cities, and also by a renewed taste of some households for urban living. To the extent that it reflects relative tastes and other sources of comparative advantage, the suburbanization of employment is not in itself of policy concern. However, the phenomenon could contribute to excessive commuting in metropolitan areas, which entails external costs, and could contribute to a “spatial mismatch” between the location of jobs and people that is harming employment prospects for some residents of central cities, particularly low-skilled workers. Furthermore, to the extent that it reflects excessive business tax rates in core cities, and in particular the relative tax advantage enjoyed there by residential over business land uses, then the suburbanization of employment indicates a loss in productivity and economic welfare.

10. In addition to the tax rate description described here, various other provincial regulations limited the rate at which taxes on individual properties could increase due to reassessments (“phase-in” and “capping” provisions). These policies were designed so that they did not affect the rate of increase for the average property in each property class; I therefore ignore them in what follows. For details, see Bird et al. (2012).

Figure 1: The change in business tax rates



To provide some preliminary evidence on the suburbanization of employment in my data, I present some descriptive statistics on employment and business location in core cities and their suburbs. I measure the pattern of industrial specialization by an index of employment intensity by city.

Let s_{ij} be the city j 's share of provincial employment in industry i in the 2001 Census, and n_j its share of provincial population. The employment intensity index is:

$$S_{ij} = \frac{s_{ij}}{n_j}$$

The index measures employment as a share of residential population relative to the provincial average. A city with S_{ij} of greater than 1.0 is relatively specialized in industry i . When the index is computed for the aggregate of all industries, say $S_j = s_j / n_j$, it is a measure of aggregate employment intensity at a location. A city with S_j greater than 1.0 is an “employment centre” that tends to import labour from neighbouring places, whereas one with S_j less than 1.0 is a “bedroom community” that tends to export labour.

Table 2 reports employment intensity indexes in the southern Ontario CMAs for the industry groupings used in the subsequent analysis. The data are from a 20 percent sample of the 2001 Census, which reports the usual place of work for each respondent. For each CMA, the index is computed separately for the urban core

Table 2: Employment intensity by industry and city, 2001

	All industries		Manufacturing		Trade		Services	
	Core	Suburbs	Core	Suburbs	Core	Suburbs	Core	Suburbs
Brantford	0.98	1.03	1.59	1.69	0.90	1.01	0.66	0.68
Guelph	1.08	1.04	1.64	1.58	0.90	1.05	0.78	0.75
Hamilton	0.95	1.03	1.12	1.12	0.94	1.10	0.72	1.16
Kingston	0.88	0.82	0.37	0.68	0.80	0.81	0.68	0.52
Kitchener	1.07	1.04	1.66	1.48	1.03	0.95	0.87	0.91
London	1.01	1.00	0.85	1.26	0.99	0.95	0.95	0.66
Oshawa	1.00	1.01	1.22	0.91	1.06	1.04	0.76	1.17
Ottawa	0.90	1.03	0.51	0.94	0.80	0.97	1.24	0.96
Peterborough	0.90	0.99	0.67	0.85	0.87	0.93	0.64	0.63
St. Catharines	0.95	0.94	0.95	1.01	1.01	0.92	0.69	0.65
Toronto	1.00	1.04	0.85	1.06	0.90	1.27	1.41	1.25
Windsor	0.95	1.01	1.57	1.73	0.78	0.86	0.56	0.57

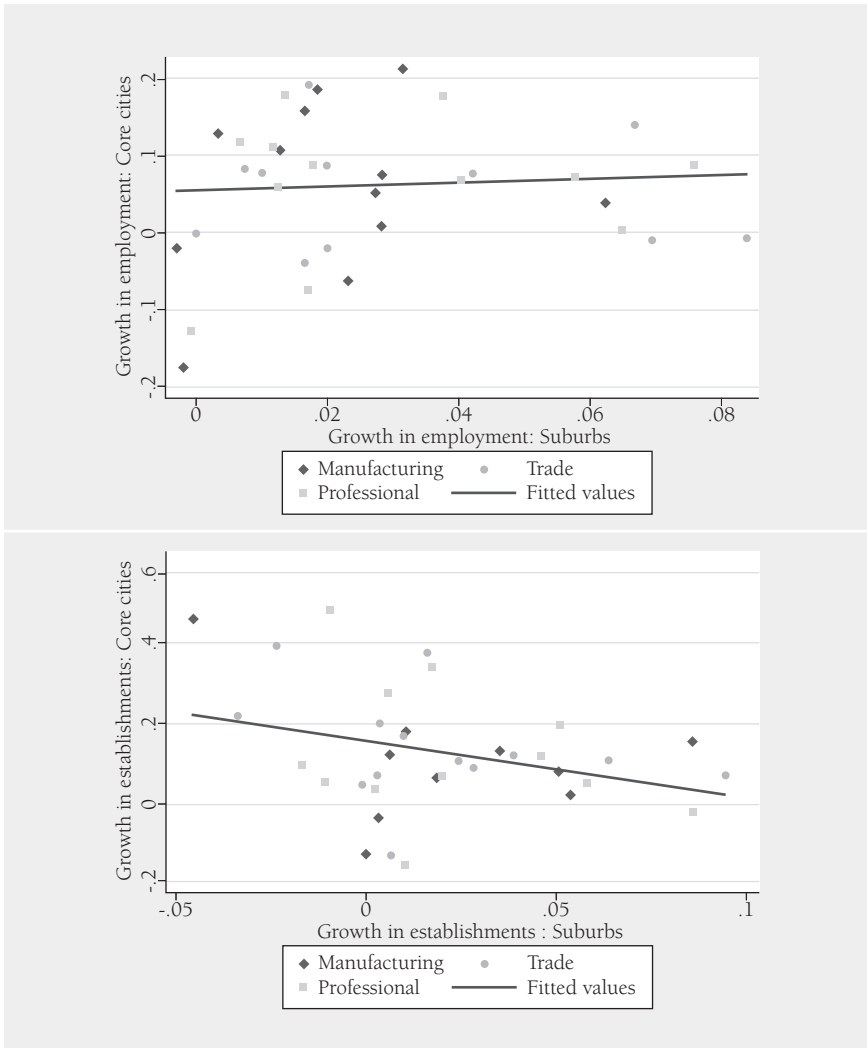
city (“Core”), and for the core city’s five closest neighbours (“Suburb”). For the aggregate of all industries, the core city indexes range from 0.90 to 1.08, indicating that some core cities remain employment centres relative to the provincial average, but many are not. In 7 of the 12 CMAs, the aggregate index is lower in the core city than the neighbouring suburbs, indicating considerable suburbanization of employment. This list includes the largest cities and traditional manufacturing centres, such as Toronto, Ottawa, Hamilton, and Windsor.

The indexes for industry groupings reveal patterns of industry specialization. I use the following industry aggregates: Manufacturing (NAICS codes 31–33), Wholesale and Retail Trade and Transport (NAICS codes 41–48), and Services, including Finance, Insurance and Real Estate, and other industries with a high proportion of employment in professional occupations (NAICS codes 51–56).¹¹ Several core cities remain specialized in manufacturing, including Brantford, Guelph, Kitchener, and Windsor, but this is a regional phenomenon, with neighbouring communities showing similar patterns. Not surprisingly, Ottawa and Toronto are specialized in services, and to a much greater extent than surrounding communities.

The strong correlation between intensity indexes for core city and suburbs suggests that the suburbanization of employment is not a simple phenomenon. While cities may be “competing for jobs” with their neighbours, region-wide factors clearly play a role. One possible explanation is agglomeration economies at the regional level, or other positive spillovers across communities. This point has been made for the United States by Haughwout and Inman (2002), among others. But the cross-sectional data may simply reflect region-wide common factors, such as access to markets or to key production inputs, which would also explain why

11. I exclude from this classification primary industries, and tertiary industries that many produce non-tradables (such as accommodation) or are in the broader public sector (such as education and health care). These industries are likely to be least responsive to tax differentials in their location choices.

Figure 2: Growth in employment and establishments, core cities, 2001-2006



employment specialization is similar in core and suburban cities. The data for the 2001 cross-section also do not show how employment patterns are changing over time.

The first panel of Figure 2 provides evidence on employment growth between the 2001 and 2006 Censuses, for core cities and their suburbs. The data show essentially no relationship, positive or negative, between core and suburban growth, as indicated by the line of best fit that is nearly flat. My data, aggregated to

the municipality (census subdivision) level, are coarser than those used by Heisz and LaRochelle-Côté (2005) and others who have found evidence for suburbanization, which may explain the lack of effect.

The second panel of Figure 2 shows the same relationship, but for a measure of business location rather than employment. I use counts of establishments with 10 or more employees in each municipality, from the annual Canadian Business Patterns data, which again I divide by population and normalize by dividing by the provincial average to arrive at the intensity index. The establishment data does show a small negative correlation between establishment growth in core cities and their suburbs, but the estimated relationship is insignificant.

This analysis of correlations is necessarily inconclusive. Core cities and their suburbs tend to be affected by common economic shocks that cause their economies to grow together over time, and that may therefore mask evidence of suburbanization of employment. In what follows, I turn to a more reliable way of estimating the trade-offs between economic activity in core and suburbs, based on the Ontario property tax reform.

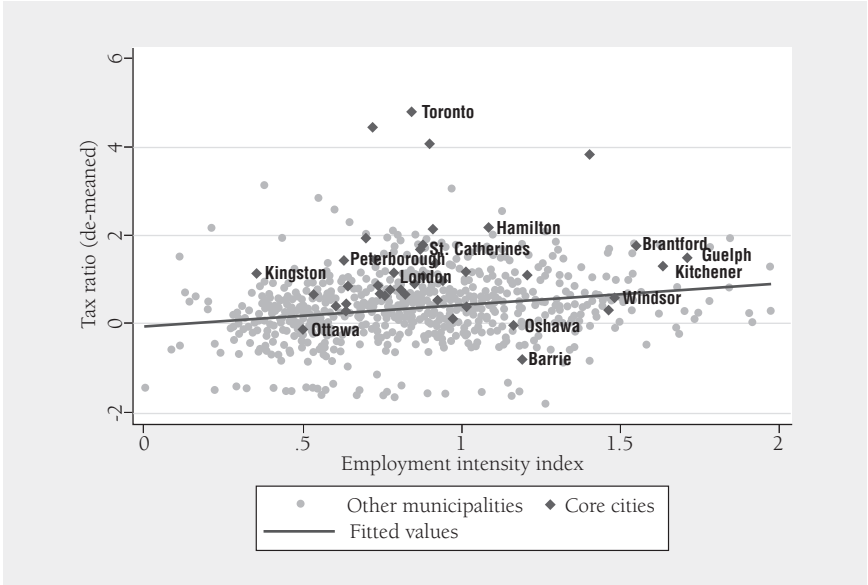
The theoretical literature suggests that city residents may prefer high rates of property taxation to the extent that the taxes are “exported” to non-resident workers in the form of lower wages. As a preliminary check on the validity of this tax exporting view, I present in Figure 3 evidence on the pattern of taxes prevailing prior to the reform. The dependent variable is the percentage tax rate applied to commercial, industrial, or office properties relative to the municipality’s residential tax rate; the mean of the tax ratio for each industry and region of the province has been subtracted, to render the observations comparable. The mean tax ratio for each observation is graphed against the corresponding employment intensity ratio for manufacturing, trade, and services in the municipality, from the 2001 Census.

Tax ratios are generally increasing in employment intensity, and the slope of the line of best fit is 0.595 ($\sigma = 0.106$). As suggested by the tax exporting view, municipalities with high employment intensity in an industry, which tend to “import” labour from neighbouring jurisdictions, also levy the highest relative tax rates. In the figure, observations for the 12 core cities are highlighted, and (in the interests of legibility) the observations for manufacturing are labelled with the city’s name. Core city tax rates are higher than would be predicted by their employment intensity alone. This finding is consistent with the idea that cities that are fully built-out, and where taxes are most likely to be capitalized into land values, are those that tax business properties at the highest rates.

4. Property tax reform: An evaluation

The preceding discussion suggests that it is important to evaluate the effects of the business property tax reductions on business location and employment, and, more generally, to understand the sensitivity of business location decisions to property tax differentials. In this section, I use regression methods to provide some answers to these questions. The following discussion is therefore necessarily somewhat

Figure 3: Business tax ratios and employment intensity



technical; the reader uninterested in the technical aspects will find the qualitative conclusions summarized in the following section.

4.1 Empirical strategy

To learn about the effects of business property taxes on business location, I estimate regression models of the form:

$$\Delta \log E_{mi} = \alpha + \beta \Delta \log t_{mi} + \gamma \Delta \log \bar{t}_{-mi} + \theta X_{mi} + \epsilon_{mi} \quad (1)$$

where the dependent variable is the change in the logarithm of the number of business establishments in industry i and municipality m , $\Delta \log t_{mi}$ is the change in the logarithm of the effective tax rate on industry employment in municipality m , $\Delta \log \bar{t}_{-mi}$ is the corresponding change in log effective tax rate for neighbouring municipalities, and X_{mi} is a vector of control variables.

The three industries used in the analysis are the “one-digit” aggregates of Manufacturing, Wholesale and Retail Trade, and Services, which correspond roughly to the Industrial, Commercial, and Office Building property classes defined under Ontario legislation from which the industry-specific tax rates are defined. The statutory tax rate in Ontario is specified as a percentage of property values. The decline in statutory tax rates over time is apt to overestimate the true decline in business tax burden, because property values were rising over the period of study. I therefore define the effective tax rates on employment t_{mi} as the ratio of

the total levy (tax revenue) paid by the property class in the municipality, divided by the total employment for the industry in the municipality as recorded in the Census. The neighbour-tax rates \bar{t}_{-mi} are defined as the unweighted average of the corresponding tax rates in the five closest neighbouring municipalities.

Since the tax reform occurred gradually, mostly over the 2001–2004 period, and since changes in business location are apt to lag the tax reform, the dependent variable is defined as the change in establishment counts between 2000 and 2006. (When the dependent variable is the log change in Census-based measures of industry employment and earnings, as discussed below, the base year is the value from the 2001 Census.)

While equation (1) therefore defines a standard difference-in-difference model, there are several reasons to believe that estimating (1) by ordinary least squares is apt to yield biased estimates of the tax elasticities β and γ . The first is attenuation bias due to measurement error in the effective tax rates. Measurement error is especially pronounced in this case, because the denominator of the municipality's effective tax rate is industry employment, which is presumably positively correlated with the dependent variable. As well, in this case, measurement error has a spatial dimension. Establishments are assigned to municipalities in the Business Register data based on postal codes, and related establishments may exist on both sides of municipal boundaries, which will likely induce positive correlation between the neighbour-tax rate and the error term in equation (1). In summary, measurement error is likely to lead to downward bias in the OLS estimate of β for the usual reasons, but also perhaps upward bias in the estimate of γ .

The second source of bias is omitted variables. As suggested by the discussion of Figure 3, the level of business tax rates prevailing before the reform was positively related to the level of industry employment in the municipality, relative to population. In the absence of the provincially mandated tax reform, changes in tax rates thereafter may also therefore plausibly be correlated with changes in business location or employment on the left-hand side of (1). Since shocks to business location are spatially correlated, the neighbour-tax rate is endogenous in (1) for the same reason.

All these factors suggest an instrumental variables strategy for estimating (1). The natural candidate for instruments are the changes in effective tax rates induced by the provincially mandated reform. As discussed, provincial law between 2001 and 2004 required municipalities to hold the total levy paid by property owners in a class constant in nominal terms (“capped”), if the municipality's tax ratio for the class was above the specified threshold level in the preceding year. Thus the policy induced a decline in real effective tax rates above the threshold, but not below the threshold. A natural instrument for t_{mi} is therefore an indicator variable CAP_{mi} equal to one if the municipal tax rate was capped for property class i in the year 2001. The corresponding “natural” instrument for the neighbour average tax rate \bar{t}_{-mi} is the fraction of the five neighbours that faced a cap in the class in the same

year ($NBCAP_{mi}$). Since the effects of the reform on business location are apt to differ if a municipality and its neighbours are both reducing taxes simultaneously, the interaction of these two variables is also excluded as an instrument for tax rates. (Including the interaction term has the additional advantage of over-identifying (1).)

The control variables in (1) include the change in log municipal population, the change in the municipal residential tax rate, and fixed effects for industry and each of three regions of the province, which allow for the possibility of different sectoral and regional trends that are correlated with the instruments. To control for transitory effects, the equation includes the log number of establishments in the base year (with corresponding base-year controls for the other dependent variables reported below). As well, CAP is by construction correlated with the base year effective tax rate, which could exert lagged effects on the change in the dependent variable between the base year and 2006. The log of the effective tax rate in the base year is therefore also included as a control variable in all specifications. In some cases, establishment counts in some municipalities and industries are zero. To avoid excluding these observations and dealing with the resulting selection biases, I defined the dependent variable as the logarithm of the establishment count, and included an indicator variable for observations in which the 2006 establishment count is zero.

4.2 Estimates

In the first instance, I estimated the tax elasticities β and γ using as instruments CAP, NBCAP and their interaction. The reduced form estimates of this model are of independent interest, even if unbiased estimates of tax responsiveness were not being sought, since they represent the direct effects of the provincial tax reform on the spatial distribution of establishments and employment. The results from this approach are presented in Table 3, where the dependent variable is defined as the number of establishments with 10 or more employees. (To deal with the correlation between industries in changes in local business activity, the reported standard errors throughout the paper are clustered at the municipality level.)

The first column of the table presents reduced-form estimates. Municipalities that were subject to the provincial tax cap saw an increase in establishments located within municipal boundaries of approximately 15 percent by 2006; the point estimate is significantly different from zero. Municipalities with five neighbours subject to the tax cap saw an approximately 14 percent decrease in establishments, but the latter effect is not significant. As expected, the effect of the cap is smaller, though still positive, when neighbouring municipalities were also subject to the cap.

The next two columns of the table report first-stage results with the same instruments. The tax caps exert strong effects on own and neighbour taxes in the expected direction. The interaction effect is positive, indicating that the cap exerted a smaller downward effect on effective tax rates when neighbours were capped too. (The likely reason is that property values were growing more quickly

Table 3: Instrumental variables estimates of tax elasticities

	$\Delta\log(E)$	$\Delta\log(TAX)$	$\Delta\log(NBTAX)$	$\Delta\log(E)$
CAP	0.15** (0.07)	-0.82*** (0.30)	-0.13 (0.17)	
NBCAP	-0.14 (0.11)	-0.28 (0.26)	-0.57** (0.23)	
CAP \times NBCAP	-0.08 (0.13)	0.94** (0.39)	0.54* (0.28)	
$\Delta\log(TAX)$				-0.23* (0.13)
$\Delta\log(NBTAX)$				0.38 (0.27)
$\Delta\log(\text{Population})$	0.44*** (0.13)	-0.09 (0.24)	0.13 (0.13)	0.37** (0.15)
$\log(TAX)$ in 2000	0.00 (0.01)	-0.07*** (0.02)	-0.03** (0.01)	-0.00 (0.01)
$\log(E)$ in 2000	-0.07*** (0.01)	0.06** (0.03)	0.03* (0.02)	-0.07*** (0.01)
Observations	783	783	783	783
R-squared	0.28	0.08	0.09	-

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robust standard errors, clustered by municipality. All specifications include industry and region fixed effects.

in regions where many municipalities had high initial tax rates, so that the cap on nominal levies exerted a smaller downward effect on effective tax rates there.)

The final column of the table reports the resulting two-stage least squares estimates of equation (1). The estimated elasticity of establishments with respect to a municipality's own-tax rate is -0.23, compared with +0.38 for the average tax rate of the neighbours. The finding that the neighbour-tax effect is larger than the own-tax effect is surprising. For example, it implies that the effect of a coordinated increase in all municipal tax rates is to increase the number of establishments everywhere. Note, however, that the estimated neighbour-tax elasticity for these instruments is insignificant in any case.

The structure of the data suggests some alternative instruments for the neighbour average tax rate. Since there are five neighbours, the tax cap was binding in 2001 on some number of neighbours between zero and five. Alternative instruments can therefore be constructed using indicator variables for the number of capped neighbours, in place of the linear specification. Inspection of the data suggests that initial tax rates exhibit positive spatial correlation: if one municipality was capped, then it is more probable that others were too. In fact, for capped

Table 4: Alternative instruments

	(1)	(2)	(3)
$\Delta \log(TAX)$	-0.23* (0.13) -[0.045]	-0.25** (0.10) [0.049]	-0.17** (0.08) [0.075]
$\Delta \log(NBTAX)$	0.38 (0.27) [0.023]	0.18** (0.09) [0.044]	0.21* (0.11) [0.047]
$\Delta \log(\text{Population})$	0.37** (0.15)	0.41*** (0.14)	0.39*** (0.13)
$\log(TAX)$ in 2000	-0.00 (0.01)	-0.01 (0.01)	-0.00 (0.01)
$\log(E)$ in 2000	-0.07*** (0.01)	-0.07*** (0.01)	-0.07*** (0.01)
Observations	783	783	783
Observations	707	707	707
Hansen J	0.539	1.998	6.554
(p -value)	(0.463)	(0.573)	(0.684)

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Robust standard errors, clustered by municipality. All specifications include industry and region fixed effects. The excluded instruments in the three columns are:

- 1: Residential tax, CAP, mean NBCAP, and their interaction;
- 2: Residential tax, CAP, dummies for no capped neighbours and all capped neighbours, and their interactions with CAP;
- 3: Residential tax, CAP, dummies for all numbers of capped neighbours, and their interactions with CAP.

In brackets are Shea's partial R^2 for each the first stage specifications.

municipalities, the modal outcome (probability 0.37) is that all five neighbours were capped in 2001, whereas for uncapped municipalities, the modal outcome is zero capped neighbours. A simple alternative is therefore to use as excluded instruments a vector of indicators for municipalities having zero capped neighbours, five capped neighbours, and the interactions of these two variables with CAP. A more extreme alternative is the "saturated" model, with a full set of dummies for the six possible number of neighbouring caps, and their interactions with CAP.

Two-stage least squares results for the three variant instruments sets are presented in Table 4. Robust and clustered standard errors of coefficients are reported in parentheses as before. While first-stage coefficients are not reported here, the table includes Shea's partial R^2 for each specification, reported in brackets below each reported coefficient for the corresponding endogenous variables.

The estimated tax elasticities in all three specifications are quite similar, although point estimates are somewhat smaller and the precision is greater for specifications (2) and (3) than for the “simple” instruments of specification (1). The partial R^2 results suggest that the excluded instruments in specifications (2) and (3) have considerably more power in explaining variation in the neighbour average tax rate, so that the potential for bias in the two-stage least squares estimates should be smaller in this case. On the other hand, the number of excluded instruments in the “saturated” specification (3) is 13, which tends to exacerbate bias in the presence of weak instruments. Taking all these considerations into account, it seems that specification (2)—with indicators for “no capped neighbours” and “all capped neighbours” and the interactions—is the preferred one. Note also that, on the basis of the standard over-identification test statistic, we cannot reject excluding instruments from the second stage in any of the three cases.

In specification (2), the estimated own-tax elasticity is -0.25 , and the estimated neighbour-tax elasticity is $+0.18$. The neighbour-tax effect is (reassuringly) smaller than the own-tax effect, but the two are very similar, and statistically indistinguishable. This finding suggests that tax reductions in one municipality increase business location over time, largely at the expense of its neighbours. According to the estimates, the effect of a coordinated tax reduction by all municipalities is extremely small. Indeed, the estimated -0.25 elasticity suggests that even the effect of uncoordinated own-tax reductions is rather small: a tax rate reduction of 40 percent—about what has occurred among the municipalities with the highest initial tax rates—causes an increase in business location of just 10 percent, according to this estimate. As discussed in Section 2, under the canonical “capital tax view” of the property tax, businesses should be highly mobile across local boundaries in response to tax differentials. The estimates reported here are instead consistent either with a rather small degree of business mobility, or else with the possibility that local tax differentials are capitalized into local land price differentials or into wages.

Table 5, the final table of results, explores these possibilities further, using other dependent variables in place of the change in establishments with ten or more employees. In the first column, the dependent variable is the change in log municipal employment in the industry between the 2001 and 2006 Censuses. The own-tax effect is smaller in this case and insignificant, but still similar to that obtained for establishments. The neighbour-tax effect is somewhat larger, but again similar. One possible explanation for the smaller own-tax effect on employment is that large establishments are less tax-sensitive than smaller ones. As evidence of this possibility, column reports results for equation (1) using as the dependent variable the log change in the number of establishments with 100 or more employees. The estimated own-tax elasticity, at -0.20 , is indeed somewhat smaller in this case than that for all establishments, but not much.

In the final column of Table 5, the dependent variable is the change in the log of average employment income of full-time, full-year employed men residing in the municipality, as reported in the 2001 and 2006 Censuses. As discussed in Section 2,

Table 5: Alternative dependent variables

	Employment	Large establishments	Earnings
$\Delta \log(TAX)$	-0.10 (0.07)	-0.20** (0.10)	-0.03 (0.04)
$\Delta \log(NBTAX)$	0.26** (0.11)	0.19** (0.09)	0.05** (0.03)
$\Delta \log(\text{Population})$	0.37** (0.15)	0.41*** (0.14)	0.39*** (0.13)
Observations	782	783	260
Hansen <i>J</i>	2.060	7.061	3.817
(<i>p</i> -value)	(0.560)	(0.070)	(0.282)

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Robust standard errors, clustered by municipality. All specifications include industry and region fixed effects and controls for the change in log population and the base year values of the log tax rate and the dependent variable.

if business property taxes reduce labour productivity in a municipality, and if labour is less than perfectly mobile between economic regions, then taxes may be partially capitalized into lower wages for workers. Moreover, if workers are less mobile than firms across municipal boundaries within a region or metropolitan area, then wage capitalization as well as land price capitalization will tend to reduce the mobility of business and employment in response to tax differentials.

While individual wages are not available in the profiles of census subdivisions published from Census data, average employment income is available, and it may be a proxy for wages and labour productivity. (Since employment income is published only for the aggregate of all industries, the sample size falls, and I somewhat arbitrarily associate the data with the tax rates for the Office Building class, on the grounds that Services is the largest employer of the three industry aggregates in the data.) The results for employment income may be of independent interest anyway, to the extent that they speak to whether “good jobs” are moving in response to the tax changes. However, the results are largely inconclusive on these questions. The estimated elasticities for employment income have the expected signs, but the estimated own-tax elasticity is small and statistically insignificant. The neighbour-tax elasticity is positive and significant, though again small. While these results are suggestive of some capitalization of tax differences into local wages, they are less than definitive.

5. Concluding remarks

Business property taxes in Ontario have fallen substantially in the past decade, largely because of a series of reforms mandated by the provincial government. According to a (conservative) “static” estimate, the reform has reduced taxes paid on commercial and industrial properties by about \$2 billion per year, with more

than half the forgone revenue accounted for by municipal and education property taxes in the City of Toronto. Arguably, the reform has caused a large shift in tax burdens from business to residential ratepayers, and contributed to the fiscal pressures currently facing Toronto and other Ontario municipal governments.

Whether these revenue reductions are desirable or not depends on whether the tax is ultimately paid by businesses occupying land in high-tax cities, or shifted through price changes to workers, owners of land, or other factors of production. In the standard economic views of the property tax, it is ultimately either a tax on capital employed in residential and non-residential structures, or it is a tax on local land values. If the former view is correct, then property taxes (particularly those on business properties) create high economic costs by discouraging investment, distorting location, and reducing productivity, and there is a strong case for reforms to reduce business taxes to the same rates as those for residential properties, or even below. If the latter view is correct, then the property tax is an efficient means of raising revenue for local governments, and high rates of business taxation are no cause for concern—even if rates differ between neighbouring locations.

The quantitative analysis in this paper goes some way towards a fuller understanding of the economic effects of the local business property tax, and a fuller evaluation of the effects of the reform in Ontario. The analysis investigates the links between business location and employment decisions and property taxes. As well as illustrating the effects of the provincial reform, the approach in this paper permits us to learn more about the tax responsiveness of business location more generally, because it exploits changes in property taxes induced by provincial policy since 2001. These changes are separate from other factors driving “voluntary” local tax changes that may be correlated with unobservable determinants of local economic activity, which would otherwise lead to biased estimates of tax responsiveness.

In the preferred empirical specification, the estimate of municipal property taxes on business location is statistically significant, but economically small. According to my estimates, a 40 percent tax rate reduction by the average municipality would cause an increase in the number of business establishments locating there of about 10 percent. On the other hand, a 40 percent tax rate reduction by the municipality’s closest neighbours would cause an offsetting decrease in business establishments of about 7 percent. Similar results are obtained for the sensitivity to local tax differentials of both large employers and total industry employment in the municipality.

These results have strong implications for the standard economic theories of the property tax. Under the canonical “capital tax view” of the property tax, businesses should be highly mobile across local boundaries in response to tax differentials. The estimates reported here instead suggest that businesses are relatively immobile in response to changes in local tax differentials, even over a period of several years. More elaborate theories suggest a number of reasons why this may be the case. Moving is costly, and the full effects of the tax reform may not be realized until much later, after the natural process of exit and entry causes

business activity to shift fully in response to the tax reform. As well, the low degree of observed mobility may reflect the capitalization of local tax differentials into local land price differentials, or into wages at the municipal and regional level. In this sense, my results are more consistent with an extended “benefit tax view” than the “capital tax view” of property taxation.

In more practical terms, the results allow us to draw some conclusions about the desirability of the Ontario reforms. The small estimated elasticities of business location to tax differentials imply that the gains in productivity from greater tax harmonization are comparatively small. On the other hand, while the revenue cost of the reform was comparatively large, the revenue forgone does not represent a true economic cost to the residents of the cities experiencing tax reductions. Rather, it is a transfer from government to the private sector, that may increase the net incomes of landowners, workers, or business owners.

Assessing the effects of business tax reductions on economic welfare requires further understanding of the economic incidence of the tax. If business revenue forgone is offset by increases in land values, wages, or employment in cities, then the true loss in city incomes and potential government revenues is much smaller, and perhaps even negative.

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Appendix: Summary Statistics

	(1)	(2)
Variables	Mean	SD
Establishments by Sector	76.9	415.6
Employment by Sector (thousands)	4.4	20.1
Average earnings (\$ thousands)	53.8	12.6
Effective tax rate in 2000 (\$ per employee)	716.8	989.9
Population (thousands)	44.6	184.1



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