UPDATED ESTIMATES OF THE EFFECTS OF EARNINGS TAXES ON CITY GROWTH

By Howard J. Wall

I. INTRODUCTION

City governments provide important services to city residents, and these services need to be financed through taxation. In turn, taxation alters the decisions of those being taxed, and these effects need to be considered when city officials are deciding how to finance the services provided. Put simply, a city government needs to be mindful of the aphorism "If you tax something, you will get less of it." Because of the relative immobility of property, property taxes are the most important source of tax revenue for cities: Across U.S. cities in 2011, property taxes accounted for about 17 times as much revenue as did income taxes.[1] The City of Saint Louis and Kansas City, Mo., however, are relatively reliant on income taxes instead of property taxes. Revenue from their 1 percent earnings taxes—which are levied on all residents and non-residents who work within city limits—are, respectively, 2.5 and 1.6 times their revenue from property taxes.[2]

A city government needs to be mindful of the aphorism "If you tax something, you will get less of it."

There is strong evidence that the economies of Saint Louis City and Kansas City have been harmed because of the cities' relative reliance on earnings taxes. In a 2011 study that the Show-Me Institute published, I estimated that the earnings tax was responsible for about one-fourth of the population loss that Saint Louis experienced between 1990 and 2000, and for about one-third of the city's decrease in employment.[3] I also found that Kansas City's population would have grown twice as fast as it did over the decade, while its employment would have grown one and a half times as fast as it did. Additionally, the earnings taxes in the City of Saint Louis and Kansas City were associated with faster growth in the rest of the two cities' metro areas. Similarly, in a 2006 study, Show-Me Institute Chief Economist and University of Missouri–Columbia Economics Professor Joseph Haslag found that per capita personal income levels in Saint Louis City and Kansas City tended to be 5.6 percent lower than in the remainders of their respective metropolitan areas because of their earnings taxes.[4]

The purpose of this paper is to use the broadest and most recent data available to obtain updated estimates of the effects of earnings taxes on growth in the City of Saint Louis and Kansas City. Because the U.S. Census Bureau has changed how it releases its data for cities, however, only population data are available. Nonetheless, using city-level data from the Census Bureau for the decade between 2000 and 2010 provides enough information to show

that cities choosing to raise revenue through earnings-based taxes appear to have significant negative effects on growth in the taxing cities as well as their surrounding metro areas.

II. DATA AND ESTIMATION

As with my previous estimation for the 1990s, I use city-level data for cities larger than 25,000 in population from the U.S. Census Bureau's decennial census. I obtained earnings tax data for as many of these cities as possible, using an analysis of local income taxes from the Tax Foundation as a guide.[5] Earnings taxes of the sort I am interested in are levied in 11 states: Alabama, Delaware, Indiana, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, Ohio, and Pennsylvania.[6] Kentucky had to be excluded from the data because its largest city, Louisville, merged with its county during the decade, so its data for 2010 were not comparable to those for 2000.[7] Maryland was also excluded because there was insufficient data for cities other than Baltimore. Despite these exclusions, the resulting data set includes 185 cities, 79 of which have earnings taxes.[8] The 19 Missouri cities included in the data set are listed in Table 1, which provides their populations in 2000 and 2010, along with their population growth rates over the decade. Note that the City of Saint Louis and Kansas City are the only Missouri cities that impose earnings taxes.

Table 1. Population Growth in Missouri Cities, 2000-2010

City	Metro Area	Population 2000	Population 2010	Population Growth (%)
O'Fallon	Saint Louis	46,169	79,329	71.8
Lee's Summit	Kansas City	70,700	91,364	29.2
Columbia	Columbia	84,531	108,500	28.4
Liberty	Kansas City	26,232	29,149	11.1
Joplin	Joplin	45,504	50,150	10.2
Blue Springs	Kansas City	48,080	52,575	9.3
Saint Charles	Saint Louis	60,321	65,794	9.1
Jefferson City	Jefferson City	39,636	43,079	8.7
Cape Girardeau	Cape Girardeau-Jackson	35,349	37,941	7.3
Maryland Heights	Saint Louis	25,756	27,472	6.7
Springfield	Springfield	151,580	159,498	5.2
Kansas City	Kansas City	441,545	459,787	4.1
Saint Joseph	Saint Joseph	73,990	76,780	3.8
Independence	Kansas City	113,288	116,830	3.1
Saint Peters	Saint Louis	51,381	52,575	2.3
Chesterfield	Saint Louis	46,802	47,484	1.5
Kirkwood	Saint Louis	27,324	27,540	0.8
Hazelwood	Saint Louis	26,206	25,703	-1.9
Saint Louis	Saint Louis	348,189	319,294	-8.3

Source: U.S. Census Bureau.

The empirical model that I estimated with this data is:

$$\dot{N}_i = \alpha_s + \beta t_i + \gamma T_i + \omega T_i^2 + \lambda N_i + \delta D_i + \rho(N_i \times D_i) + \sigma S_i + \theta M_i + \varepsilon_i,$$

for which the dependent variable is $\dot{N}_i$, the percentage change in population for city i. The tax variables are t_i (city i's earnings tax rate) and T_i (the difference between the tax rate in the largest city in the metropolitan area and city i's tax rate).[9] To isolate the effects of these tax variables, the estimation needs to control for differences in growth that had nothing to do with earnings taxes. For instance, growing cities have tended to become denser over time while their surrounding metro areas became more sprawling as smaller, outlying parts of the metro area grew faster than the metro area as a whole.[10] To control for

There is strong evidence that the economies of Saint Louis City and Kansas City have been harmed because of the cities' relative reliance on earnings taxes.

The earnings tax in the central city of a metro area might have a negative effect on overall metro area growth.

the first part of this trend—called agglomeration—the model includes the initial population levels and population densities for each city (N_i and D_i, respectively), along with their interaction ($N_i \times D_i$). To control for the second part of this trend—suburban sprawl—the model includes each city's initial share of total metro area population (S_i). Another long-term trend in city growth that needs to be controlled for is the decline in manufacturing as a source of employment. To do so, the model includes the share of employment that was in manufacturing in 2002 (M_i), the closest year to 2000 for which data were available. Finally, there are many trends that occur at the state and regional level which need to be controlled for—such as population shifts toward the Sun Belt, changes in state-level tax and other policies—that are difficult or impossible to measure or even to observe. To capture the effects of these trends, which should be common for all cities within a state, the model includes state dummy variables (α_s).

The empirical model here has an important innovation over my earlier study in that it allows for T_i, the intra-metro tax differential, to have a non-linear effect. That is, we might expect that the earnings tax in a central city has two opposing effects on population growth in the rest of the metro area. The first effect is that the tax creates an incentive for people to locate outside of the central city but within the metro area. The second effect is that, by harming the vitality of the central city, the tax makes the metro area as a whole a less

attractive place to live and work. In other words, the earnings tax in the central city of a metro area might have a negative effect on overall metro area growth.[11] The quadratic specification of T_i will capture how the relative sizes of these two effects can depend on the level of T_i.

Table 2 presents the results from estimating the full model described previously. According to these estimates, each percentage point of the earnings tax rate is associated with a 4.2 percentage point decrease in the population growth rate of the taxing city. This negative coefficient is statistically significant and consistent with the notion that you get less of something if you tax it. The practical significance of this effect for Kansas City and the City of Saint Louis is discussed in the next section. Note that, because the intra-metro tax differential is allowed by the model to have a non-linear effect, the statistical significance of the coefficients on T_i and T_i^2 must be tested jointly rather than on their own. According to a test of joint significance, the results indicate that the intra-metro tax differential has a statistically significant effect on a city's population growth. Specifically, for the case in which the central city levies an earnings tax but other places in the metro area do not, a tax rate below 1.16 percent is associated with higher population growth in the rest of the metro area, and a tax rate above 1.16 percent is associated with lower population growth.

In addition to allowing for a non-linear effect for the intra-metro tax

Table 2. Estimation Results

Role	Variable (notation)	Parameter	Coefficient	t-statistic
Effect on the city levying the tax	Earnings tax rate (t_i)	β	-4.226**	-2.48
Effect on cities in the same metro area as the taxing city	Intra-metro tax differential (T_i)	γ	1.108	0.35
	Intra-metro tax differential squared (T_i^2)	ω	-0.959	-1.03
Agglomeration effects	Initial population (N_i)	λ	-1.583	-1.48
	Initial density (D_i)	δ	-10.509	-0.25
	Interaction of population and density ($N_i \times D_i$)	ρ	6.750*	1.70
Suburban sprawl	Initial share of metro population (S_i)	σ	-0.141**	-2.37
Decline of manufacturing	Initial manufacturing share (M_i)	θ	-0.287	-1.41
Significance of the intra-metro tax differential	Test of the joint significance of γ and ω		F(2,168) = 2.53; Prob > F = 0.0827 *	
Explanatory power	R^2		0.259	

Standard errors are corrected for heteroskedasticity. Statistical significance at the 5 percent and 10 percent levels are indicated by a double or single asterisk, respectively. The estimates of the state dummy variables, which are statistically significant, are suppressed for space considerations.

differential, the empirical model differs from the one I used in my earlier study. Specifically, my previous estimation included neither a city's shares of metro population nor a variable controlling for the interaction between population and density. In the interest of full disclosure of the effects that these modifications have on the estimation, I have included an appendix showing the estimation with the full model, with a linear intra-metro tax differential effect, and

with only the variables included in my earlier study. In short, the full model and the model with a linear effect for T_i are statistically indistinguishable from each other, although the latter model yields even larger negative effects for earnings taxes;[12] and, although the model stripped of the additional variables finds a smaller negative effect for earnings taxes, this is because of specification bias.[13]

Each percentage point of the earnings tax rate is associated with a 4.2 percentage point decrease in the population growth rate of the taxing city.

Just more than half (14,700 people) of the City of Saint Louis' population decline of 8.3 percent (28,900 people) might be attributed to the city's earnings tax.

III. RESULTS APPLIED TO SAINT LOUIS CITY AND KANSAS CITY

According to the results in Table 2, a city earnings tax of 1 percent, as in the City of Saint Louis and Kansas City, is associated with a 4.2 percentage point reduction in population growth. That is, just more than half (14,700 people) of the City of Saint Louis' population decline of 8.3 percent (28,900 people) might be attributed to the city's earnings tax. For Kansas City, the estimates indicate that population growth would have been 8.4 percent (36,900 people) instead of 4.1 percent (18,200) if the city did not have an earnings tax—a loss of 18,700 people over the decade.

In addition to the negative effects in the City of Saint Louis and in Kansas City, the earnings taxes are associated with slightly higher population growth in the rest of the two metro areas. If the City of Saint Louis and Kansas City did not have earnings taxes, the results suggest that the rest of their respective metro areas would have seen population growth that was about 0.15 percentage points ($\gamma + \omega$) higher. Although statistically significant, this effect is small because: (1) any population shift out of the central city is spread thinly over the entire metro area, and (2) there appears to be a secondary effect by which the entire region suffers from a central city's earnings tax.

Applying the estimated effects of the intra-metro tax differential, the results indicate a 3,500-person gain in population in the Saint Louis metro area outside the City of Saint Louis,

and a gain of 2,100 persons in the Kansas City metro area outside the city of Kansas City.[14] Because these gains are smaller in absolute terms than the losses in the central cities, earnings taxes are associated with net population losses for each metro area as a whole. For the Saint Louis metro area, the estimated population loss associated with the earnings tax is 11,200 people (0.4 percent of the 2000 total). For the Kansas City metro area, the estimated population loss from the earnings tax is 16,600 people (0.9 percent of the 2000 total). To put these estimates into perspective, note that the populations of the Saint Louis and Kansas City metro areas grew by 114,209 and 199,296, respectively, between 2000 and 2010. According to these estimates, therefore, if their central cities did not impose earnings taxes, population growth would have been about 10 percent higher in the Saint Louis metro area and slightly more than 8 percent higher in the Kansas City metro area.

IV. SUMMARY AND CONCLUSIONS

This study provides updated estimates of the effect of earnings taxes in Saint Louis and Kansas City on population growth in the cities and their surrounding metro areas. My estimates are consistent with the proposition that the earnings taxes had negative effects on growth in the City of Saint Louis and Kansas City, and positive effects on the rest of their metro areas. In net, the estimates indicate that the metro areas lost population because of their central

cities' earnings taxes. To summarize:

- For Saint Louis, about one half (14,700) of the population decline in the City of Saint Louis between 2000 and 2010 is attributed to the city's earnings tax.

- The rest of the Saint Louis metro area is estimated to have seen an increase of about 3,500 people because of the earnings tax, for a net loss of about 11,200 people in the Saint Louis metro area as a whole.

- For Kansas City, the earnings tax is attributed with cutting the city's population growth in half. Specifically, the city's population in 2010 was about 18,700 lower than it would have been in the absence of the tax.

- Although the rest of the Kansas City metro area is estimated to have seen a small increase in population because of the earnings tax (about 2,100 people), the net effect is that there were about 16,600 fewer people in the metro area.

Given the significant negative relationship between earnings taxes and growth in Saint Louis City and Kansas City, and the need to raise revenue to finance essential services, it is natural to ask what the cities should do instead. The answer to this question has two parts: First, because the estimation shown previously demonstrates that other cities raise revenue in less deleterious ways than do Saint Louis City and Kansas City, much can be learned from the experience of other cities. Second, in writing two papers outlining how to replace the earnings taxes in the City of Saint Louis and Kansas City, Joseph Haslag has already done much of the heavy lifting.[15]

Howard J. Wall is the director of the Hammond Institute for Free Enterprise and the Center for Economics and the Environment at Lindenwood University.

For Kansas City, the estimates indicate that population growth would have been 8.4 percent (36,900 people) instead of 4.1 percent (18,200) if the city did not have an earnings tax—a loss of 18,700 people over the decade.

NOTES:

For the Saint Louis metro area, the estimated population loss associated with the earnings tax is 11,200 people (0.4 percent of the 2000 total).

[1] Barnett, Jeffrey L., and Phillip M. Vidal. "State and Local Government Finances Summary: 2011." U.S. Census Bureau, 2013.

[2] Property taxes, sales taxes, and income taxes account for, respectively, about 5.6 percent, 8.8 percent, and 14.2 percent of the City of Saint Louis' total revenue and about 8.5 percent, 10.8 percent, and 13.8 percent of Kansas City's total revenue (City of Saint Louis. "Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2012." and City of Kansas City. "Popular Annual Financial Report for the Fiscal Year Ending April 30, 2013."). Note that these numbers are percentages of revenue from all sources. It is often claimed that the earnings tax accounts for about 30 percent of the City of Saint Louis' revenues and 20 percent of Kansas City's revenues. The 30 percent figure for Saint Louis is actually earnings tax revenue as a share of general funds revenue, which is less than half of total revenue. The 20 percent figure for Kansas City is actually the share of revenue from governmental activities only, which excludes revenue from water, sewer, and aviation.

[3] Wall, Howard J. "New Estimates of the Effects of City Earnings Taxes on Growth." Show-Me Institute Essay, March 2011. View online here: http://showmeinstitute.org/publications/essay/taxes/1035-new-evidence-of-the-effects-of-city-earnings-taxes-on-growth.html.

[4] Haslag, Joseph. "How an Earnings Tax Harms Cities Like Saint Louis and Kansas City." Show-Me Institute, Policy Study No. 1, March 2006. View online here: http://showmeinstitute.org/publications/policy-study/taxes/343-how-an-earnings-tax-harms-cities.html.

[5] Henchman, Joseph, and Jason Sapia. "Local Income Taxes: City- and County-Level Income and Wage Taxes Continue to Wane." Tax Foundation Fiscal Fact No. 280, April 31, 2011. Note that I included only those cities that imposed taxes on employees and whose taxes were not simply small nominal amounts per worker.

[6] It should be noted that some cities impose different tax rates on residents and non-residents and that the higher rate is usually applied to residents. I use the rates on residents because I am interested in the effect of the taxes on population. Also, to control for regional, historic, and other factors that affect both growth and the tendency toward using earnings taxes, I only consider states in which one or more city has an earnings tax.

[7] Once Louisville is excluded, there were no qualifying cities in Kentucky that were in the same metro area.

[8] Local taxes in Indiana are levied at the county level rather than the city level. To account for this, I simply assigned the relevant county tax rate to each city within the county's borders.

[9] Many of the cities changed their tax rates as some time during the decade, so the tax variables for each city are the average of the tax rates for 2000 and 2010.

[10] Fee, Kyle, and Daniel Hartley. "Urban Growth and Decline: The Role of Population Density at the City Core." Federal Reserve Bank of Cleveland Economic Commentary, December 2011. View online here: http://www.clevelandfed.org/research/commentary/2011/2011-27.cfm.

[11] This was tested for and rejected by Lisa Gladson and Jack Strauss, but they did not account for different levels of earnings taxes because they used a dummy variable to indicate the existence of an earnings tax (Gladson, Lisa, and Jack Strauss. "The Earnings Tax: A Panacea or Red Herring to Economic Growth." Simon Center for Regional Economic Forecasting, Saint Louis University, 2010).

[12] That is, a likelihood-ratio test would fail to find that the models are statistically distinct.

[13] Specifically, a likelihood-ratio test rejects the null hypothesis that the restrictions are statistically unimportant to the estimation.

[14] The populations of the Saint Louis and Kansas City metro areas outside of their central cities were 2.35 million and 1.39 million, respectively, in 2000.

[15] Haslag, Joseph. "How to Replace the Earnings Tax in Saint Louis." Show-Me Institute Policy Study Number 6, January 2007. View online here: http://showmeinstitute.org/publications/policy-study/taxes/350-how-to-replace-the-earnings-tax-in-saint-louis.html. Haslag, Joseph. "How to Replace the Earnings Tax in Kansas City." Show-Me Institute Policy Study Number 6, January 2007. View online here: http://showmeinstitute.org/publications/policy-study/taxes/353-how-to-replace-the-earnings-tax-in-kansas-city.html.

For the Kansas City metro area, the estimated population loss from the earnings tax is 16,600 people (0.9 percent of the 2000 total).

Appendix: Alternative Specifications

	Full Model		Linear T_i		Stripped Model	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Earnings tax rate (t_i)	-4.226	-2.48	-4.425	-2.67	-3.823	-2.87
Intra-metro tax differential (T_i)	1.108	0.35	-1.682	-1.61	0.590	0.85
Intra-metro tax differential squared (T_i^2)	-0.959	-1.03				
Initial population (N_i)	-1.583	-1.48	-1.622	-1.51	0.072	0.48
Initial density (D_i)	-10.509	-0.25	-11.021	-0.26	-8.962	-0.21
Interaction of population and density ($N_i \times D_i$)	6.750	1.70	6.936	1.74		
Initial share of metro population (S_i)	-0.141	-2.37	-0.150	-2.55		
Initial manufacturing share (M_i)	-0.287	-1.41	-0.297	-1.50	-0.297	-1.43
Common intercept	16.718	2.66	17.518	2.94	10.892	2.43
Joint test of T_i (p-value)	0.083		na		na	
R²	0.259		0.257		0.200	
Adj R²	0.189		0.194		0.139	
log-likelihood	-753.403		-753.647		-760.584	

Standard errors are corrected for heteroskedasticity. The estimates of the state effects, which are statistically significant, are suppressed for space considerations.

4512 West Pine Blvd. I Saint Louis, MO 63108 I 314-454-0647 I www.showmeinstitute.org