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# **THE REVENUE IMPACTS OF A CITY INCOME TAX FOR ANN ARBOR**

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# 1 Introduction

Like most Michigan cities, Ann Arbor depends largely on the property tax for its general fund revenues. Under the state's Uniform City Income Tax Act (UCITA), however, the city is permitted to levy an income tax of up to 1 percent on residents and businesses combined with a tax on nonresidents working in the city at a rate not to exceed one-half the resident rate. Currently, twenty-two Michigan cities have such an income tax. If Ann Arbor were to adopt an income tax, the city would reduce property taxes by the amount of the general operating millage (currently 6.4515 mills), as required by the city charter.

This study estimates the revenue impacts resulting from enacting an income tax. It follows the tradition of previous studies but uses newly available data and extends previous analyses.<sup>1</sup> The study estimates overall revenue implications, identifies winners and losers, evaluates the impacts on Ann Arbor businesses, and considers the experiences of other cities in administering a local income tax. The report also determines the income tax rate that brings about revenue neutrality.

While an income tax would have immediate revenue implications, revenues could change in the future based on changing economic conditions. To account for fluctuations in the business cycle, the study develops a forecasting model of income tax revenues over time. The forecasting model investigates the determinants of Ann Arbor income growth and develops projections of revenues to the year 2006.

The organization of the report is as follows: Chapter 2 outlines the background of the prospective income tax in Ann Arbor. In particular, it describes the history, basics, and legal aspects of the city income tax in Michigan. It also describes Ann Arbor voters' previous rejection of an income tax in 1969 and 1972.

Chapter 3 describes the experiences of other cities with their income taxes. These experiences in adopting and administering an income tax have important implications for the city of Ann Arbor. As such, the section describes the general pattern of adoption and reactions of residents and businesses to the tax, the revenue collected by these cities, the processes through which cities collect and enforce the income tax, and comments from cities that have elected not to enact an income tax. The chapter also provides estimates of Ann Arbor's cost of administering an income tax and describes options for collecting and enforcing the tax.

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<sup>1</sup> See, for example, Staff of the City Administrator, "City of Ann Arbor Income Tax Feasibility Study," 1993; Daniel R. Fusfeld, "Should the City of Ann Arbor Levy an Income Tax?" 1991; and Jeff White, "A Local Income Tax in Ann Arbor: Revenue Panacea, Political Suicide, or Both?" 1994.

Chapter 4 provides the revenue impacts of an income tax in Ann Arbor through the year 2006. The chapter describes the key assumptions and methodology used in developing these revenue estimates. It also provides estimates for a range of possible tax rates and exemptions and economic scenarios.

Chapter 5 describes the relative tax burden on residents, nonresidents, and businesses. The chapter estimates these impacts by comparing tax payments under the current property tax system with those under a system of combined property tax and income tax, adjusting for state income tax credits and federal income tax deductions. In particular, the section identifies winners and losers following a shift to the latter system. Among the groups considered are homeowners, renters, seniors, students, and incoming commuters.

Chapter 6 describes the implications of an income tax on Ann Arbor businesses. The chapter describes effects of the income tax on business growth and employment and discusses likely reactions of businesses to the tax. Also included is a detailed breakdown of the effect of the tax on the various types of businesses.

## 2 Background

The city income tax in Michigan has been in existence since the early 1960s. Back in 1962, Detroit and Hamtramck became the first Michigan cities to adopt an income tax. Then in June of 1964, the Michigan state legislature enacted UCITA -- PA 284. This act enables Michigan cities to levy income taxes and requires cities that choose to levy such taxes to comply with all provisions contained in the act. Twenty more cities adopted an income tax under the provisions of UCITA, fourteen between 1964 and 1972 and six later on. Ann Arbor itself considered an income tax, voting it down in 1969 and 1972.

Under the provisions of UCITA, the tax may be levied as follows:

For city *residents*, regardless of the geographic source of income, the tax can be levied at a rate of up to 1 percent on:

- wages and salaries;
- a distributive share of the net profits of a resident owner of an unincorporated business or enterprise wherever it conducts business activities; and
- dividends, interest, net capital gains, net profits from property rental, and other income.

Nontaxable income for city residents includes:

- gifts and bequests;
- proceeds of insurance, annuities, pensions and retirement benefits;
- welfare relief, unemployment benefits, and worker's compensation or similar payments;
- amounts received by charitable, educational and other similar nonprofit organizations;
- interest from obligations of the United States, the states or subordinates units of government of the states, and gains or losses on the sales of obligations of the United States;
- net profits of financial institutions and insurance companies; and
- compensation received for services in the U.S. armed forces.

For *nonresidents*, the tax can be levied at a rate of up to 0.5 percent on:

- wages and salaries for work done in the city;
- a distributive share of the net profits of a nonresident owner of an unincorporated business or enterprise as a result of business activities conducted in the city; and
- the net capital gains from the sale of, and net profits from the rental of, property located in the city.

For *corporations* (i.e., incorporated businesses), the tax can be levied at a rate of up to 1 percent on taxable net profits (as defined in the federal tax code) of business activities conducted in the city. For corporations, no deduction can be allowed for net operating and capital losses sustained prior to the effective date of the tax or for any aspects of the city income tax itself. Finally, corporations may deduct income or excess profits taxes imposed by a foreign country or U.S. possession and ordinarily taxable under the federal tax code.

For corporate income, UCITA provides three bases for determining “activity in the city.” The main basis, referred to as the “business allocation percentage method,” calls for determining the in-city percentages of a corporation’s property, payroll, and sales. The straight average of these percentages, applied to *total* taxable income, is considered to be the income derived from activity in the city. Two alternate bases involve other accounting methods and require city approval.

*Unincorporated businesses* otherwise subject to the tax as either a sole proprietorship or partnership are not taxable as either. Instead, individuals responsible for the business are to be taxed based only on their separate and individual capacities under the following criteria:

- A resident proprietor or partner is taxable upon his or her entire distributive share of net profits of the business, regardless of the location of business activities.
- A nonresident proprietor or partner is taxable upon his or her entire distributive share of the portion of the net profits attributable to activities conducted in the city.

All unincorporated businesses owned by two or more people may elect to compute and pay the tax due with respect to each owner’s share of the net profit of the business. In other words, such businesses can elect to pay the tax owed by their owners.

### **Other Provisions of the Tax**

UCITA delineates specific *tax rates*. First, the nonresident rate cannot exceed one-half the resident rate. Second, for cities initially levying the tax after 1989, the rate must be less than or equal to 1 percent for residents and corporations. A 1995 amendment specifies that rates *under* 1 percent are permitted.

There are two exceptions to the 1 percent *maximum* rate, neither of which applies to Ann Arbor.<sup>2</sup> First, for cities with a population of greater than one million, the act provides for rates of up to 3 percent and 2 percent for residents and corporations respectively. Second, for cities enacting the tax prior to 1989 and falling into other specific population criteria (between 140,000 and one million or between 65,000 and 100,000 in a county of less than 300,000), the act provides for rates of up to 1.5 percent for residents and corporations. At present, only Detroit fits the first exception, and only Grand Rapids and Saginaw fit the second exception.

UCITA also permits *personal exemptions*. For both residents and nonresidents, \$600 is the minimum amount for self, spouse, and dependents under the rules for determining exemptions and dependents as provided in the federal internal revenue code. For self and spouse,

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<sup>2</sup> Two historic exceptions to the 1 percent rate were available within a limited time frame in the late 1980s. One, allowing for up to 2 percent for residents and corporations, required a population of less than one million plus referendum approval and a series of millage maxima. The other, allowing for up to 1.4 percent on residents and corporations, required population greater than 50 thousand and recent annexation of a geographic area.

additional exemptions may be included for being age 65 or older, blind, deaf, or disabled. UCITA does not identify a maximum amount for exemptions. Moreover, cities may provide for exemption from the tax altogether if a person's gross adjusted income is less than a given amount.

UCITA requires *payroll withholding*. The city is required to provide withholding tables establishing amounts to be withheld for various tax rates, wage brackets, numbers of exemptions, and pay periods. Employers in the city are required to withhold city income taxes from employees in accordance with uniform guidelines and to file a quarterly return, furnished by the city, including payment of the full amount of tax withheld for the quarter. Employers are further required to provide an "information form" for each employee from whom city income taxes were withheld (usually a copy of the federal W-2 form).

UCITA also specifies that a resident's *place of work takes precedence in income tax liability*. If an individual lives and works in two different cities and both cities levy an income tax, the individual is liable first for the nonresident rate of his or her place of work. Then for this place of residence, liability is limited to the difference between the place-of-work rate and the resident rate. For example, if an Ann Arbor resident commutes to a city levying a 0.5 percent nonresident rate, he or she would be liable to that city first and then to Ann Arbor for the difference between 0.5 percent and Ann Arbor's resident rate. On the other hand, an Ann Arbor resident commuting to work in the city of Detroit would pay the Detroit nonresident rate of 1.5 percent and then have zero income tax liability to the city of Ann Arbor. This is because Detroit's nonresident rate is higher than Ann Arbor's maximum 1 percent resident rate.

UCITA permits city councils to adopt an income tax by ordinance. However, with the adoption of the Headlee Amendment to the Michigan Constitution in 1978, adoption became more complicated. Under the Headlee Amendment, cities are required to seek voter approval in order to increase property and other local taxes "above the limitations specified." In Ann Arbor, a referendum, similar to the ones held in 1969 and 1972, presumably would be required to adopt an income tax.

## **New UCITA Amendment**

As of December 1996, Public Act 478, an amendment to UCITA, permits an optional agreement between the state and any Michigan city that would allow the state to collect and administer the income tax of the city. The rationale behind state administration is that the state has better, and more access to, information relevant to city income tax collection and enforcement than individual cities. The amendment does not specify a cost for the optional service of state administration; however, it does specify a list of provisions required for agreements between a city and the state. This list includes provisions related to "administrative and legal costs" as well as "termination of the agreement by either party."

## **Ann Arbor Income Tax History**

The city of Ann Arbor has placed an income tax referendum before voters twice: in 1969 and 1972. On both occasions, increased revenue was the basis for the proposal, and on both occasions voters rejected the tax.

### **1969 Vote**

In 1969, a citizen committee was formed to study the income tax proposal. This committee contained such representatives as university professors, local businesspeople, and ex-city councilors. The committee had the self-appointed task of conveying the positive reasons for adopting an income tax.

About three weeks before the vote, the Ann Arbor Republican party expressed opposition to the plan. Its main concern was that the city did not need to generate extra revenue. The Ann Arbor Chamber of Commerce also recommended a "no" vote based on equity concerns and called for an exhaustive study of how the tax would affect all city residents. Finally, the Ann Arbor Board of Realtors also expressed opposition.

The vote took place in a special election held on November 3, 1969. The income tax was defeated by a wide margin of 22 percentage points: 61 to 39. Twenty-six of the city's thirty precincts voted it down. Voting was not along party lines, as both Republicans and Democrats voted against the income tax in nearly equal numbers. Precincts with large numbers of single family homeowners voted strongly against the income tax, while precincts made up predominantly of apartments were not as heavily in opposition.

As a result of fluctuations in the amount of property tax reduction in the 1969 proposal (originally stated as 9.0 mills, then later reduced to 7.5 mills) an amendment to the city charter stated that if an income tax ever were adopted, it would replace the general operating levy portion of the property tax. This amendment was approved by 62 percent of voters in 1969.

### **1972 Vote**

By 1971 the income tax issue was being discussed again. Prior to the 1972 vote on the tax proposal, the city of Ann Arbor appointed a twenty-member citizen committee to study pertinent issues. In its report, the committee was evenly split on whether or not the city should adopt an income tax. Points raised against the proposal included doubt about projections of a serious gap between revenues and expenditures in the next year and potential mismanagement by city departments.



On February 21, 1972, the proposal was rejected by voters. The margin of defeat was closer than in 1969, but still strongly against the tax at 59 percent to 41 percent. It was defeated in thirty of the city's thirty-five precincts and in all five wards. During the debate leading up to the 1972 vote, many of the same issues were raised that had been discussed in 1969. Voters again believed that the income tax would generate more revenues than expenditures dictated. As in 1969, a revenue-neutral tax was not discussed.

### 3 Other Cities

Currently, twenty-two Michigan cities, representing 20 percent of the state population, collect an income tax. There is significant range in population size: four of the six cities larger than Ann Arbor have an income tax, yet half of the twenty-two cities with a tax have populations smaller than 20,000. The largest city with an income tax is Detroit and the smallest is Grayling. Most of the cities are outside of metropolitan Detroit; the exceptions are Detroit itself, Pontiac, Highland Park, and Hamtramck. While the cities vary in geographic size, population, and tax base composition, some useful comparisons to Ann Arbor can be drawn.

#### Pattern of Adoption

Approximately three-quarters of the cities, including the six largest, initiated the local income tax between 1962 and 1972. This ten-year period began with Detroit and Hamtramck's initial enactment followed by the 1964 adoption of UCITA.

The longer a city income tax has been in place, the less knowledge the current administration seems to have of its adoption history. Of the thirteen with historical knowledge, five (Battle Creek, Flint, Ionia, Muskegon, and Port Huron) *replaced an existing property tax* with the new income tax. Most of these cities reported little opposition to the change. For example, the income tax increase in Battle Creek was actually initiated by the downtown business community to replace non-school property tax millage. For the other eight cities with historical knowledge, there was no property tax reduction. Five (Albion, Grand Rapids, Grayling, Hudson and Portland) *earmarked* income tax revenues for basic city services such as roads, parks, police, fire and other capital improvements. Grand Rapids voted in 1995 to raise its rate of taxation for additional police funding. These cities also reported little opposition to the transition, especially once the new revenues were earmarked. The other three cities (Jackson, Big Rapids, and Springfield) *assigned the incremental revenue to their general funds*. Jackson intended to reduce property taxes but has not done so to date.

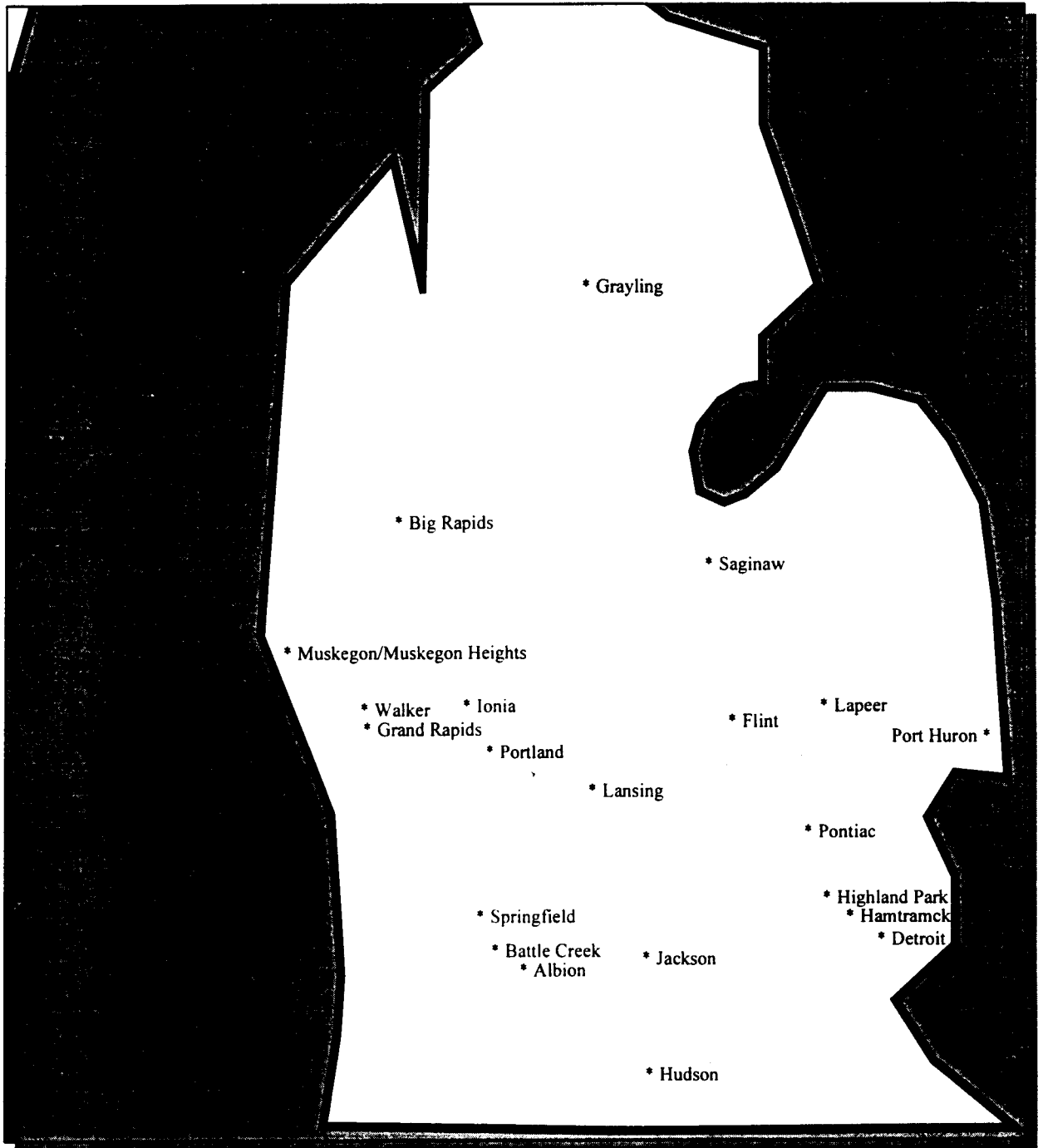
Fewer than one-half of the cities were able to provide the reasons they initially enacted a local income tax. For those that did cite reasons, the common factor was a need for new revenue. The specific basis for needing additional revenue varied. Some cities reported either a shrinking tax base due to poor economic conditions or heavily industrialized/commercialized areas with extensive use of city services by nonresidents. For example, Detroit and Flint experienced industrial tax base losses resulting in difficulty funding public services. Others reported that capital improvements (particularly roads) were greatly needed, in some cases due to commercial areas with heavy use of roads by nonresidents.

One city (Portland) reversed its income tax, originally enacted without a referendum, after only one year due to taxpayer discontent. But then Portland reversed again, reinstating its income tax following a referendum, this time earmarked for roads.

Table 3-1 contains a summary of current income tax rates and exemptions, with cities listed in chronological order of enactment. For each of the four cities with a resident rate above 1 percent, the rate is associated with a current or historic exception to UCITA's 1 percent maximum. Exemptions range from \$600 to \$1,000 though Saginaw allows seniors to exempt \$2,000. As indicated previously, \$600 is the minimum amount written into UCITA. The data in the table show that cities with higher rates do not always have higher exemptions. Figure 3-1 provides a map of these Michigan cities.

<b>Table 3-1: Michigan Cities With an Income Tax</b>						
City	Year Enacted	1990 Population	Resident (%)	Nonresident Rate (%)	Corp. Rate (%)	Exemption Amount (\$)
Detroit*	1962	1,027,974	3.0	1.5	2.0	600
Hamtramck	1962	18,372	1.0	0.5	1.0	600
Flint	1964	140,761	1.0	0.5	1.0	600
Saginaw*	1964	69,512	1.5	0.75	1.5	1000; 2000 if 65+
Highland Park**	1965	20,121	2.0	1.0	2.0	600
Lapeer	1967	7,759	1.0	0.5	1.0	600
Battle Creek	1967	53,540	1.0	0.5	1.0	700
Grand Rapids*	1967	189,126	1.3	0.65	1.3	750
Pontiac	1968	71,166	1.0	0.5	1.0	600
Lansing	1968	127,321	1.0	0.5	1.0	600
Port Huron	1969	33,694	1.0	0.5	1.0	600
Big Rapids	1970	12,603	1.0	0.5	1.0	600
Jackson	1970	37,446	1.0	0.5	1.0	600
Albion	1971	10,066	1.0	0.5	1.0	600
Hudson	1971	2,580	1.0	0.5	1.0	1,000
Grayling	1972	1,944	1.0	0.5	1.0	600
Portland	1984	3,889	1.0	0.5	1.0	1,000
Walker	1988	17,279	1.0	0.5	1.0	750
Springfield	1989	5,582	1.0	0.5	1.0	600
Muskegon Heights	1990	13,176	1.0	0.5	1.0	600
Muskegon	1993	40,000	1.0	0.5	1.0	600
Ionia	1994	6,000	1.0	0.5	1.0	700
* Rates associated with <i>current</i> UCITA exceptions to 1 percent maximum rate.						
** Rates associated with <i>historic</i> UCITA exception to 1 percent maximum rate.						

Figure 3-1: Cities Currently Using An Income Tax



## Cities Maintaining A Property Tax Exclusively

Several large cities without an income tax were contacted to determine if they had considered an income tax. Three cities in metropolitan Detroit reported that they did not need an increase in revenue either because they had not reached their property tax rate cap, were experiencing rapid increases in property values, or that the city services could be provided at relatively low cost. Outside of metropolitan Detroit, Kalamazoo and East Lansing, each containing a large percentage of tax exempt property, have considered an income tax on multiple occasions. In Kalamazoo, a ballot proposal was defeated in 1992, but the city is preparing to review the issue again. East Lansing has not put the issue on the ballot. When last viewed, in 1992, its estimates of net additional revenue, assuming 1 percent and 0.5 percent rates, included a higher net tax burden on most residents even with a property tax rollback, which was not desired. The city perceived that establishing rates lower than the standard would require unusual efforts with the state legislature. It also had concerns about taxing students and had not reached its millage cap. As mentioned, a 1995 amendment made lower rates an explicit option and seemingly easy to institute.

## Revenue Generated

We gathered data on tax revenue from two sources: (1) 1995-96 data from talks with city administrators; and (2) early 1990s data from the U.S. Census. Table 3-2 uses the 1995-96 data to provide a snapshot of revenue data for all Michigan cities *with an income tax* and reveals the following:

First, for most cities, *total income tax revenue per capita* is in the range of \$130 to \$230; Detroit, with higher rates, is one of the exceptions. For the six larger cities (population of 50,000 or more), the weighted average is \$278, though excluding Detroit it is \$188. For smaller cities, the weighted average is \$147.<sup>3</sup> Per capita income tax revenue reflects a number of factors including: tax rates; exemption levels; income levels; nonresident count; and corporation income.

Second, the total *income tax revenue as a percentage of total city revenues* spans a very wide range. Among the larger cities, the weighted average is 36 percent, ranging from 28 percent in Lansing to 77 percent in Saginaw. Among the smaller cities, the weighted average is 33 percent, ranging from 8 percent in Springfield to 59 percent in Walker.

Third, there again is wide variation by city in the *percentage of revenue sourced from the three key groups of residents, nonresidents, and corporations/businesses*. For example, the percentage attributed to residents is as low as 12 percent in Saginaw and as high as 71 percent in Hamtramck. For the weighted averages, however, large and small cities are comparable, indicating that corporations/businesses generally contribute less than 10 percent with the

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<sup>3</sup> All averages in this chapter are weighted based on population and include only cities for which data were available.

balance roughly divided between residents and nonresidents -- about 45 percent each. The corporate/business percentage is understated to some extent since total revenue was divided only into resident and nonresident classifications for some cities, including Grand Rapids. Nonetheless, within each of these groups, the range is wide.

**TABLE 3-2: MICHIGAN CITIES WITH A LOCAL INCOME TAX**  
**1995-96 Revenue Data**

	1990 Population	Income Tax Revenue per Resident (\$)	Income Tax % of Total City Revenue	% Revenue from Residents	% Revenue from Nonresi- dents	% Revenue from Corp./ Business
<b>LARGE CITIES:</b>						
Detroit	1,027,974	328	27	--	--	--
Grand Rapids	189,126	171	38	75	25	--
Flint	140,761	187	34	40	59	1
Lansing	127,321	198	28	--	--	--
Pontiac	71,166	--	--	--	--	--
Saginaw	69,512	187	77	12	63	25
Battle Creek	53,540	233	36	40	40	20
<b>Wgt Average</b>		<b>278</b>	<b>29</b>	<b>49</b>	<b>44</b>	<b>7</b>
<b>Wgt Average ex. Detroit</b>		<b>188</b>	<b>36</b>	<b>--</b>	<b>--</b>	<b>--</b>
<b>OTHER CITIES:</b>						
Walker	17,279	301	59	28	53	19
Ionia	6,000	233	47	33	60	7
Lapeer	7,759	206	53	--	--	--
Hudson	2,580	167	11	--	--	--
Jackson	37,446	161	36	46	46	8
Muskegon	40,000	153	--	33	66	2
Port Huron	33,694	149	29	58	31	11
Portland	3,889	137	19	--	--	--
Grayling	1,944	137	--	32	55	13
Springfield	5,582	126	8	51	39	11
Big Rapids	12,603	111	35	22	78	--
Albion	10,066	109	28	41	41	18
Hamtramck	18,372	98	31	71	28	1
Highland Park	20,121	22	--	35	50	16
<b>Wgt Average</b>		<b>147</b>	<b>33</b>	<b>44</b>	<b>47</b>	<b>9</b>

For additional revenue perspective and a profile of other cities' characteristics (*whether or not they have an income tax*), we used Census data from the early 1990s to compare revenues and associated measures for Michigan's twenty-five largest cities. There are seven cities with an income tax and eighteen without. As displayed by Table 3-3, the data include measures of tax revenue, wealth, and the importance of nonresident workers.

For total tax revenue, including both property and income taxes, Table 3-3 shows that large cities with an income tax generated a higher level of total 1990-91 tax revenue per capita than cities without -- an average of \$454 per capita versus \$276 per capita. As would be expected, for cities with an income tax, the percentage of tax revenue generated from property taxes is much smaller -- 45 percent versus 96 percent for cities without an income tax.

Essentially, the income tax allowed cities with lower average levels of wealth to collect higher average tax revenue per capita. To verify this relationship we conducted a regression analysis in which we controlled for total property assessment per capita, millage levels, and median income. With these variables held equal, the results indicate that having an income tax was associated with \$156 greater average tax revenue per capita. Details of the analysis are described in Appendix C.

Table 3-3 reveals that all wealth variables were lower on average for the seven cities with an income tax compared to the eighteen without the tax. First, the weighted average of 1986 assessed property values per capita was only half as great in cities with an income tax -- \$6,935 versus \$14,207. Values ranged from \$5,098 in Detroit to \$11,250 in Flint. If Detroit is excluded, the weighted average per capita for cities with a tax was \$9,854 -- 30 percent less than the average of cities without an income tax. Cities without an income tax ranged from \$7,787 in Westland to \$24,279 in Troy.

Second, the incidence of poverty was higher in cities with an income tax than in those without. Again, this correspondence seems attributable to the fact that the income tax allows these lower income cities to raise more revenue. For cities with an income tax, the percentage of families below the poverty level was a double-digit figure for each city; the range included a low of 13 percent in Grand Rapids to a high of 28-29 percent in Flint, Detroit and Saginaw. For cities without an income tax, the percentage was a single-digit figure for all but three cities (19 percent in Kalamazoo, 11 percent in Taylor, and 11 percent in East Lansing).

Third, median household income was lower in cities with an income tax -- ranging from \$17,736 in Saginaw to \$26,809 in Grand Rapids. For cities without an income tax, the range was \$23,207 in Kalamazoo to \$55,407 in Troy. While presence in metropolitan Detroit does seem positively associated with income, the association is far from perfect.

With regard to the importance of nonresident workers, data were available only for populations of 100,000 or more. The count of total city workers per resident incorporates the net effect of commuters both into and out of the city. This measure was found to be similar for cities with and without an income tax. As shown in Table 3-3, the norm was .7 to .8 workers per resident for both types of cities.

**TABLE 3-3: MICHIGAN'S 25 LARGEST CITIES, Early 1990s Census Data**

		REVENUE		MEASURES OF WEALTH			COM-
		1990-91	1990-91	1986	1989 %	1989	MUTING
		Per Capita	Property	Assessed	Families	Median	
		Total City	Taxes as	Property	Below	House-	1989
		Tax	% of Total	Value Per	Poverty	hold	Workers
	1990	Revenue	City Tax	Capita*	Level	Income (\$)	Per City
	Population	(\$)	Revenue	(\$)			Resident
<b>WITH INCOME TAX:</b>							
Detroit	1,027,974	513	38	5,098	29	18,742	
Grand Rapids	189,126	293	50	9,153	13	26,809	0.70
Flint	140,761	317	49	11,250	28	20,176	0.75
Lansing	122,700	328	49	9,885	17	26,398	0.76
Pontiac	71,166	573	73	10,676	24	21,962	
Saginaw	69,512	285	98	8,002	29	17,736	
Battle Creek	53,540	592	70	9,909	14	25,306	
<b>Wgt Average</b>		<b>454</b>	<b>45</b>	<b>6,935</b>			
Average ex. Detroit		<b>360</b>		<b>9,854</b>			
<b>WITHOUT INCOME TAX:</b>							
Warren	144,864	300	97	15,346	5	35,980	0.70
Sterling Heights	117,810	244	96	12,705	3	46,470	0.42
Ann Arbor **	109,592	374	97	13,082	6	33,344	0.79
Livonia	100,850	288	93	16,492	2	48,645	0.75
Dearborn	89,286	504	95	20,626	8	34,909	
Westland	84,724	216	97	7,787	6	34,995	
Kalamazoo **	80,277	259	97	8,834	19	23,207	
Southfield	75,728	530	97	21,598	4	40,579	
Troy	72,884	418	96	24,279	2	55,407	
Farmington Hills	74,652	279	96	16,726	2	51,986	
Taylor	70,811	317	97	8,173	11	32,659	
St. Clair Shores	68,107	219	97	11,074	3	36,929	
Royal Oak	65,410	272	94	11,311	3	36,835	
Wyoming	63,891	159	93	12,120	5	31,103	
Rochester Hills	61,766	213	90	--	2	54,996	
Roseville	51,412	242	97	10,094	5	32,337	
East Lansing **	50,677	166	94	--	11	24,716	
Portage **	41,042	244	96	--	3	39,045	
<b>Wgt Average</b>		<b>276</b>	<b>96</b>	<b>14,207</b>			

\* Not limited to residential and includes tax-exempt property

\*\* Not metropolitan Detroit



## Identification of Taxpayers & Collection Enforcement

The primary method of identifying *nonresidents* is W-2 forms, which UCITA requires employers to submit. Most cities consider this method to work well except for workers earning income in the city whose employers are not based in the city. To identify *residents*, cities utilize the same employer-submitted W-2 forms but also acquire state income tax return data to identify residents working outside the city. The state data, sorted by zip code, are compared with city returns. Some cities augment this process by crosschecking resident payment information with city assessor records, property tax records, voter records, water bills, or other utility bills. Despite these resident identification methods, many cities reported challenges in collecting taxes from residents who work outside of the city.

*Corporations and businesses* are identified through local registration information including registration for withholding city income taxes. In one case, this information is supplemented by crosschecking building permits. Identifying businesses located outside the city that conduct business within the city is difficult. Moreover, by utilizing tax breaks, many corporations report little or no net income. Therefore, for most cities, corporate returns constitute a small percentage of revenue. To ensure compliance and accuracy, some cities audit businesses within the city or require businesses to submit the first four pages of their federal returns with the city income tax returns.

*Enforcement* efforts have varied widely. Most cities have some staff dedicated to the enforcement process and begin by sending out reminder letters. More aggressive enforcement includes the use of collection agencies, and criminal and/or civil prosecution. Most cities have done little to estimate compliance rates, but those concentrating more resources on taxpayer identification and enforcement report higher compliance. The evidence suggests increased enforcement costs can be more than offset by additional revenue. For example, Grand Rapids reports that the additional revenue from enforcement pays for almost 90 percent of the entire income tax administration budget.

Administrators from Michigan cities with an income tax have formed an ad hoc group called the Michigan Association of City Income Tax Officials. This association, which meets quarterly, is intended to promote professional development and efficiency in administering a local income tax. At present, it is reported to be working on a venture to improve resident identification by centralizing information collection.

## Administration Costs

After establishing an initial ordinance, administering a local income tax includes a number of annual, if not ongoing, activities that represent administration costs. For example, each city creates a set of forms and instructions for residents, nonresidents, corporations, and unincorporated businesses. Provisions must be made within forms for partial-year residents and for residents who are to receive a refund based on nonresident payments made to a different city with an income tax, and all tax payments and refunds must be processed. For employers' payroll withholding, each city is required to administer registration for withholding in addition to providing withholding forms and instructions, processing quarterly payments, and reconciling payments at year end.

The processes of identifying taxpayers and enforcing payment includes an additional set of activities as described above. Nearly all cities purchase state income tax data to assist in enforcing filing requirements. Other enforcement costs include the administration of notices and legal activities.

Considering all twenty-two cities, total income tax *administration costs* represent between 1.5 percent and 10 percent of income tax revenue. Table 3-4 contains data for the six larger cities and reveals that costs range from 1.0 percent to 3.1 percent of revenue for these cities. The amount of \$325,000 to \$400,000 appears to represent a minimum cost for a city with a population of 50,000 or more.

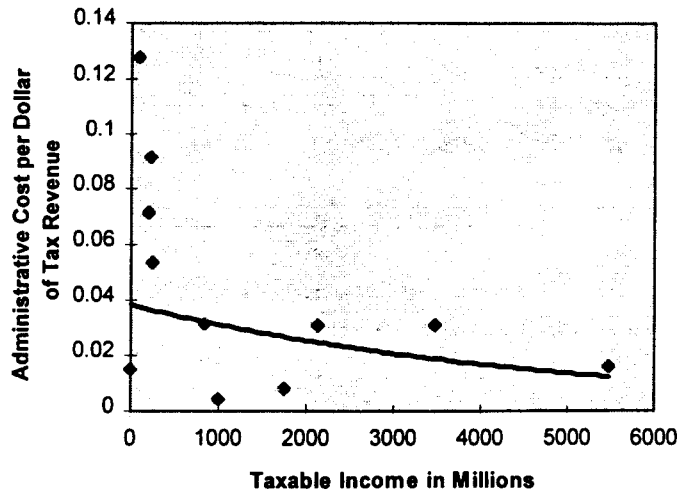
**TABLE 3-4: Cities' 1995-96 Income Tax Administration Costs**

City	Income Tax Revenue (\$000)	Cost (\$000)	Cost as a % of Revenue	Admin Cost per Resident (\$)
Detroit	337,000	3,300	1.0	3.21
Grand Rapids	32,977	1,000	3.1	5.29
Lansing	25,222	400	1.6	3.14
Flint	26,260	800	3.0	5.68
Saginaw	13,000	325	2.5	4.68
Battle Creek	12,500	380	3.0	7.10

To estimate Ann Arbor's likely administration costs, we generated a cost curve utilizing data from other cities. Figure 3-2 illustrates the relationship between administrative cost per dollar of income tax revenue and a city's total base of taxable income. The line represents cost regressed upon taxable income, and the diamond-shaped nodes represent actual data points for the cities that made both of these variables available. Taking into account our assumption of Ann Arbor's total 1995 taxable income data (for residents, nonresidents, and businesses) and the associated projected income tax revenue (all of which is discussed in the balance of the report), the curve indicates that Ann Arbor would have realized 1995 administration costs at approximately 2 percent of income tax revenue, or about \$534,000. Actual costs, of course, would depend upon the city's particular approach to administration in addition to its efficiency relative to other cities.

Of note, this cost estimation assumes local administration as opposed to state administration. However, if Ann Arbor were to enact an income tax and elect to have the state administer it, the estimate could be used by the city as reference when negotiating costs.

**Figure 3-2: Administrative Cost per Dollar of Tax Revenue as a Function of Taxable Income**



## **Interest in State Administration**

Of the twenty-two cities contacted for this study, only Albion expressed interest in having the state administer its income tax program. Albion agreed to participate in a no-cost pilot project to increase revenues while limiting expenses. In the recent past, Albion allocated no funds to enforcement and did not include a full-time income tax administrator, resulting in limited compliance. The city council has been reluctant to spend scarce resources on personnel to improve compliance as the city believed residents would rather dedicate revenues to other projects.

Lansing cited pros and cons to state administration, believing that the state can better collect delinquent taxes but will have a difficult time enforcing the corporation and part-time resident cases. All other cities expressed no interest in state administration. These cities believe they will do a better job of pursuing enforcement and/or that the state will charge more for administration than they are currently spending. (As mentioned previously, the pending amendment does not specify a state administration price but does require a provision for cost within any agreement entered into between the state and a subject city.) Some cities were concerned that the state will implement a mandatory system of collection, believing this would result in lost revenue.

## 4 Revenue Impacts of an Ann Arbor Income Tax

In estimating Ann Arbor tax revenues, we drew basic parameters from the combination of state law (UCITA) and the city charter:

First, UCITA calls for a maximum 1 percent income tax rate for residents and corporations, no more than one-half of the resident rate for nonresidents, and personal exemptions of at least \$600. To establish a baseline, we used these amounts.

Second, in order to enact an income tax, the Ann Arbor city charter calls for both a referendum in which a proposal is accepted by a majority of voters and a reduction in property taxes in the amount of the general operating millage. For 1996-97, the general operating millage is 6.4515 mills out of a total 16.8015 mills for the general fund.<sup>4</sup> Thus enacting an income tax would require the total millage to drop to 10.35 mills, a reduction of 38 percent in total city property tax revenues. It is important to note that *only* the general operating millage would be eliminated by such a change in the tax structure. Other millage rates would not be affected. While millage rates are subject to change, the present schedule is as follows:

<b>Table 4-1: 1996-97 Millage Rates</b>	
General Operating	6.4515
Employee Benefits	1.9060
Refuse Collection	2.5806
<u>Transportation</u>	<u>2.1505</u>
Total Operating	13.0886
Debt	0.9241
Streets	1.9509
Parks (Combined)	0.8379
<b>Total 1996-97</b>	<b>16.8015</b>
<b>Without General Operating Millage</b>	<b>10.3500</b>

Third, in view of these considerations, we prepared revenue estimates for three scenarios. In all cases, we assumed the income tax would begin in 1998 and that current millage rates as shown above would apply. Since a potential problem with an income tax is a cyclical loss in revenues, we created one scenario with normal high employment economic growth and one with a lengthy recession.

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<sup>4</sup> A mill is equal to one-tenth of 1 percent, or one one-thousandth if expressed as a fraction. In 1995-96, the city's General Fund Budget included \$42,137,976 in property taxes associated with 15.8323 mills of a total 16.878 plus \$991,000 in interest and penalties. These property taxes represented 60 percent of total general fund revenues.

- Scenario 1: Current set of property taxes only. Total = 16.8015 mills.
- Scenario 2: Substitute 1 percent income tax (0.5 percent rate for nonresidents), with \$600 exemption, for 6.4515 general operating millage. Total property tax rates then equal 10.35 mills. Normal high employment economic growth.
- Scenario 3: Same taxes as Scenario 2, but assumes economic downturn as of 1998, with the national unemployment rate gradually rising from the 5.6 percent rate of Scenario 2 to 7.6 percent.

We projected annual revenue under these three scenarios through the year 2006 via forecasting models which drew upon data made available by the city and state plus data from the U.S. Census. Complete details regarding our estimation methodology are provided in Appendices D and E. In general terms, this methodology was as follows:

For *annual bases of taxable income*, we started with 1995 income for Ann Arbor residents, as reported to the state with income tax returns, and with 1990 Census data for nonresident income. For business income data, we started with the U.S. Commerce Department's 1992 Economic Census.<sup>5</sup>

To project income data to 1998 terms, we applied average annual income growth rates and a cyclical factor. These factors were derived from a regression analysis which utilized income trend data (for the eleven years ending in 1994) from a report of the State of Michigan Department of Treasury entitled "Income, Income Tax, and Property Tax Credit Data by School District" plus national unemployment data. The analysis projected a 3.04 percent real annual *trend* growth rate of Ann Arbor income (prior to the effects of inflation) and a -.46 *cyclical factor* associated with unemployment. The overall GDP price deflator was projected to rise at the rate of 2.8 percent a year, as has been assumed by the Congressional Budget Office.

For *annual bases of taxable property values*, we started with Ann Arbor city records for the years 1993-1996. Annual rates of growth were projected according to: historic increases caused by new construction and annexations (averaging 1 percent per year in nominal terms); and an estimate of property value appreciation (a 2 percent average for residential property and 1 percent average for commercial property). Of note, appreciation estimates acknowledge Proposal A's annual cap of the Consumer Price Index (CPI) as of 1995 but also consider the range of actual growth rates which are estimated to average less than the CPI for the near term. Additionally, new construction associated with the Downtown Development Authority was subtracted from the tax base.

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<sup>5</sup> It is possible that total income is overstated by up to 3 percent. This is because we were not able to identify the overlap between self-employed individuals within the Household Census data who might also have been included in the Economic Census of businesses (where inclusion requires that one employs others in addition to oneself). If all self-employed individuals were counted in the Economic Census, income would be overstated by 3 percent.

## General Findings

As shown in Figure 4-1 and Table 4-2 below, the inclusion of an income tax leads to higher revenue from the start, and because incomes are expected to grow faster than assessed property values, this difference is projected to grow over time. For Scenario 2 we project an immediate revenue increase of 29 percent versus Scenario 1, rising gradually to an increase of 51 percent in year 2006. For the entire nine-year period the increase is 40 percent.

For Scenario 3 we project an immediate base-year revenue increase of 27 percent versus Scenario 1 -- comparable to the initial increase of Scenario 2. However, the rate of revenue increase under Scenario 3 slows in association with higher unemployment, for a total nine-year increase of 31 percent versus Scenario 1. Over the nine years, Scenario 3 generates 6 percent less revenue than does Scenario 2.

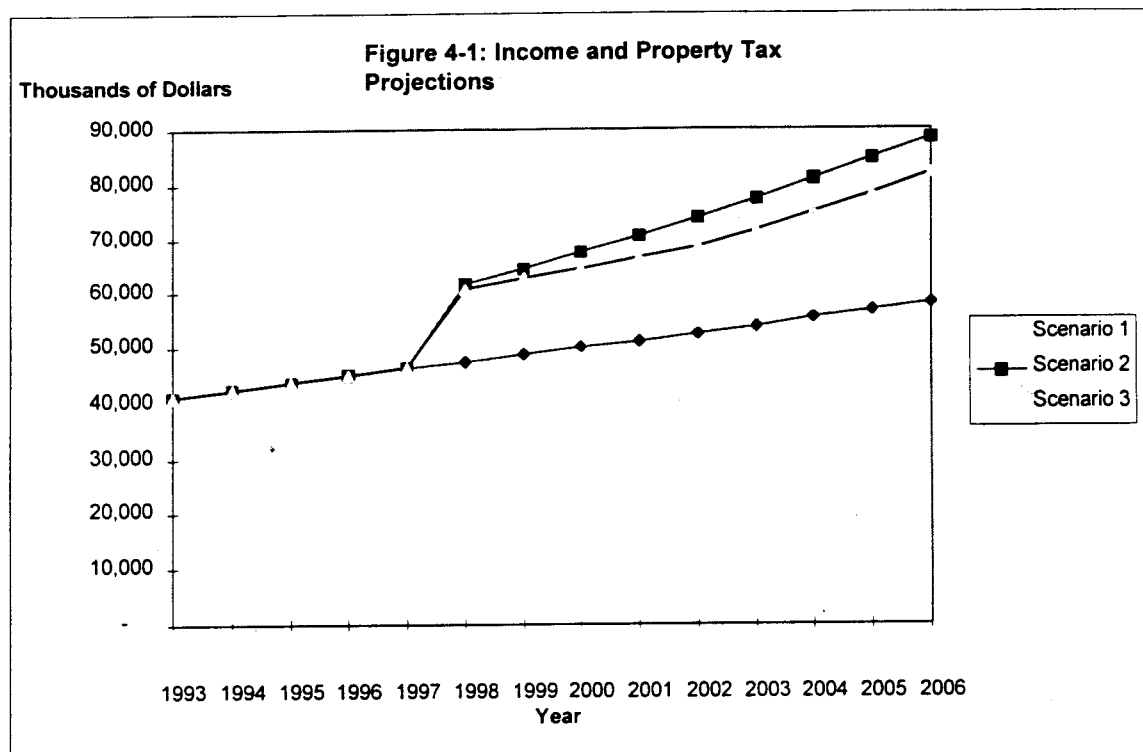


Table 4-2: Total Ann Arbor Property and Income Tax Revenue (Thousands of current dollars)			
	Scenario 1	Scenario 2	Scenario 3
Base Year: 1998	47,382	61,247	60,215
% Gain vs. Scenario 1	--	29	27
Future Year: 2006	58,206	87,791	80,867
% Gain vs. Scenario 1	--	51	39
Nine Years: 1998-2006	473,703	663,704	622,109
% Gain vs. Scenario 1	--	40	31

In 1998, the \$61.2 million revenue projected under Scenario 2 is divided almost evenly between income tax and property tax revenue -- \$32.0 million and \$29.2 million, respectively. The reduction in property taxes is \$18.2 million, and the net revenue increase is \$13.9 million compared to the status quo of Scenario 1. However, by 2006 the split is 59 percent income tax and 41 percent property tax, with a net revenue increase of \$29.6 million versus Scenario 1.

## Alternate Versions of Scenario 2

It is typical for cities enacting an income tax to implement the highest legal rate. Since Ann Arbor's highest legal rates would be 1 percent for residents and corporations and 0.5 percent for nonresidents, these were the initial rates assumed. We also assumed the lowest exemption level of \$600. However, we also conducted sensitivity analysis to determine the revenue effects of a higher exemption level (\$1000) and a lower rate (0.75 percent for residents and corporations; 0.375 percent for nonresidents). As shown in Table 4-3, each of these revisions to Scenario 2 continues to generate additional tax revenue compared to Scenario 1. Moving to a \$1000 exemption (Scenario 2A) represents little change in Scenario 2 revenue projections. However, the lower 0.75 percent resident rate (Scenario 2B) results in about one-half the level of increase versus the basic Scenario 2 rate of 1 percent.

Table 4-3: Alternate Versions of Scenario 2				
Total Ann Arbor Property and Income Tax Revenue (Thousands of current dollars)				
	Scenario 1	Scenario 2: 1.0%; \$600 exemption	Scenario 2A: 1.0%; \$1000 exemption	Scenario 2B: .75%; \$600 exemption
Base Year: 1998	47,382	61,247	60,133	53,232
% Gain vs. Scenario 1	--	29	27	12
Future Year: 2006	58,206	87,791	86,569	74,806
% Gain vs. Scenario 1	--	51	49	29
Nine Years: 1998-2006	473,704	663,704	653,199	570,730
% Gain vs. Scenario 1	--	40	38	20

In light of the different growth paths of income and assessed property values, there is not one income tax rate that would deliver *revenue neutrality* continually. In the base year of 1998, approximate revenue neutrality, using a \$600 exemption, would occur with a tax rate of 0.6 percent for residents and corporations and 0.3 percent for nonresidents. However, we project that this neutral start would turn into a small increase within one year and would result in a 6 percent gain in revenue over the nine-year period of 1998-2006. In principle it would be possible to compute a revenue neutral exemption but we have not done that -- the implication of the Scenario 2A calculation is that this exemption level would be quite high.



## 5 Impacts upon Individuals

This chapter examines how different segments of the population would be affected by a move to a local income tax in the place of general operating property tax millage. It views the specific segments of homeowners, renters, incoming commuters, seniors, and students. A 1 percent tax rate (0.5 percent for nonresidents) is assumed along with a \$600 exemption.

While the projections model in the previous chapter estimates revenues beginning in the first year likely to be affected by the hypothetical policy change (1998), this chapter is written entirely in terms of most recently observed data (1995). The 1995 revenues of Scenario 1 are 89 percent of those in 1998; and revenues of Scenario 2 are 87 percent of those in 1998.

To calculate the *distributional effects* of the proposal on city revenue and on income distribution, two different sources of data were used. For residents, we had access to both Census data and actual 1995 Michigan tax return data. Since the Census data could be easily manipulated to provide subgroup information, while the income tax return data provided a more accurate estimate of the taxes that would actually be collected, the Census data were scaled down to reflect the likely underreporting of income and these numbers were used for the analysis. The Census data also provided information on property values, so we were able to match a household's income with its property value. For incoming commuters, 1990 Census data were utilized; this source provides more reliable population and income information than has been used in previous tax feasibility studies. All 1990 figures were inflated to 1995 bases using the same techniques discussed earlier. We also used state of Michigan and federal tax forms to compute impacts after state tax credits and federal tax deductions. Appendix F describes the methodology for residents and commuters in greater detail.

### General Distributional Impacts

Table 5-1 shows the breakout of impacts on residents, including homeowners and renters, and on nonresidents and businesses, without adjusting for state tax credits or federal deductions. At the 1 percent resident and corporate rate and \$600 exemption level, the only group that sees a net gain from the tax shift is businesses. Even though the average owner may see little change, in aggregate owners experience a net loss, as do commuters and renters, who did not pay a tax before.

Table 5-1: Total Property and Income Taxes By Group (Thousands of 1995 dollars)			
	Scenario 1: 16.8 Mill	Scenario 2: 10.35 Mill Prop. income Tax Plus 1% Income Tax	
Subgroup	Property Tax		Change (%)
Owners	23,451	26,810	14.3
Renters	0	6,941	100.0
Commuters	0	6,794	100.0
Businesses	19,024	13,271	-30.0
<b>TOTAL</b>	<b>42,475</b>	<b>53,816</b>	<b>26.7</b>

## Population Segments in More Detail

The following sections describe in more detail the impact of the 1 percent income tax (0.5 percent for nonresidents) on homeowners, renters, incoming commuters, seniors and students. For these sections, Census income data were not scaled down for underreporting; this is so that these sections can be read from the perspective of individuals (who have the option of reporting income or not) rather than from the perspective of the city. In addition, in these sections we take account of various state income tax credits and federal tax deductions.

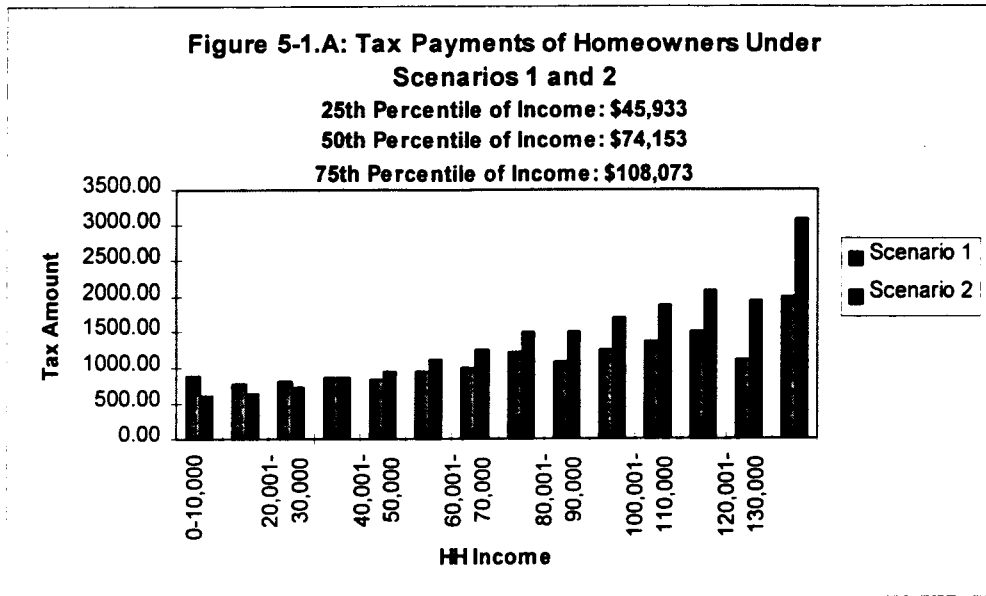
### Homeowners

Overall the city would have received an estimated \$27 million from the 19,385 owned households in 1995 under this income tax plan, in contrast to the estimated \$23 million they received solely in property taxes. This constitutes an estimated 14.3 percent revenue increase in the city's revenues from homeowners.

As for distribution, the median Ann Arbor homeowner has a household income of \$74,153. Currently, low-income homeowners pay a much larger percentage of their income in property taxes than high-income homeowners. The proposed shift in taxes would be more progressive for Ann Arbor homeowners. Figure 5-1.A shows that the inclusion of a 1 percent income tax versus property taxes only would decrease the average tax payment for homeowners whose average household income is less than \$30,000 (approximately the lowest 20 percent of overall Ann Arbor incomes). Those with household incomes ranging from \$30,000 to \$40,000 would see no change in their tax payment. Homeowners with the highest household incomes, in the upper half of Ann Arbor's income distribution, would pay higher taxes with the proposed income tax. The mean difference between the two tax scenarios increases as income increases.

Figure 5-1.B shows the same numbers, after calculating the likely impact of state tax credits and federal tax deductions. Since the state homeowner tax credit affects mainly lower income people (and becomes less of a factor in Scenario 2), while the combination of the state income

tax credit and federal deduction affects mainly high income people (and becomes more of a factor), these net impacts, the best indication of the true impact of the changes on individuals, are not nearly as pronounced as in Figure 5-1A.



## Senior Owners

Ann Arbor's senior citizens are predominantly homeowners (72 percent own a home). There are approximately 5,800 owned households comprised of seniors in Ann Arbor, and those with high property values and low incomes will see a decrease in their tax payments. The 28 percent who rent their dwelling units will see an increase in their taxes in the short run, though the amount is not likely to be high, since most of seniors' income sources are nontaxable.

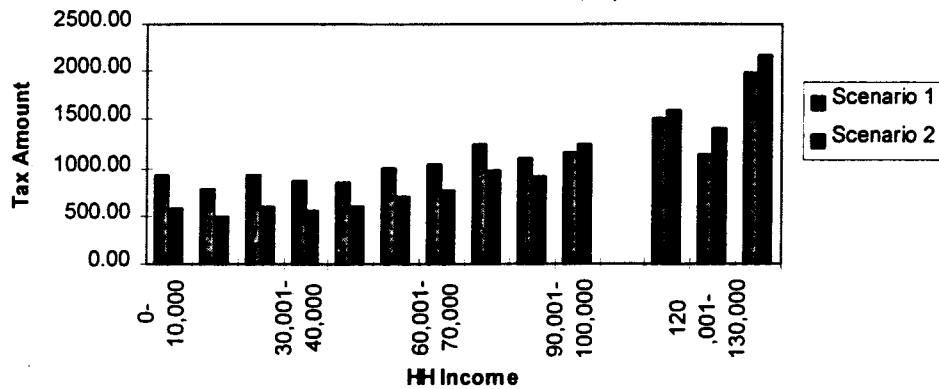
The median senior owner household earns \$59,050 and will see a decrease in their taxes of approximately \$266. This is because most of senior citizens' income comes from Social Security and pensions, which are nontaxable sources of income. Like homeowners overall, senior owners in the lower income ranges would be paying a much smaller percentage of their income under the proposed tax shift, while the wealthiest senior homeowners would be paying a larger percentage of their income in taxes. After deducting the \$1200 personal exemption from this group's total income, the city would receive approximately \$1 million less from senior homeowners under Scenario 2. Figure 5-2.A displays tax payments under Scenarios 1 and 2 based on different senior owner household income levels, while Figure 5-2.B shows, as before, how these distributional shifts become muted in the presence of the state tax credit and federal tax deduction.

**Figure 5-3.A: Tax Payments of Senior Homeowners Under Scenarios 1 and 2**

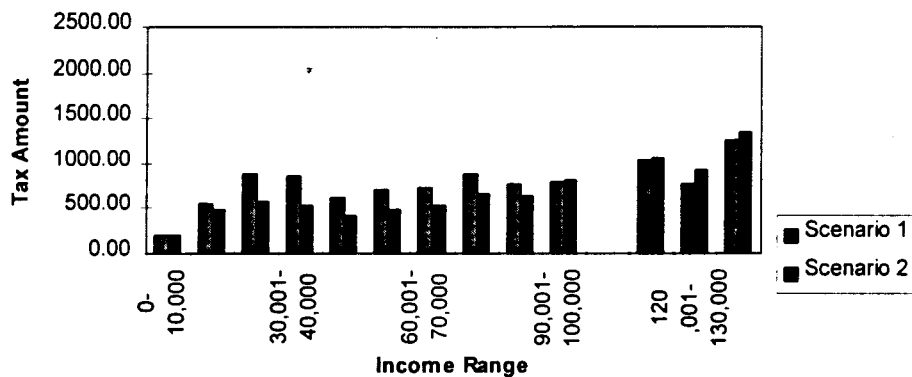
25th Percentile of Income: \$30,996

50th Percentile of Income: \$59,050

75th Percentile of Income: \$91,440



**Figure 5-2.B: Tax Payments of Senior Homeowners, Incorporating State Credits and Federal Deductions**



## Renters

There are approximately 27,500 renter households in Ann Arbor. To begin, we assume that rental prices will not change in the short run. In this event renters will face a higher tax burden until the housing market accommodates the tax shift. Not only will renters continue paying the same monthly rent (part of which is used to pay for property taxes), but they also will be paying 1 percent of their income for city taxes. Hence, renters will be unambiguously worse off in the short run as a result of the tax shift. Low-income renters especially will be affected. The median household income for renters is only \$25,622, and this median household will be subject to a city income tax of approximately \$229. Figure 5-3.A displays income tax payments by renters' household income levels.

The credits and deductions also become more complicated for renters. Since renters are unable to claim a mortgage interest deduction, we have assumed that only high-income renters itemize. Further, since we do not have the data to compute the state property tax credit, and since this credit will be much smaller than for homeowners, we have ignored the homeowner tax credit. Figure 5-3.B then merely differs from Figure 5-3.A by the impact of the state income tax credit. As before, it mitigates the net loss to renters from the switch.

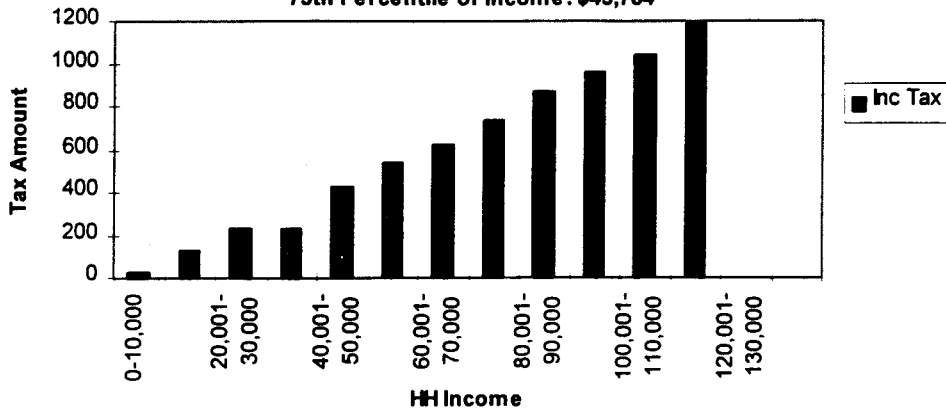
In the long run, there is a strong possibility that the reduction in property taxes will result in slower growth in rents, reducing or perhaps overturning the net cost of the tax change to renters. Appendix H describes some attempts to investigate this tax-shifting question by econometric models of rent determination. At this point, we confess these models to be inconclusive, so we cannot in confidence give more than these direct effects.

**Figure 5-3.A: Renters' Total Tax Payments Under Scenario 2  
(Income Tax Only)**

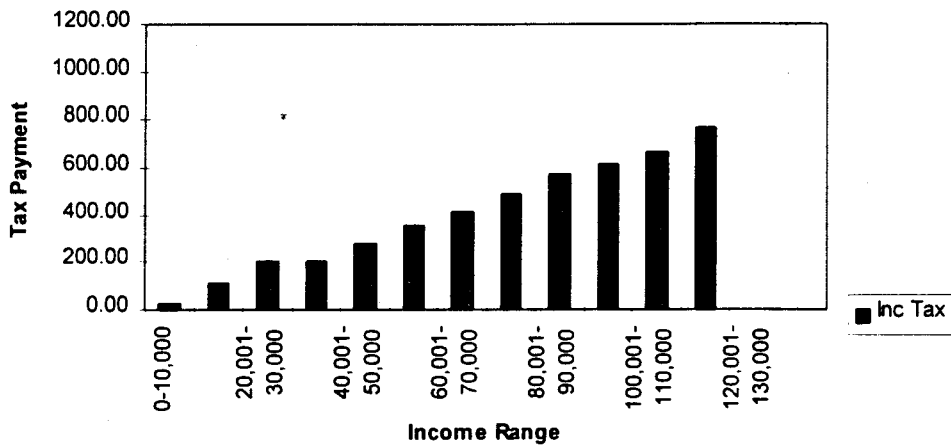
25th Percentile of Income: \$11,591

50th Percentile of Income: \$25,622

75th Percentile of Income: \$45,784



**Figure 5-3.B: Tax Payments of Renters,  
Incorporating State Credits and Federal Deductions**



## **Student Renters**

For the purposes of this analysis, students are defined as residents under age 35 who are currently enrolled in school, have more than a high school diploma, and rent or live in group quarters. Student owners and older students were excluded because their tax burdens will be different from those of the “typical” undergraduate or graduate student. We also have assumed that no students itemize deductions on the federal tax forms.

Under this definition, there are 28,126 students in Ann Arbor, comprising 43 percent of the renter population. The median personal income in 1995 was \$5,280. After deducting the \$600 personal exemption from this group’s total income, a total of \$2.555 million would have been paid in taxes to the city in 1995. This represents an average income tax payment of \$90 per student. Since we define students as renters and not owners, this income tax is not offset by property tax decreases. However, rents may decrease in the long run as a result of property tax shifting. Figure 5-4.A, which shows the distributional impacts of the income tax on students, bears out our expectation that students are not high wage earners. Seventy-five percent of the students will pay \$38 or less in taxes on average, and the differences are mitigated after considering the impact of the Michigan tax credit as shown by Figure 5-4.B.



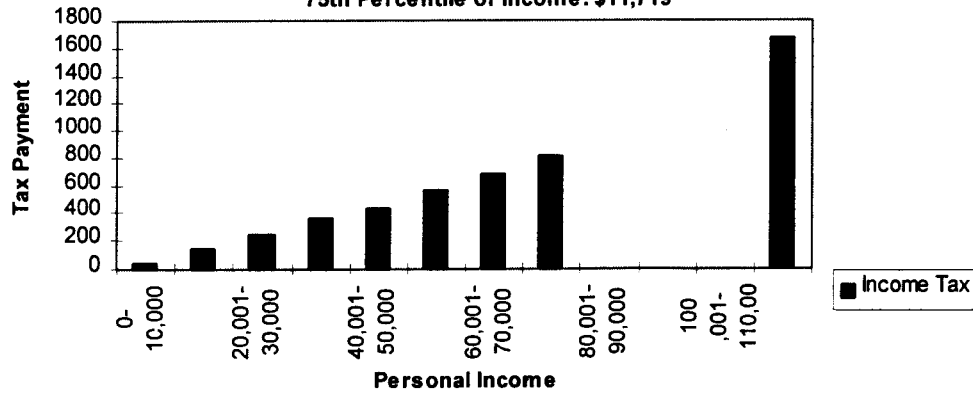
**Figure 5-4.A: Student Renters' Total Tax Payments Under**

**Scenario 2 (Income Tax Only)**

**25th Percentile of Income: 2,575**

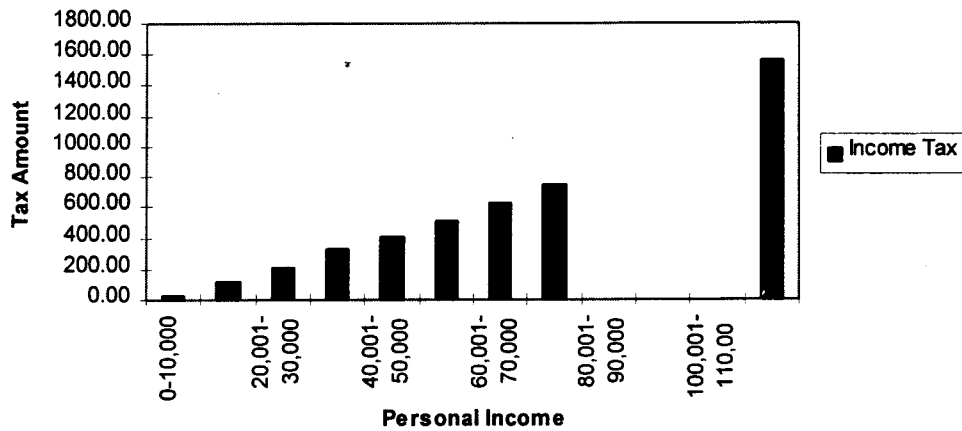
**50th Percentile of Income: 5,280**

**75th Percentile of Income: \$11,719**



**Figure 5-4.B: Student Renters' Total Tax Payments,**

**Incorporating State Income Tax Credit**

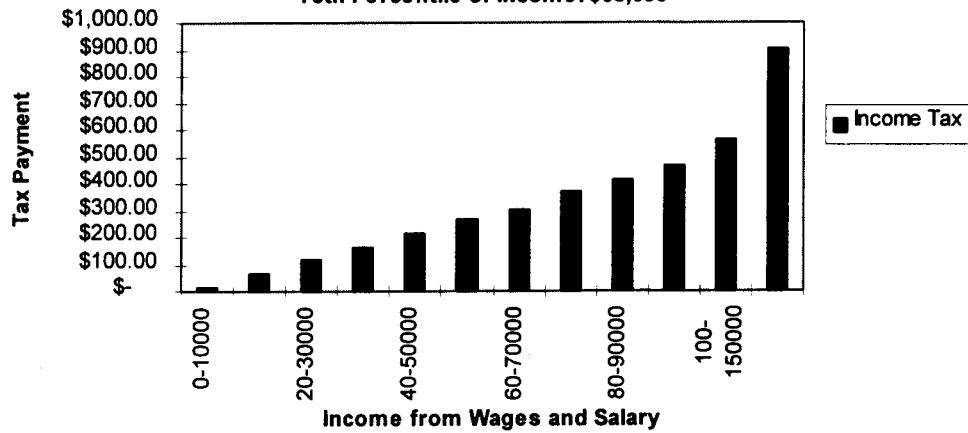


## **Incoming Commuters**

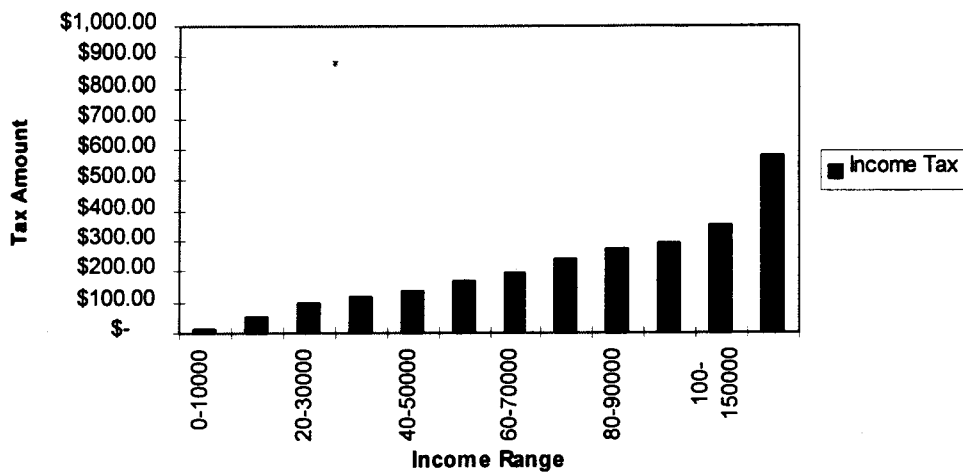
In 1995 we estimate that there are approximately 50,000 workers who commute into the city of Ann Arbor from surrounding towns, representing over one-half of the labor force in Ann Arbor. Incoming commuters have a median income of \$24,052, which is nearly the same as that of Ann Arbor residents, \$23,439. However, the large presence of students in Ann Arbor brings down the median income of the city. Looking at those in the uppermost income ranges, only 2.2 percent of commuters make over \$100,000 a year, while 4.7 percent of Ann Arbor residents fall into this upper bracket. Thus, commuters tend to earn somewhat less money than those who live in the city.

Incoming commuters will contribute approximately \$6.8 million to the city's revenues, representing 13 percent of total city tax revenues under Scenario 2 (in 1995 terms). The tax burden on commuters is predictably linear as the tax is "flat" at 0.5 percent. The median commuter, earning \$24,000, will pay approximately \$125 in taxes under the proposed tax system. Presumably, commuters are already paying property tax to their hometown, but such data are irrelevant to our analysis. Their current level of property taxation will be unaffected by the imposition of an income tax in Ann Arbor. This is simply an additional tax for commuters that will bring in close to \$7 million for the city. As before, the net cost to incoming commuters is less after taking account of the state income tax credit and the federal tax deduction. Figures 5-5.A and 5-5.B display these costs by personal income level.

**Figure 5-5.A: Commuters' Total Tax Payments Under  
Scenario 2 (Income Tax Only)**  
 25th Percentile of Income: \$12,878  
 50th Percentile of Income: \$24,052  
 75th Percentile of Income: \$38,636



**Figure 5-5.B: Commuters' Total Tax Payments, Incorporating  
State Income Tax Credit and Federal Deductions**



## Comparison to 1993 City of Ann Arbor Tax Feasibility Study

We have reviewed the Income Tax Feasibility Study conducted by the City of Ann Arbor in July of 1993 to compare findings regarding distributional impacts. Table 5-2 outlines the total property and income tax by group (owners, renters, commuters, business) indicating that a 1 percent income tax (Scenario 2) would result in an aggregate increase in tax payments for all groups except businesses. The 1993 study arrives at the same conclusion.

For owners, renters, commuters, and businesses, we were able to compare the aggregate tax incidence for each group. We use figures from the 1993 study, inflate them to 1995 dollars (by multiplying by the factor of 1.24711), and ignore the impact of all tax deductions and credits. We find the following comparable numbers:

**Table 5-2: Scenario 2's Total Income Taxes by Group -- Results of Two Studies**  
(in thousands of 1995 dollars)

Group:	Figures from this report	1993 Study Findings
Homeowners	\$26,810	\$20,056
Renters	\$6,941	\$7,899
Incoming Commuters	\$6,794	\$7,179
Businesses	\$13,271	\$12,079

Even after converting the figures from the 1993 study to 1995 dollars, we do find some discrepancies in the numbers. We believe these differences arise from several factors. In the case of owners, we suspect that our report's finding of a greater aggregate increase for the group is due in large part to the inclusion of senior and student households. The 1993 study did not include these households in its owner category, and based its average household income figure (\$71,150, or \$88,732 in 1995 terms) on non-student/non-senior households only. Those households totaled 11,518 in number. Therefore when we calculate an aggregate number from the information presented in the 1993 study, we arrive at a smaller figure.<sup>6</sup>

The renter figures are relatively close when comparing the two studies. Both studies also recognize that the property tax decrease theoretically should lead to eventual rent decreases, but cannot make any precise estimates.

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<sup>6</sup> This calculation involves taking the 1993 study's total new tax incidence figure for an owner household, \$1396.28, multiplying it by 1.24711 to inflate to 1995 dollars, and then multiplying by the number of households, 11,518, to arrive at the aggregate figure of \$20,056,000 shown in table.

The aggregate figures for commuters' tax incidence are similarly close. Our study based its figures on a commuter population of 52,070, derived from Census data. The 1993 study did not explain the source of its 25,166 commuter population figure. Nevertheless, the resulting tax incidence numbers are comparable. Both studies found that approximately 13 percent of the new total tax burden (under Scenario 2) would be shouldered by commuters.

Businesses are expected to experience an aggregate tax reduction according to Scenario 2 in both the 1993 City of Ann Arbor study and this one. We calculated an aggregate figure from the 1993 study by inflating the property and income tax figures to 1995 dollars.<sup>7</sup> The 1993 study generated its numbers from 7,382 businesses located within the city, and our study used data from the Economic Census.

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<sup>7</sup> Calculation = reduction in property taxes, \$4,923,734, multiplied by the inflation factor, divided by 6.45 mills, multiplied by 10.35 mills and added to the inflated income tax revenue figure of \$ 2,225,860.

## Chapter 6 Impacts Upon Businesses

This chapter examines how Ann Arbor's business community would be affected by the adoption of a local income tax as a substitute for the city's general operating millage. For all analyses in this chapter, a 1 percent income tax rate is assumed.

We calculated estimates of business tax revenue as follows:

- The U.S. Commerce Department's 1992 Economic Census was used to determine economic activity in Ann Arbor according to the seven sectors defined in the survey. These sectors are: Wholesale Trade, Retail Trade, Service, Manufacturers, FIRE (Financial, Investment, Real Estate), Construction, and Mineral.<sup>8</sup> The Economic Census is conducted every five years and includes data on the total number of establishments, revenue, employees, and payroll for all Ann Arbor businesses grouped by Standard Industrial Classification (SIC) codes.<sup>9</sup>
- To estimate profit and ultimately income taxes paid by business, Dunn and Bradstreet statistics of national Return on Sales (ROS) averaged for the years 1991, 1992, and 1993 were recorded by SIC code. The average ROS for the three years was then multiplied by the estimated revenue (from the Economic Census) to determine estimated profit per sector. The 1992 data were projected to 1995 and subsequently to years 1998-2006 utilizing the same assumptions and techniques used for the annual income growth of individuals (details are in Appendix E). We applied the corporate tax rate (same as resident rate) to the estimated profit by sector to project income tax revenues for each year.
- To estimate each sector's taxable base of assets and ultimately total property taxes paid by businesses, estimated 1995 profit was divided by each sector's average Return on Assets (ROA) for years 1991, 1992, and 1993. The 1995 data were projected to years 1998-2006 utilizing the same techniques described for the taxable property values of individuals (details are in Appendix D). The total asset estimate was compared to the actual taxable value of assets as determined by the City Assessor's office. For 1995, our estimate was approximately \$1.2 billion versus the actual value of \$1.1 billion. We adjusted our estimates by the percentage difference and then calculated each sector's property taxes at the respective millage levels for Scenarios 1 and 2.

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<sup>8</sup> Estimates for the Mineral sector in Ann Arbor were not calculated because the extent of activity in this sector is too small (1990 Census figures put the total number of people working in Ann Arbor in this sector at nineteen).

<sup>9</sup> Data for the FIRE and Construction sectors was not broken out beyond the Ann Arbor PMSA area. Therefore, to estimate the total revenue for these two sectors only, we multiplied the Ann Arbor PMSA area revenue data by a ratio of employees working in the City of Ann Arbor (from 1990 census data) over employees working in the Ann Arbor PMSA.

## General Impacts

Based on estimated net profits for 1998, the aggregate impact of Scenario 2's 1 percent income tax on Ann Arbor businesses is projected as a savings of approximately \$6.1 million (30 percent). This effect of savings is based on the relationship of taxable business income to taxable business property. When Scenario 2 tax rates are applied, revenue from businesses skews decidedly to property taxes -- a split of 87 percent property taxes and 13 percent income taxes -- unlike the approximately even split for the sum of individual taxpayers. For the average business, Scenario 2's 38 percent decrease in property taxes (16.8015 to 10.35 mills) does not begin to be offset by a 1 percent income tax.

As shown by Table 6-1, projections of the annual savings through year 2006 indicate a steady savings increase in current dollars; however, the percentage savings slows slightly -- to 27 percent at year 2006. This is because income is projected to grow at a higher annual rate than taxable property values for which appreciation is capped by the regulations of Proposal A. Thus, by year 2006, income taxes would grow to 16 percent of total tax revenues and tax savings would decline slightly.

Table 6-1: Business Property and Income Tax Revenue (Thousands of current dollars)		
	Scenario 1	Scenario 2
Base Year: 1998	20,679	14,579
% Gain vs. Scenario 1		-30
Future Year: 2006	25,334	18,497
% Gain vs. Scenario 1		-27
Nine Years: 1998-2006	206,438	148,148
% Gain vs. Scenario 1		-28

## Distributional Effects

To continue Chapter 5's analysis of the tax distribution effects for the year 1995, Table 6-2 displays 1995 tax revenue changes for Ann Arbor's six business sectors. The range of Scenario 2 savings for the six sectors is clustered fairly closely around the average of 30 percent -- from a low of 28 percent for the Service sector to a high of 34 percent for the FIRE sector. As with the aggregate business figures, the level of savings per sector is based on the relationship of taxable income to taxable property. In absolute dollars, the Service sector would realize the largest savings at approximately \$1.7 million, due to its large share of local economic activity.

Table 6-2: Total Business Property and Income Taxes (Thousands of 1995 dollars)			
	Scenario 1: 16.8015 Mill Property Tax	Scenario 2: 10.35 Mill Prop. Tax Plus 1% Income Tax	% Change
Subgroup			
Service	6,050	4,376	-28
Retail	4,872	3,390	-30
Wholesale	3,108	2,122	-32
FIRE	2,572	1,693	-34
Construction	1,288	895	-31
Manufacturers	1,134	795	-30
TOTAL	19,024	13,271	-30

### Possible Effects of an Income Tax on Ann Arbor Businesses<sup>10</sup>

Our projections assume that an income tax would not cause significant changes in Ann Arbor's business activity; however, there are two general ways in which it could affect activity. The first is a reaction to that aspect of the tax scheme which includes a tax on business. One would expect that businesses would react, within certain limits, to reduce their total tax payments as much as possible. Therefore, it may be that businesses could profit by changing their methods of production or their locations in response to these changes in tax levels and composition. The second potential effect is the possibility that the wage rate will have to increase in commensurate fashion with the income tax in order to compensate workers for the imposition of this new tax. While this change in the labor market could logically apply

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<sup>10</sup> The research team conducted a survey of local businesses to obtain information about the compensation levels of their employees. When asking businesses for this information, we also asked for general feedback about the proposed income tax. Some respondents chose this opportunity to express opinions about the proposed tax. Most were skeptical about the motivation to adopt the tax. Several respondents stated that they did not believe the sincerity of the city with respect to the drop in property tax millage to accompany the adoption of an income tax; they thought the city wanted to use the tax to expand its taxation powers, taxing an additional base rather than partially replacing one, the property tax, with a new one, the income tax. Some businesses appeared threatened by *any* proposal by the city, stating that the city must not care about its business community if it would seriously consider such a tax. Some thought that the city should make a greater effort to open a discourse with the business community on the issue. As far as we could tell, there seemed to be relatively little recognition that this tax shift would in reality be a tax cut for most Ann Arbor businesses.



to incoming commuters only, it would still increase Ann Arbor employers' cost of doing business.<sup>11</sup> The ultimate validity of such a concern, however, depends on the relative elasticities of labor supply and demand in the city. If it turns out that labor is more expensive as a result of this tax change then it would again be reasonable to expect businesses to react in a way that minimizes their tax burden.

### **Business Location Effects**

Though the tax shift would reduce the tax burden on Ann Arbor businesses as a whole, certainly some businesses could pay more—namely those with limited assets (who would save little from the drop in property taxes) and relatively high labor intensity. It stands to reason that businesses with high mobility would be tempted to relocate inside Ann Arbor if their tax burden fell and outside Ann Arbor if their tax burden rose. If a business has chosen to locate outside of Ann Arbor, that business might choose to relocate inside city limits if the income tax brought about lower overall tax liability. Indeed, because our projections indicate that businesses, in general, would save more through the elimination of the general operating millage than they would pay in income taxes, the main movement within the business community would, if anything, be a tendency to relocate in Ann Arbor.

And this tendency could be significant. Table 6-3 summarizes selected studies about the effects of taxation on business location.<sup>12</sup> Each study attempts to estimate the elasticity of business activity with respect to state and local taxation. Generally, this is the long-run percentage effect on local business activity of a 1 percent across-the-board increase in state and local taxation. In general, and not surprisingly, the studies find a negative relationship

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<sup>11</sup> The most important population at issue here is incoming commuters. Residents will be able to avoid the tax only by dropping out of the labor force or reducing their hours—by simply working outside the city they are still subject to the 1 percent rate—and this phenomenon in the context of marginal tax changes is historically rare and econometrically negligible. Consequently, the concerns of the Ann Arbor business community are overwhelmingly relegated to incoming commuters.

<sup>12</sup> Sources include:

Bartik, Timothy J. *Who Benefits from State and Local Economic Development Policies?*

Charney, Alberta H. 1983. "Intraurban Manufacturing Location Decisions and Local Tax Differentials." *Journal of Urban Economics* 14: 184-205.

Gyourkko, Joseph. 1987. "Effects of Local Tax Structures on the Factor Intensity Composition of Manufacturing Activities Across Cities." *Journal of Urban Economics* 22: 154-164.

Newman, Richard. 1983. "Industry Migration and Growth in the South." *Review of Economics and Statistics* 65: 76-86.

Schmenner, Roger W., Joel C. Huber, and Randall L. Cook. 1987. "Geographic Differences and the Location of New Manufacturing Plants." *Journal of Urban Economics* 21: 83-104.

Testa, William A. 1989. "Metro Area Growth from 1976 to 1985: Theory and Evidence." Working Paper, Federal Reserve Bank of Chicago, February.

Wasylenko, Michael. 1980. "Evidence of Fiscal Differential and Intrametropolitan Firm Relocation." *Land Economics* 56, 3 (August): 339-349.

Wasylenko, Michael and Therese McGuire. 1985. "Jobs and Taxes: The Effect of the Business Climate on State's Employment Growth Rates." *National Tax Journal* 38, 4 (December): 497-512.

between taxation and business activity. This conclusion, keeping in mind that the tax shift under discussion here would amount to a reduction in the average business tax burden, does predict a significant influx of businesses into Ann Arbor. Elasticities cited in the right hand column illustrate the movement of the business community in reaction to a tax increase, the kind and degree of which varies with the study. For example, the Wasylenko study of Milwaukee city businesses finds that for every 1 percent increase in the tax burden on business, 2.7 percent of existing businesses chose to leave the confines of Milwaukee for a location in the suburbs. This means that Wasylenko predicts that for every 1 percent *decrease* in the tax burden on businesses, the population of Milwaukee businesses would *increase* by 2.7 percent. Whether such effects would be felt in a more land-constrained Ann Arbor is, of course, an open question.

**Table 6-3: A Brief Compendium of Tax Effects on Business**

Study	Finding of Interest
Schmenner, Huber & Cook (1987)	New Branch Plants who say in a survey that they want low taxes are estimated to have significantly greater response to state and local taxes in making location decisions than other plants who do not state a desire for low taxes (-3.09 vs. -.50 elasticity).
Charney (1983)	Long-run elasticity of relocating manufacturing firms in Detroit MSA is -2.52
Wasylenko (1980)	Firms relocating from Milwaukee to suburbs exhibit high long-run elasticity (-2.70) to property taxes
Wasylenko & McGuire (1985)	Long-run elasticity with respect to taxes is -1.54 for manufacturing employment, -.85 for total employment.
Testa (1989)	Long-run elasticity for with respect to taxes is -.93 for manufacturing employees, -.02 for non manufacturing.
Gyourkko (1987)	High property taxes tend to increase labor intensity of an MSA's manufacturing base.
Newman (1983)	Negative effect of corporate tax on employment is greater for more capital-intensive industries.

Of note, to the degree this tax shift would encourage relocation to Ann Arbor, basic economic theory predicts a modest decrease in the prices of goods and services in the city. If, as discussed above, a decrease in the overall business tax burden brings about a lower cost of doing business in Ann Arbor as opposed to the surrounding communities, the influx of new businesses should bring both more competition to the city—resulting in marginally lower prices for consumers in Ann Arbor—as well as marginally higher commercial rents, brought about by increased demand. Quantifying these tertiary effects would require assumptions and generalizations to such a degree that any answers would be unusably inaccurate. Moreover, unlike the locational impacts, these effects are likely to be economically minute.

## **The Effect of Labor Market Changes Under an Income Tax**

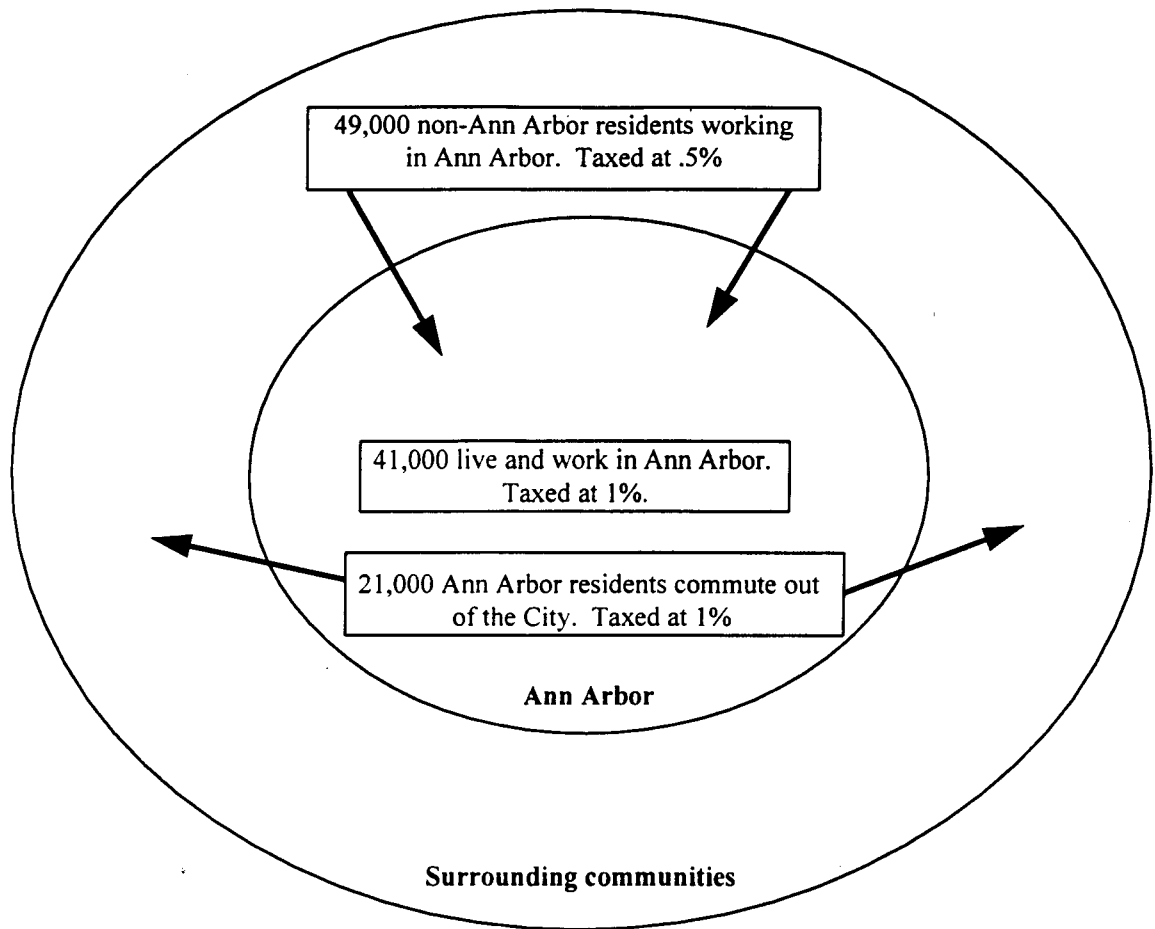
In general the burden of any tax will depend on whether and to what extent suppliers and demanders of the product in question have viable alternatives to that product. In the case of an income tax, of course, the product in question is labor living in the suburbs. If workers live in Ann Arbor, they will be taxed at the resident income tax rate wherever they work, and there should be no effect on wages. Moreover, if, say, microbiologists living in the suburbs have no option other than to work for the University of Michigan, their wages will not have to increase in compensation for the tax—for they have no other alternatives. If, on the other hand, accountants living in the suburbs can find perfectly acceptable work outside the city limits, their wages may well have to increase in order for Ann Arbor employers to retain their services. Consequently, the question of whether wage rates will rise to compensate for the tax depends on whether and to what extent commuters to Ann Arbor have viable alternatives open to them, such as not working in Ann Arbor or not working at all. This question is impossible to answer with a great degree of quantitative certainty. However, we can offer an overview of the economic theory that informs this question and relay some basic information regarding how these theories may play out in the context of Ann Arbor.

Several clues exist which may belie the relative elasticity of labor supply in Ann Arbor. One clue as to whether suppliers of labor have viable alternatives open to them is the minimum wage, and indeed the minimum wage is largely nonbinding in Ann Arbor. Because there are relatively few places where anyone actually receives no more than the minimum wage, employers in the city must have found that they were unable to attract an adequate supply of labor at that wage, and consequently have had to offer higher-than-minimum-wage rates to fill labor requirements. This would certainly suggest that suppliers of labor in Ann Arbor have a relatively wide array of options open to them.

Another clue, and also an explanation for Ann Arbor's minimum wage phenomenon, is that Ann Arbor is geographically proximate to many other centers of commerce. Cities like Ypsilanti and Saline, in addition to Detroit, offer many employment opportunities for people who live near Ann Arbor. The mere existence of this phenomenon can be verified by the high level of Ann Arbor commuting. As displayed by Figure 6-1, the 1990 Census indicated that approximately 21,000 people commuted out of Ann Arbor to their primary place of work while about 49,000 people commuted in. That is, a number that is more than half of the population of Ann Arbor commuted either into or out of the city to work. But as shown in the example above, it is hard to determine the impact of even this significant degree of commuting on Ann Arbor wages.

A third clue is the unusually large proportion of the population of Ann Arbor that is composed of students. Students are both relatively well off compared to similarly aged non-students and are often pure consumers, not participating in the labor market to the same degree as non-students. The 1990 Census, for example, showed that in Ann Arbor, 86.7 percent of non-students aged 18-25 work full time while conversely only 45.04 percent of students are employed. Consequently, employers in Ann Arbor must meet the demand for goods and services of a normal 100,000 person city, but they must do so with the labor supply

Figure 6-1: Ann Arbor Employment by Resident Status; 1990 Census



of a smaller town due to the number of people who have removed themselves from the labor market. When demand for labor is in excess of supply, the price of labor, or the wage rate, must be bid up.

These clues give superficial credence to the concerns of the Ann Arbor business community that employers will bear a burden of the income tax that is greater than the direct effects shown earlier. However, a survey of the econometric literature on the elasticity of the net (after-tax) wage on the number of hours worked (or, supply of labor in hours) yields a range of  $-.2$  to  $0$ .<sup>13</sup> Perhaps surprisingly, an elasticity of  $-.2$  predicts that for every 1 percent increase in the net wage, supply of labor will *decrease* by .2 percent. Conversely then, an 0.5 percent decrease in the net wage, which would be caused by the imposition of a 1 percent residential income tax, would yield a 0.1 percent *increase* in the number of hours worked. This result supports the primacy of the “income effect” of income taxes as opposed to the “substitution effect.”<sup>14</sup>

Because Ann Arbor employees apparently have a wide array of options open to them, it is incumbent upon us to consider the highest possible elasticity in our range. But, even if we assume a worst-case scenario for employers in Ann Arbor, the upper bound of this elasticity is simply zero. This means that even if Ann Arbor has a labor pool which is unusually responsive to changes in net wage, as it well might, there would at worst be no impact on the supply of labor. With labor supply stable in the presence of an income tax there would, at first pass, appear to be little cause for the concern that employers in Ann Arbor would be forced to “make-up” the income tax for their employees. Indeed, it is conceivable that the income tax would encourage an increase in the supply of labor, thus allowing the market-clearing wage rate actually to decrease for any given industrial sector. Moreover, as previously noted, it is important to recognize that different groups of workers will react to the tax with different elasticities. Even though the overall effect should be zero, it shouldn’t surprise us if a negligible number of unskilled or semiskilled workers who currently commute into Ann Arbor find other jobs outside the city. But this number should be very small, will probably have minimal impact on wages, and should be more than compensated for by an increase in the labor supply from other groups of workers.

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<sup>13</sup> Rosen, H.S. 1995. Public Finance Irwin, United States. 403-404

<sup>14</sup> Economists understand two conceivable results of a tax on labor income. The first, called the substitution effect, posits that when the net wage rate falls due to an income tax, the opportunity cost of leisure (that is, the amount of money one is implicitly spending by *not* working) goes down. Because leisure is considered a normal good (the more we can afford, the more we buy) this decrease in the cost of leisure will lead to an increase in its consumption. And an increase in leisure consumption is, obviously, a decrease in the supply of labor. Conversely, the income effect posits that when an individual is taxed, his or her income goes down. Because there is a cost to leisure, when one has less income one consumes less of all normal goods including leisure. This effect would predict that a decrease in the net wage would effectively increase the supply of labor as individuals are finding themselves unable to consume as much leisure as before. These conflicting effects can be most easily summarized by the two statements that follow. Indeed, we can imagine a reasonable person saying either:

- 1) “With these taxes, it’s really not worth it for me to work as much as I used to.”
- 2) “With these taxes, I have to work more to maintain my standard of living.”

## **Appendices**

- A. Taxable Income as Calculated within Other Cities' Income Tax Forms
- B. Additional Revenue and Cost Data for Other Cities with an Income Tax
- C. Estimating the Role of an Income Tax within Tax Revenue Per Capita for Michigan's Twenty-five Largest Cities
- D. Estimating Property Tax Revenues
- E. Estimating Income Tax Revenues
- F. Estimating the Distribution of Taxes
- G. Use of the City of Ann Arbor 1992 Household Survey
- H. Rent Model
- I. Impacts on University of Michigan Employees

**Taxable Income as Calculated within Other Cities'  
Income Tax Forms**

<b>RESIDENTS</b>
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**(A) FROM UNIFORM CITY INCOME TAX CODE:**

141.612 Excise tax on incomes; application to resident individuals

Sec. 12. The tax shall apply on the following types of income of a resident individual to the same extent and on the same basis that the income is subject to taxation under the federal internal revenue code.

- (a) On a salary, bonus, wage, commission and other compensation.
- (b) On a distributive share of the net profits of a resident owner of an unincorporated business, profession, enterprise, undertaking or other activity, as a result of work done, services rendered and other business activities wherever conducted.
- (c) On dividends, interest, capital gains less capital losses, income from estates and trusts and net profits from rentals of real and tangible personal property.
- (d) On other income of a resident individual.

**(B) IN PRACTICE (found in other cities' forms):**

**INCOME:** Total wages, salaries, commission, tips, sick pay, etc.  
 Interest (Fed sched B)  
 Dividends (Fed sched B)  
 Net Profit (loss) from Business or Profession (Fed sched C)  
 Sales & Exchanges of Property (Capital Gains & Losses;  
 for portion occurring after city income tax initiated; Fed sched D)  
 Rents & Royalties (Fed sched E)  
 Other Net Income (loss) from partnerships, estates, trusts, alimony,  
 lottery winnings, distributions from profit sharing, stock purchases, etc.

**DEDUCTIONS:**  
 Employee Business Expenses (Fed form 2106; not all allowed)  
 Moving Expenses -- into city only (Fed form 3903 & Sched A)  
 IRA Deduction  
 Self-employment retirement plan  
 Alimony paid  
 Interest on Obligations of U.S. or Subordinate Units

**INCOME NOT TAXABLE:**  
 Gifts, inheritances, bequests, and distributions of principal from estates/trusts  
 Pensions and annuities, including disability pensions  
 Proceeds of insurance that are defined as non-taxable by Fed. Internal Rev. Code  
 Amounts received for personal injuries, sickness, or disability, excluded only to  
 extent provided by Fed Internal Rev Code  
 Unemployment compensation, supplemental unemployment benefits, welfare relief  
 Worker's compensation, S.U.B. pay, welfare relief payment or similar payments  
 for death, injury or illness arising out of and in course of employee's job  
 Interest from obligations of the U.S., the states, or subordinate units of  
 governments of the states  
 Dividends on insurance policy  
 Military pay of members of armed forces of U.S.  
 Social Security Benefits

# NONRESIDENTS

## (A) FROM UNIFORM CITY INCOME TAX CODE:

### 141.613 Application of tax to nonresident individuals

Sec. 13. The tax shall apply on the following types of income of a nonresident individual to the same extent and on the same basis that the income is subject to taxation under the federal internal revenue code:

- (a) On a salary, bonus, wage, commission and other compensation for services rendered as an employee for work done or services performed in the city. ...
- (b) On a distributive share of the net profits of a nonresident owner of an unincorporated business, profession, enterprise, undertaking or other activity, as a result of work done, services rendered and other business activities conducted in the city.
- (c) On capital gains less capital losses, from sales of, and on the net profits from rentals of, real and tangible personal property, if the capital gains arise from property located in the city.

## (B) IN PRACTICE (found in other cities' forms):

### PERCENTAGE OF WAGES FROM CITY:

Determined by: Actual # days worked (total on-job less  
vacation, holiday, and sick days)  
Actual # days worked in city  
% of Total days worked that were in city

### INCOME:

#### MULTIPLIED BY % OF DAYS WORKED IN CITY:

Total wages, salaries, commission, tips, sick pay, etc.

Distributions of employee profit sharing plans, retirement stock purchases, etc.

#### CALCULATED BY BUSINESS ALLOCATION METHOD:

Net Profit (loss) from Business or Profession including Partnerships (Fed sched C;  
use business allocation method to determine amount in city)

#### CALCULATED AT 100%:

Sales & Exchanges of Property Located in City (Capital Gains & Losses;  
for portion occurring after city income tax initiated; Fed sched D)

Rental Income from Property Located in City (Fed sched E)

### DEDUCTIONS:

#### ALL MULTIPLIED BY % OF DAYS WORKED IN CITY:

Employee Business Expenses (Fed form 2106; not all allowed)

Moving Expenses -- into city only (Fed form 3903 & Sched A)

IRA Deduction

Self-employment retirement plan

Alimony paid

### INCOME NOT TAXABLE:

Same as for residents, but adding:

Interest, dividends and other forms of intangible income (when such income is  
part of a business, it shall be considered as business income taxable to  
nonresidents and reported on Schedule C).



**(A) FROM UNIFORM CITY INCOME TAX CODE:**

**141.614 Excise tax on incomes; taxable net profits of a corporation, definition**

Sec. 14. The tax shall apply on the taxable net profits of a corporation doing business in the city, being levied on such part of the taxable net profits as is earned by the corporation as a result of work done, services rendered and other business activities conducted in the city, as determined in accordance with this ordinance. "Taxable net profits of a corporation" means federal taxable income as defined in section 63 of the federal internal revenue code but taking into consideration all exclusions and adjustments provided in this ordinance. No deduction shall be allowed for:

- (a) Net operating losses and net capital losses sustained prior to the effective date of the tax.
- (b) The city income tax imposed by this ordinance.

**141.618 Part of business activity in city; apportionment of net profit**

Sec. 18 When the entire net profit of a business subject to the tax is not derived from business activities exclusively within the city, the portion of the entire net profit earned as a result of work done, services rendered or other business activity conducted in the city, shall be determined under either section 19, sections 20 to 24, or section 25.

Sec. 19 The taxpayer may petition for and the administrator may grant approval of ... the separate accounting method. ...

Sec. 20 The business allocation percentage method shall be used if such taxpayer is not granted approval to use the separate accounting method of allocation. The entire net profits of such taxpayer as a result of work done, services rendered, or other business activity conducted in the city shall be ascertained by determining the total "in-city" percentages of property, payroll, and sales. "In-city" percentages of property, payroll and sales, separately computed, shall be determined in accordance with sections 21 to 24.

Sec. 25 An alternative method of accounting shall be used if the taxpayer or the administrator demonstrates that the net profits of the taxpayer allocable to the city cannot be justly and equitably determined under the separate accounting method or the business allocation percentage method ...

**(B) IN PRACTICE (found in other cities' forms):**

**BUSINESS ALLOCATION PERCENTAGE METHOD:**

1. Calculate % located in city of:
  - Avg net book value of real and tangible personal property plus gross annual rentals of real property multiplied by 8.
  - Total wages, salaries, commission and other compensation of all employees.
  - Gross revenue from sales made or services rendered.
2. Calculate straight average of above percentages (excluding any zeroes).

**INCOME:**

Taxable income from Fed. Form 1120 or 1120S before net operating loss deduction and special deductions.  
 PLUS: Gain or loss from sale or exchange of property included above  
 PLUS: Items not deductible under city's income tax ordinance  
 LESS: Items not taxable under city's income tax ordinance

**TAX LIABILITY:**

Income (above) multiplied by allocation percentage  
 Less applicable portion of net operating loss carryover and/or capital loss carryover

## APPENDIX B

### Additional Revenue and Cost Data for Michigan Cities with an Income Tax

	CITY REVENUE (1995-96):			REVENUE PER RESIDENT:			1995-96 Total Income Tax Administration Cost	
	Grand Total (\$)	Income Tax (\$)	Income Tax % of Total	Total Revenue (\$)	Income Tax Revenue (\$)		Total \$	\$ Per Resident
<b>LARGE CITIES:</b>								
Detroit	1,258,000,000	337,000,000	27	1,224	328	--	--	--
Grand Rapids	84,260,000	32,330,000	38	446	171	1,000,000	1,000,000	5.29
Flint	78,000,000	26,260,000	34	554	187	800,000	800,000	5.68
Lansing	89,982,166	25,222,000	28	707	198	400,000	400,000	3.14
Pontiac	--	--	--	--	--	--	--	--
Saginaw	16,800,000	13,000,000	77	242	187	325,000	325,000	4.68
Battle Creek	35,000,000	12,500,000	36	654	233	380,000	380,000	7.10
<b>Weighted Average*</b>			<b>29</b>		<b>188</b>			
<b>OTHER CITIES:</b>								
Walker	8,792,000	5,200,000	59	509	301	192,400	192,400	11.13
Ionia	3,000,000	1,400,000	47	500	233	75,000	75,000	12.50
Lapeer	3,000,000	1,600,000	53	387	206	99,700	99,700	12.85
Hudson	4,000,000	432,000	11	1,550	167	15,000	15,000	5.81
Jackson	16,722,174	6,017,727	36	447	161	140,000	140,000	3.74
Muskegon	--	6,105,000	--	--	153	90,000	90,000	2.25
Port Huron	17,454,522	5,006,303	29	518	149	159,504	159,504	4.73
Portland	2,769,560	531,032	19	712	137	--	--	--
Grayling	--	265,532	--	--	137	26,000	26,000	13.37
Springfield	8,414,800	706,000	8	1,507	126	164,485	164,485	29.47
Big Rapids	4,000,000	1,400,000	35	317	111	48,000	48,000	3.81
Albion	3,900,000	1,100,000	28	387	109	--	--	--
Hamtramck	5,848,098	1,800,000	31	318	98	165,000	165,000	8.98
Highland Park	--	440,000	--	--	22			
<b>Weighted Average*</b>			<b>33</b>		<b>147</b>			

\* Averages are weighted according to population and include only cities for which data is available.

## APPENDIX C

### Estimating the Effect of an Income Tax on Tax Revenue Per Capita for Michigan's Twenty-five Largest Cities

This appendix describes statistical analysis conducted with data from Michigan's twenty-five largest cities. Our goal was to determine how a local income tax is associated with total tax revenue per capita.

Using multiple regression analysis, we created a model in which the dependent variable is 1990-91 total tax revenue per capita. We utilized a dummy variable for the presence of a local income tax and also included a vector of other independent variables associated with tax revenue per capita. With this model, the resulting coefficient of the dummy variable is the estimate of the average contribution of an income tax to total tax revenue per capita when other variables are held constant.

The regression equation shown below includes: 1990-91 total tax revenue per capita (R); the dummy variable described above (T); 1986 total property assessment per capita (P); 1990-91 millage levels (M); and 1989 median income (I). The Census was the source of all data except millage levels which were obtained from a report prepared by the State of Michigan entitled "The Ad Valorem Property Tax Levy Report." Three cities (Rochester Hills, East Lansing, and Portage) were not included due to missing property value data.

$$R = \phi + \alpha T + \beta P + \lambda M + \rho I$$

Coefficient estimates are shown in Table C-1. As discussed within the report, the estimated coefficient for the dummy variable indicates that having an income tax was associated with an average \$156 greater 1990-91 tax revenue per capita among Michigan's twenty-five largest cities when other key variables are held constant. The coefficients for property assessment and income indicate insubstantial effect upon tax revenue per capita when other variables are held constant, and the coefficient for millage indicates that an additional mill is associated with \$12.80 greater revenue per capita with all else equal. The overall equation generated an  $R^2$  of .744. We also ran an alternate regression equation in which the median income variable was dropped. The result was consistent -- it estimated \$155 as the coefficient for the dummy variable.

TABLE C-1 Coefficient Estimates			
		Coefficient Estimates	T-Ratios
Dummy (Income Tax)	$\alpha$	155.9591	3.363
Property Value Per Capita	$\beta$	0.0202	4.371
Millage Level	$\lambda$	12.8056	4.415
Median Income	$\rho$	0.0001	0.039

## APPENDIX D

### Estimating Property Tax Revenues

This appendix provides a detailed description of the methodology used to develop projections of property tax revenue for the city of Ann Arbor through the year 2006. Projections were not made past 2006 because of likely changes in the annexations law affecting property tax forecasts for that year. Since property tax revenue in a given year is the result of multiplying the current assessed value of property by the current millage rate, we describe: (1) the assessment system and our methodology for projecting assessments by year; and (2) the taxation system, including the changes that would be required if Ann Arbor were to enact a local income tax, and our projections of annual property tax revenue.

#### Property Assessment

Prior to the passage of Proposal A in March 1994, assessment was based upon a property's state equalized value (SEV), calculated at 50% of market value. Proposal A changed the property assessment system with regard to taxation by requiring the computation of a taxable value (TV) for every property, to serve as a new base for calculating taxes. The important difference between the TV and the SEV is the manner in which they can increase over time. Whereas the SEV can increase at uncapped rates, the increase in nominal TV is capped at 5 percent or the inflation rate, whichever is lower. The inflation rate is defined as the increase in the Consumer Price Index (CPI). Initial TV assessments were created in December 1994 based on the preceding year's SEV assessments.

Determining Ann Arbor's aggregate TV for a given year begins with the preceding year's combined residential and commercial TV. To this base, assessment *additions* are added. Additions are defined as increases in value caused by new construction, annexations, and the value of property previously exempt from taxes or not included in the previous assessment. In our calculations, total additions for combined residential and commercial property for each year are projected to equal 1 percent of the previous year's total TV since historic data reveals that 1 percent is an approximate combined predictor. We divide total additions by the split of 57 percent residential and 43 percent commercial, since this has been the approximate historic composition.

Following additions, *adjustments* are made to the preceding year's aggregate TV. Adjustments are defined as appreciation in property value. Though Proposal A limits annual TV appreciation to the CPI (at approximately 2.8 percent as forecasted by the GDP price deflator of the Congressional Budget Office), the total adjustment rate is not expected to equal the CPI because some properties will not experience an increase in TV. Residential property adjustments are predicted to equal 2 percent of the previous year's residential TV for each year through 2006. Commercial property adjustments are

predicted as slightly lower, equal to 1 percent of the previous year's commercial TV for each year through 2006, in light of sluggish commercial growth during the past five years.

The current year total TV is equal to the sum of the previous year's total TV and total additions. The portion of the total TV attributable to new construction within the geographic area of the Downtown Development Authority (DDA) is subtracted from the total TV to yield the "city's TV." This is because the tax revenues based on the DDA TV are diverted to the DDA and are not retained by the city.

## **Property Tax Revenues**

Ann Arbor's millage rates are determined each year by a vote of the City Council. The total millage for a given year consists of separate millage rates earmarked for different budget items including: general operating fund, employee benefits, refuse collection, transportation, debts, streets, and parks. For the fiscal year 1996-97, the separate rates total 16.8015 mills, including the general operating millage of 6.4515.

As described in this report, the city charter calls for eliminating the general operating millage if a city income tax is enacted. In effect, the income tax would substitute for this specific millage. In our Scenario 2 and 3 calculations, we assumed this policy switch would begin in 1998 and that 1996-97 millage rates would apply through the year 2006. Thus, in scenarios where Ann Arbor does enact an income tax, total property taxes are assumed to equal 10.35 mills (16.8015 less 6.4515) until year 2006. In scenarios where the city does not enact an income tax, total property taxes are assumed to remain at 16.8015 mills until year 2006. We calculated total property tax revenue for each year by applying total millage rates to the total city TV.

## **APPENDIX E**

### **Estimating Income Tax Revenues**

This appendix describes the methodology used to develop projections of income tax revenue for the city of Ann Arbor through the year 2006. Estimates were generated for city residents, incoming commuters, and businesses.

#### **Residents and Incoming Commuters Through Year 1995**

Data for estimating city resident income through the year 1995 came from the three sources described below. Data for estimating incoming commuter income was based on two of these sources.

##### Census: 1989 Data

Income data for both residents and incoming commuters were obtained from the 5% Public Use Microdata Systems (PUMS) of the 1990 Census (in which 1989 data are reported). The 5% PUMS is a sample of 5 percent of the American population which is given a longer form of the 1990 Census. This form requests person-level data for each household member, asking items such as income, educational attainment, age, work status, and commuting behavior. The data are then weighted up to reflect the entire population. This is considered to be the best estimate obtainable of the American population for the survey's range of data items.

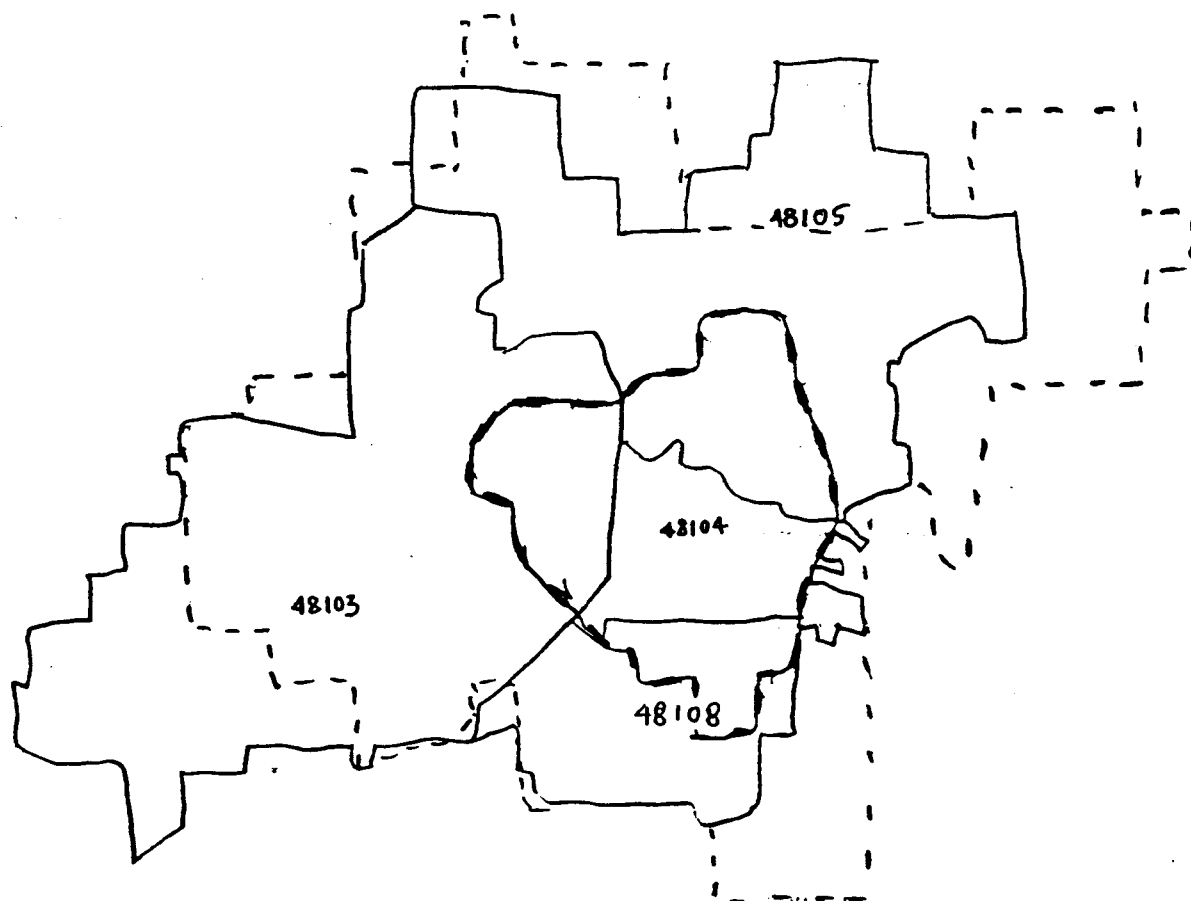
For the purposes of this study, the city of Ann Arbor was selected from the national database (the Census geographic lines are aligned with the city lines). Since the proposed income tax would be levied on all residents of Ann Arbor, regardless of where they work, tables were run for all residents of the city who have income. Additionally, since Ann Arbor's income tax also would be levied on those who work in Ann Arbor but reside elsewhere (at one-half the resident rate), we utilized the database to generate income data for these incoming commuters.

Since the Census data referred to 1989 income, we utilized a second source of data as a proxy for growth from 1989 to 1994. This source, described below, was income data associated with the Ann Arbor School District.

##### Ann Arbor School District: 1984-1994 Data

Income data for all residents within the Ann Arbor school district lines were obtained from the State of Michigan Department of Treasury for the eleven years ending in 1994. This geographical division is larger than the city lines, as is displayed in Figure E-1, and thus includes income that exceeds that of city residents. We estimate that total school district income is approximately 15 percent greater; however, we utilized its approximation of Ann Arbor resident income as a means of bringing the 1989 Census data up to 1995. This was done in two stages: First, the eleven years of school district

Figure E-1



----- School District  
—— Zip Codes  
----- City Limits

data (1984-1994) were utilized to generate an estimate of Ann Arbor income *trend growth* in real terms plus an estimate of the city's *cyclical response* to changes in annual unemployment levels. This regression analysis is described fully below. The resulting trend growth and cyclical factors were utilized in combination with a CPI inflation factor to project 1994 school district income to 1995. Second, the overall nominal growth in school district data from 1989 to our projection for 1995 (+28.8 percent) was applied to the 1989 Census data (for residents within the Ann Arbor city lines plus incoming commuters) to project 1995 income.

#### Ann Arbor State Income Taxes: 1995 Data

State income tax return data were utilized to compare 1995 Ann Arbor resident *reported* income with our separate estimate of 1995 income described above. The Tax Analysis Division of Treasury was able to gather data from 1995 state income tax returns filed in the eight zip codes that encompass the city of Ann Arbor. Four of those zip codes are only partially in the city (48103, 48104, 48105, 48108). The data from these four zip codes were sent to the Department of Management and Budget's (DMB) Michigan Information Center. There the tax returns were run through a street address database to determine whether or not they fell within the city of Ann Arbor. About 75 percent of the addresses could be determined to fall in or out of the city limits. The other 25 percent could not be determined. Typically the match could not be made because of a mistyped address on the part of the State. Therefore, we assumed that the addresses that could not be matched were random, meaning that the 25 percent we did not know had the same characteristics as the 75 percent we did know (i.e., they have the same income distribution, and they fall in and out of the city in the same portions). By multiplying the data by the following weight we were able to estimate precisely the amount of taxable income for each of the four partial zip codes that fall within the city of Ann Arbor.

WEIGHT = % of matches in Ann Arbor of those matched for the entire zip code

By aggregating the weighted partial zip codes with the zip codes that fall entirely in the city we have a very precise estimate of 1995 income data for the city of Ann Arbor. In addition to overall city income, the Treasury was also able to identify the 1995 Michigan Income Tax data for homeowners in the city. The Treasury has a list of residents who filed homestead exemption affidavits for a home in the City of Ann Arbor. This list should include nearly all Ann Arbor homeowners who have claimed a homestead exemption. This exemption is nearly always claimed and is unrelated to the income tax homestead property tax credit which is often underclaimed. Social Security numbers were taken from this list and were run against the income data from the eight Ann Arbor zip codes to determine a very precise estimate of the income distribution of homeowners in the city.

State income tax data for 1995 had to be translated into estimates of city taxable income. First, federal adjusted gross income (AGI) was taken as the basis of taxable income. Then Michigan tax return additions were added. These additions represent other state taxable income such as capital gains, interest income, and dividend income. Also



Michigan tax return subtractions were excluded. These subtractions represent state income that is not taxable such as income from U.S. government obligations, military pay, income attributable to another state, and certain types of retirement benefits. The subtractions and additions are adjustments for *state* taxable income; however, they provide a very close estimate of adjustments that would need to be made to determine city taxable income.

### Results

The series of income estimates derived from the three sources described above are displayed in Table E-1. The 1995 estimate associated with Michigan Income Tax Data is equal to only 81.5 percent of the 1995 estimate generated by projecting forward the 1989 Census data. We associate this difference with underreporting of income within tax returns. Generally, the Census data represent what individuals think they made in income during the preceding year, which would be taxable if reported. The state income tax data represent the taxable income that was in fact reported; this is the only income the city can tax. The 81.5 percent level of reporting agrees with national averages and we therefore project it to hold in the future. Thus, our projection of 1995 income for Ann Arbor *city residents* is based on the \$1,965 million estimate derived from state income tax data. We believe this estimate is conservative since a local income tax would require payroll withholding for the majority of city residents -- those working in Ann Arbor -- and thus may generate increased levels of reporting.

For *incoming commuters*, we assume that full reporting will occur since all Ann Arbor employers would be required to process and report payroll withholding of the income tax. Our \$1,454 million estimate of 1995 income for incoming commuters is based on 1989 Census data projected to 1995 based on trends observed in Ann Arbor School District income data. One-half of incoming commuter income is included within total taxable income for the city of Ann Arbor as a means of generating one base to which the resident rate can be applied.

TABLE E-1: Income Estimates for Individuals (Millions of Current Dollars)

	1989	1990	1991	1992	1993	1994	1995
DATA SOURCES:							
School District	1,748	1,859	1,939	1,805	1,802	2,045	
MI Tax -- City Residents							1,965
Census -- City Residents	1,873						
Census -- Nonresidents	1,129						
FINAL ESTIMATES:							
City Residents							1,965
Nonresidents at 50%							727
Total Taxable Income							2,692

## Estimating Income for 1996-2006

As mentioned above, we performed regression analysis utilizing eleven years of Ann Arbor School District income data (1984-1994) in order to generate income estimates for the years 1996-2006. Estimated growth factors were applied to the 1995 income projections:

### The original model:

In order to estimate the Ann Arbor income we outlined an exponential model relating Ann Arbor income to the independent variables of national income, unemployment, and time. The functional form of this model is:

$$Y = ke^{\alpha t} GDP^{\beta} \left( \frac{U}{\bar{U}} \right)^{\gamma} \quad (1.1)$$

### The variables:

In equation (1.1),  $Y$  denotes Ann Arbor real income,  $GDP$  is national real output, and  $U$  national unemployment rate.  $\bar{U}$  represents the estimated natural rate of unemployment. The coefficients ( $\alpha$ ,  $\beta$ , and  $\gamma$ ) correspond to the respective population parameters. All nominal variables were converted to real terms using the GDP implicit price deflator.

### The log-linear model and alternative models:

The model was transformed by taking the natural logarithm on both sides of equation (1.1) so that we were able to use linear point-estimation methods.

$$\ln Y = \ln k + \alpha t + \beta \ln GDP + \gamma \ln \left( \frac{U}{\bar{U}} \right) \quad (1.2)$$

The coefficient  $\alpha$ , which is the partial derivative of  $\ln Y$  with respect to  $t$ , is the trend rate of growth of overall Ann Arbor income. The  $\beta$  represents the relationship between Ann Arbor income and the real national income. The coefficient  $\gamma$  captures the impact of cyclical unemployment on Ann Arbor income.

Although we started with this original model, we also examined two alternative models. The first excludes the national income term,  $GDP$ . The second, excludes the unemployment term,  $\left( \frac{U}{\bar{U}} \right)$ .

The alternative models are:

$$\ln Y = \ln k + \alpha t + \gamma \ln \left( \frac{U}{\bar{U}} \right) \quad (1.3)$$

$$\ln Y = \ln k + \alpha t + \beta \ln \text{GDP} \quad (1.4)$$

### Collinearity:

With our original model (1.2), none of the estimated slope coefficients were statistically significant at the 0.05 significance level. Our estimates for the  $\alpha$  and  $\beta$  ran counter to expectations in that our model produced negative coefficients where we expected positive ones. It is not surprising that we experienced multicollinearity in our data, considering that we had only eleven observations for Ann Arbor personal income within a period of fairly steady growth.

We still obtained unexpected and insignificant estimates after regressing the log of Ann Arbor (real) income on time and real national income (1.4). However, the regression of equation (1.3) had a good fit as well as highly significant coefficients with the expected signs. Therefore, we opted for the later regression and discarded the others.

### Autocorrelation:

Using the Durbin-Watson test statistic and plotting the residuals revealed positive autocorrelation in all of the previous models. For the regression using the equation (1.3) model, the DW was 1.0413 and the p-value 0.0024 ( $H_0: \rho=0$ ).

The autocorrelation problem was corrected by running a Feasible Generalized Least Squares (FGLS) regression of equation (1.3). The estimate of the first-order autocorrelation coefficient,  $\hat{\rho}$ , was 0.4.

### Estimation results:

$$\ln Y = 21.09 + 0.0304 t - 0.461 \ln \left( \frac{U}{\bar{U}} \right)$$

$$t \text{ ratios:} \quad (251.572) \quad (3.856) \quad (-3.158)$$

$$R^2 = 0.9380$$

$$n = 13$$

This means that the trend rate of real growth of Ann Arbor income is 3.04 percent per year, while the cyclical elasticity is 0.46. We describe the implications of this cyclical elasticity below.

## Income Projection Results:

TABLE E-2: Estimates of Coefficients

	Estimates	T-ratios
Trend Rate of Growth	$\alpha = .0303639$	$t=3.158$
Cyclical Factor	$\gamma = -.4609491$	$t=-3.8757$
$\ln Y = \ln k + \alpha t + \gamma \ln \left( \frac{U}{U} \right)$		

Using our estimates of the trend growth rate and the cyclical factor, listed in Table E-2, we were able to project resident and incoming commuter income for the years 1996-2006 by extrapolating from our estimates of 1995 income. Simply, we applied: (1) the trend growth rate, estimating the growth in Ann Arbor income to be 3.04

percent every year in real terms; (2) the -.46 cyclical factor associated with assumptions of unemployment as a portion of a constant 5.5 percent natural unemployment level; and (3) an annual CPI inflation factor of 2.8 percent as projected by the Congressional Budget Office. We applied this process to *business* income as well. As described in Chapter 6 of the report, 1992 business income data were obtained from the Economic Census. We then projected business income for years 1993-2006 utilizing the factors above.

We utilized this model for both Scenarios 2 and 3, as described in the report. It is the unemployment variable that simulates an economic downturn and thus the difference in income projections. First, for Scenario 2, we assumed the economy would perform as it has in the recent past and that the current 5.6 percent level of unemployment would be maintained in all years through 2006. Then, for Scenario 3, we simulated the contractionary effects of an economic slowdown by assuming higher unemployment in future years as listed within Table E-3. In contrast to a steady national unemployment rate of 5.6 percent under Scenario 2, the national unemployment rate for Scenario 3 is estimated to grow to 7.6 percent by the year 2002 and remain at this level for the last five of the nine years. We intentionally assumed a deep and lasting recession to see how the cyclical loss in revenues would affect the Ann Arbor city budget.

TABLE E-3  
Unemployment Rates (%) Assumed

	Scenario 2	Scenario 3
1998	5.6	6.0
1999	5.6	6.4
2000	5.6	6.8
2001	5.6	7.2
2002	5.6	7.6
2003	5.6	7.6
2004	5.6	7.6
2005	5.6	7.6
2006	5.6	7.6

## Estimating Population

Population estimates are required for calculating the number of personal exemptions per year, to be subtracted from taxable income at a given exemption amount.

### The model:

A time series model for population estimates was developed relating the Ann Arbor population with the national population and time. The functional form is an exponential model:

$$P = ke^{\alpha t} P_N^\beta \quad (2.1)$$

In this model,  $P$  represents the Ann Arbor population;  $P_N$  national population; and  $t$  the time trend variable.

### The log-linear model and alternative models:

We transformed the equation (2.1) by taking the logarithm of both sides of the equation:

$$\ln P = \ln k + \alpha t + \beta \ln P_N \quad (2.2)$$

Based on this model, we developed two alternative models excluding the  $\ln P_N$  term in the first and the time trend term in the second:

$$\ln P = \ln k + \alpha t \quad (2.3)$$

$$\ln P = \ln k + \beta \ln P_N \quad (2.4)$$

### Collinearity:

Estimation of (2.2) gives us unexpected estimates of the slope coefficients, in particular of  $\beta$ . Again, we experienced multicollinearity with our data. Alternative estimations of models (2.3) and (2.4) were done.

### Autocorrelation:

Using the Durbin-Watson test statistic and residuals plotting revealed serious positive autocorrelation problems in all the population models. For our regression equation (2.3) the DW was 0.1225. For equation (2.4) the DW was 0.1313. The p-value for both equations was 0.001 ( $H_0: \rho=0$ ).

As with the income estimations, we fixed this autocorrelation problem by running a FGLS regression for the population model of equations (2.3) and (2.4). In this case, our estimates for the first-order autocorrelation coefficient,  $\hat{\rho}$ , were 0.815 and 0.83, respectively.

Estimation results:

$$\ln P = 11.191 + 0.011 t \quad (2.3^*)$$

t ratios: (133.34) (4.899)

$R^2 = 0.9784$

n = 23

$$\ln P = -10.1961 + 1.125 \ln P_N \quad (2.4^*)$$

t ratios: (-2.752) (5.829)

$R^2 = 0.9817$

n = 23

Equation (2.3<sup>\*</sup>) shows that the estimated Ann Arbor population growth rate over the studied period was approximately 1.1 percent. Equation (2.4<sup>\*</sup>) shows that Ann Arbor population rose at a slightly higher rate than the national population over the sample period. We projected population figures and thus exemption counts by applying this 1.1 percent growth estimate to 1990 Census figures for three populations: (1) total Ann Arbor residents; (2) incoming Ann Arbor commuters; and (3) Ann Arbor residents age 65+ who are entitled to an additional personal exemption.

## APPENDIX F

### Estimating the Distribution of Taxes

This appendix describes the methodology used in estimating how different population segments would be affected if an Ann Arbor income tax were to be enacted. Population segments include: homeowners; renters, incoming commuters; seniors; and students.

The 5% PUMS sample of the 1990 Census was the primary source of data utilized for these estimates. In addition to income and other person-level data, the PUMS sample provides data on household characteristics such as property value, monthly rent, utility costs, and mortgage payments. Various subgroup data on income and property values were tabulated, and distributional impacts were determined by looking at small increments of income (in \$1000 or \$2000 ranges) for each subgroup of interest.

We verified the reliability of Census data for property assessments by comparing it with actual aggregate data obtained from the city of Ann Arbor Assessor's Office. As shown in Table F-1, when the Census data is projected to 1995 terms, it is within 4 percent of the actual city data.

TABLE F-1: Aggregate Ann Arbor TV	
	1995 (\$)
SOURCE:	
1990 Census	42,080,000
Actual City Data	43,732,061
Difference	3.9%

The methods for bringing the 1990 Census data up to 1995 dollars are described following a list of defined Census terms:

#### Definition of Terms from Census Data Estimates

Commuters: Place of work is Ann Arbor but place of residence is not Ann Arbor. Includes those living in Michigan (but outside Ann Arbor) and those living out of state.

Residents: Place of residence is Ann Arbor, regardless of place of work.

Seniors: Ann Arbor residents aged 65 or over.

<u>Owners:</u>	Ann Arbor residents who own their homes with a mortgage or loan or who own their homes free and clear. Household income was used to estimate tax changes for owners, since property values are assessed at the household level.
<u>Renters:</u>	Ann Arbor residents who rent for cash, have no cash rent, or live in group quarters.
<u>Students:</u>	Ann Arbor residents under age 35 who are currently enrolled in school, who have more than a high school diploma, and who rent or live in group quarters. Student owners and older students were excluded from this category because their tax burdens will be different from those of the “typical” undergraduate or graduate student. Since the number of students does not grow as the population does, the population growth rate was not applied to the student population.
<u>Personal Income:</u>	Income measure utilized for Students and Commuters. Represents total person’s income minus non-taxable income (social security income and public assistance income). For Students, income includes wages or salary income plus all other types: non-farm self-employment, farm self-employment, interest, dividends, net rental, retirement, and all other. For Commuters, income includes only wages or salary. Income was reported in 1989 dollars and inflated to 1995 dollars.
<u>Household Income:</u>	Income measure utilized for all subgroups other than Students and Commuters. Represents total household income for 1989. Does not exclude nontaxable forms of income. Inflated to 1995 dollars using projection figures.
<u>Income Tax:</u>	Computed using the formula $(Y-600F)t$ , where Y = Taxable income in 1995 dollars, F = average household size, 600 = expected exemption level, t = expected tax rate (.01 for Ann Arbor residents, .005 for commuters).
<u>Property Tax:</u>	Computed using the formula $(PV/2)*.0064515$ , where PV = 1989 reported property value in Census data brought up to 1995 dollars, PV/2 = State Equalized Value (SEV), and .0064515 = millage that would be dropped under income tax plan. Of note, 1989 Census property values allowed us to calculate SEV by taking one-half of property values. As described below, however, we converted SEV to TV in the course of projecting values to 1995.



## Methods for Bringing Census Data up to 1995 Dollars

- Population:** Using the projections estimates that the population of Ann Arbor has been growing at approximately 1.1 percent per year, 1990 Census population estimates were multiplied by  $(1.011)^5 = 1.0562$ .
- Income:** Income projection estimates were available for the Ann Arbor School District, which as mentioned is larger than the political boundaries of the city but which serves as a close approximation of Ann Arbor income growth. Between 1989 and 1995, nominal income for the school district grew at a rate of 28.789 percent. This same growth rate was applied to the Census data, multiplying 1989 income data by 1.287892654.
- Property Value:** To bring 1990 property values up to 1995 estimates, average changes in actual residential taxable value estimates were used where available. These figures were available from the city of Ann Arbor for 1993-1995. To move back to 1990, an additions rate of 1 percentage point per year was added to CPI figures. Thus, from 1990 to 1991, residential assessed value increased by  $(4.2+1.0)=5.2$  percent. From 1991 to 1992, it increased by 4.0 percent, and from 1992 to 1993 it increased by 4.0 percent. Increases from 1993 to 1994 and from 1994 to 1995, based on actual city averages, were 6.0 percent and 2.5 percent respectively. Note that the increase to 1995 was the first year in which TV was utilized instead of SEV. Thus, the overall increase in property values from 1990 to 1995 was  $(1.052)(1.04)(1.04)(1.06)(1.025) = 1.236$ .

## **APPENDIX G**

### **Use of the City of Ann Arbor 1992 Household Survey**

The Income Tax Feasibility Study prepared by the City of Ann Arbor in 1993 derived much of its demographic information about the residents of Ann Arbor from data collected as part of the city's 1992 Household Survey (conducted by the Information Services Department of the City of Ann Arbor.) Although the survey provides useful information for estimating the impact of a local income tax on particular resident groups -- specifically owners, renters, seniors, and students -- the additional data sources consulted for this report significantly enhance the picture. Therefore, the data from the 1992 Household Survey have been examined primarily for the purpose of reviewing past analyses of the feasibility of an Ann Arbor income tax, and seeing how and where our present estimates diverge.

The 1993 City of Ann Arbor Income Tax Feasibility Study used the 1992 Household Survey as a primary source of data to calculate the annual average change in tax payments for owner, renter, senior, and student households. That study found that the average homeowner would see a reduction in taxes, while the average renter and nonresident would see an increase. Our study used the household survey data to confirm the demographic findings, but for reasons discussed below found the household data insufficient for determining changes in tax payments.

For the most part, our results regarding household demographics concurred with those described in the 1993 report. We did however, rerun the data and account for nonrespondents in the survey sample (decreasing the true sample size from 3607 to 2913), which changed the percentage of total Ann Arbor households sampled from 8.2 percent to 6.6 percent. The 1993 report had treated the group of nonrespondents as part of the usable sample. Therefore we recalculated the household breakdowns according to whether they were owned or rented, and housed by seniors or students. These figures are included in the tables to follow.

In terms of identifying household characteristics of Ann Arbor residents, the 1992 Household Survey provides a solid foundation. But there are limitations to the household survey data in terms of using it for an analysis of income tax feasibility. The household survey data lack three important components that are key to addressing the "income tax versus property tax" issue:

#### **Property tax figures**

The household survey does not include questions regarding property tax payments or value of home. The survey does inquire as to whether an owner's monthly payment includes property tax, but there is no means of determining what the amount of that payment is.

### Nonresident information

The Ann Arbor household survey is a survey of Ann Arbor residents. For the purpose of examining the income tax feasibility, information is also needed regarding nonresidents of Ann Arbor who either work in Ann Arbor and/or derive other income from Ann Arbor. With a shift to the income tax these nonresidents would begin to pay an Ann Arbor income tax (at one-half the resident rate) on their “Ann Arbor generated” income. Data on these individuals obviously are not available from the household survey, but are key to the income tax study.

### Individual-level data

Due to the nature of the survey, it acquires household level data. This limits the ability to analyze the effect of a tax change on individuals (looking at income, age, residency, student status, owner/renter status, etc.) The use of state tax records and Census data allows our study to identify the impact of a tax shift at an individual level.

This report, in an effort to avoid some of the holes created by relying heavily on household data such as that provided by the 1992 Household Survey, arrives at findings using actual income data and estimated property tax information drawn from Census data. In addition to utilizing a greater amount of data on which to base tax impact findings, we also avoided making several assumptions regarding students, residency, and seniors made in the 1993 study.

First, we do not assume that students are nonresidents. For the purpose of looking at income taxes, students working in Ann Arbor, regardless of their official state residency status, will be expected to pay 1 percent on their Ann Arbor income. We assume it unlikely that a student working a job in Ann Arbor would list an address other than his/her Ann Arbor address on the W-2 form. Presumably, checks are sent to Ann Arbor addresses. This assumption does not correspond to the 1993 study which treated all student income as taxable at only one-half the resident rate.

Another group that the 1993 study treats differently than does our report is the senior group. In terms of definition, the 1993 study refers to individuals over 60 years as “seniors.” Our report, which does not depend on the 1992 Household Survey question (asking to list number of adults over 60 in household), uses the more standard 65 and over as a definition of senior status.

More importantly we question the assumption made in the 1993 report that senior households can be excluded from income tax calculations “because of the prevalence of retirement, pension, and social security income which is exempt from local income tax.” Census data allow us to identify specifically what percentage of seniors are still working and what share of their income will be taxable. We find that 12 percent of Ann Arbor seniors (65 years and above) report some wages and salaries.

The following summarizes information drawn from the 1992 Household Study:

#### I. Total Number of Households

Sample Size	2913
divided by: Sample as a % of Total Households	6.6%
Total number of Households in Ann Arbor	43,988

#### II. Number of Owner/Renter Households

Owners as % of Households	47%	Renters as % of Households	53%
multiplied by: # of households	43,988	multiplied by: # of households	43,988
# owners in AA	20,674	# renters in AA	23,313

#### III. Owner Household Breakdown

Seniors (60+) as % of Households	18.7%	Students as % of Households	26.2%
multiplied by: % Seniors who own	68.7%	multiplied by: % Students who own	20.3%
multiplied by: # of households	43,988	multiplied by: # of households	43,988
# Senior owner households	5,651	# Student Owner households	2,340

#### IV. Renter Household Breakdown

Seniors as % of Households	19.7%	Students as % of Households	26.2%
multiplied by % Seniors who rent	31.3%	multiplied by: % Students who rent	79.7%
multiplied by: # Households	43,988	multiplied by: # Households	43,988
# Senior Renter Households	2,712	# Student Renter Households	9,185

## Appendix H

### Rent Model

The rental market in Ann Arbor is one that seems most affected by shifts in supply and demand not induced by taxes but by interest rates and general investment incentives. Major changes in rental prices have been caused by shifts in supply rather than by changes in the cost structure of rentals. Meanwhile, changes in property taxes have been relatively few and fairly small. Indeed, little correlation has been shown between changes in taxes and changes in rent in real terms.

Data from the city and the University of Michigan allow us to go back only six to seven years -- not enough to run a reliable regression analysis. Through the use of a price index, however, we can get an idea of percentage changes in rent during this period (see Table H-1). The rent in dollars denotes our calculation of Ann Arbor average rent from 1990 to 1996, while the price index is taken from the national CPI information. Our calculation of the real rent index involves the division of rent in dollars by the price index, with the year 1990 as the base year.

**Table H-1: Comparing Local Rent Index and National Price Index**

	1990	1991	1992	1993	1994	1995	1996
Rent (\$)	401.25	414.30	420.31	423.66	446.29	454.92	473.71
Price Index	104.35	108.47	111.48	114.38	116.95	119.56	122.24
Real Rent Index	100.00	99.33	98.05	96.32	99.24	98.95	100.78

Source: University Housing Office, University of Michigan; City of Ann Arbor.

**Table H-2: Vacancy Rates of Rental Housing around UM Campus**

	1990 <sup>^</sup>	1991	1992	1993	1994	1995	1996
Rooms	10.0%	14.0%	3.4%	0.0%	0.0%	0.0%	2.2%
Efficiencies	10.8%	3.6%	2.7%	0.5%	0.3%	0.0%	0.7%
1-Bdm	3.6%	2.3%	2.2%	0.3%	0.7%	0.0%	0.3%
2-Bdm	8.7%	6.7%	3.0%	0.2%	0.2%	0.0%	0.3%
3 & 4 Bdms	3.9%	5.8%	2.5%	0.4%	0.5%	0.0%	0.6%
5 & 6 Bdms	3.6%	2.1%	6.0%	0.0%	0.9%	0.0%	0.0%
Overall Rate	7.0%	4.8%	2.8%	0.0%	0.4%	0.0%	0.4%
# of realtors	24	33	36	33	29	33	83*

**Notes:**

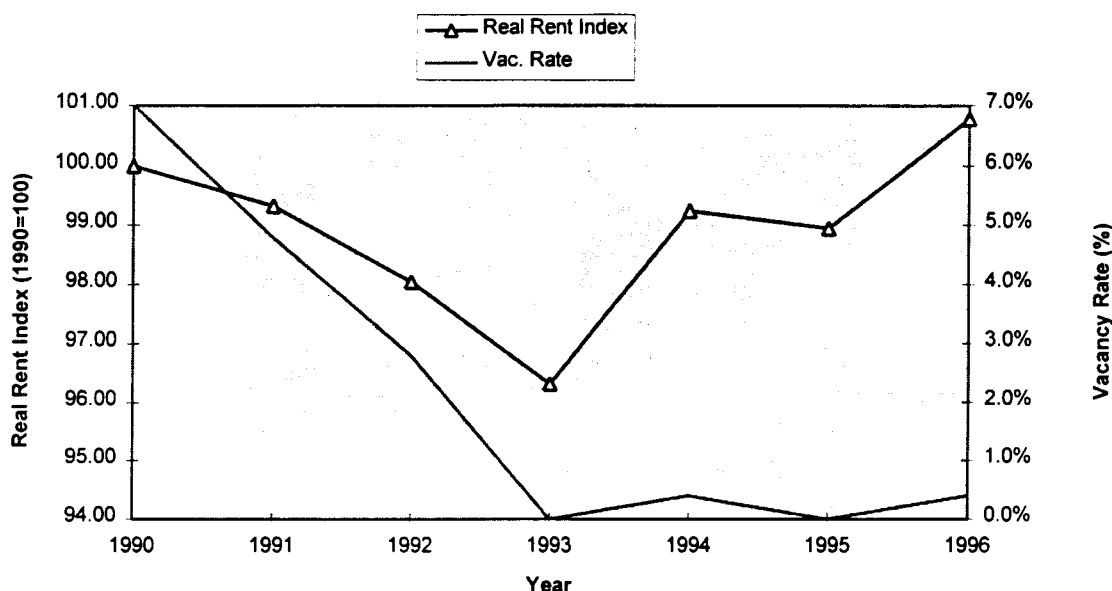
<sup>^</sup> The category of 3 & 4 bdms (bedrooms) is termed "3 bdm & larger apts", whereas the category of 5 & 6 bdms is termed "whole houses"

\*# of property owners and managers registered with the Off-Campus Housing Program.

Source: University Housing Office, University of Michigan.

The overall vacancy rate mentioned in Table H-2 is the average vacancy rate of all rental housing registered with the University. In Figure H-1 below, we observed a correlation between the vacancy rate and real rent index. From this, we might expect that the vacancy rate plays a role to influence the real rent, as will be discussed in the formal models later.

**Figure 1: Vacancy Rates and Real Rent Index, 1990-1996**



Analysis of the data is complicated by the fact that a supply shift occurred from 1985 to 1991 which dramatically changed the rental situation in the city. As time has passed, however, demand has caught up with supply. As a result, real rent fell during the early 1990s and then rose again. The data in Tables H-1 and H-2 indicate that the movement of vacancy rates and the real rent index mirror one another. Using 1990 as the base year, the real rent index declines each year to a low of 96.3 in 1993. In 1994, the index jumps nearly three points to a level of 99.2 which remains almost the same (99.0) for 1995. By 1996, the rent index is at 100.2 which is almost exactly where it began. The trend for vacancy rates was quite similar in that it too declined from a high of seven percent in 1990 to a low of zero percent in 1993. Ann Arbor's vacancy rate increased minimally in 1994 and has hovered around zero through 1996. Figure H-1 illustrates the correlation between vacancy rates and rental rates.

We utilized two models to analyze the demand for rentals and how it changes. The first model is called the "market clearing model," in which price flexibility with no vacant rental housing is assumed. While this assumption may run contrary to what is expected in

reality, this model is useful because it captures important variables such as rental, interest and tax rates, as well as population and housing prices.

The demand side (Equation 1) involves rental housing demand as a negative function of rental rates (R), while the city population (Pop), and housing prices (H<sub>p</sub>) are positive functions upon the demand for rent.

$$RH_d = f(R, Pop, H_p) \quad (Eq. 1)$$

On the supply side (Equation 2), we assume a positive impact of rental rates (R) upon the rental housing supply (RH<sub>s</sub>), while interest rates (I) and property taxes (T<sub>p</sub>) negatively impact the supply of rental units.

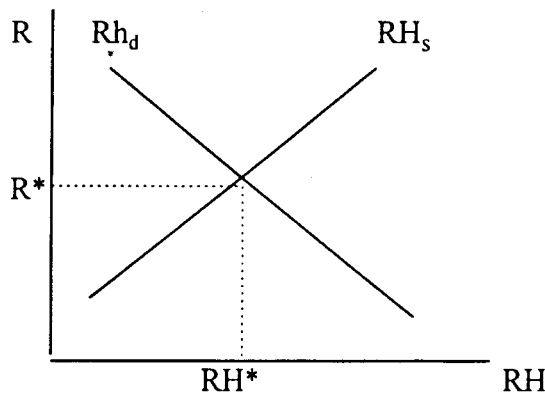
$$RH_s = g(R, I, T_p) \quad (Eq. 2)$$

Based upon this model, we attempted to run a regression analysis of the data listed in the appendix. The two equations used for the regression are followed by a graphical illustration.

$$RH_d = a_0 - a_1 * R + a_2 * Pop + a_3 * H_p \quad (Eq. 3)$$

$$RH_s = b_0 + b_1 * R - b_2 * I - b_3 * T_p \quad (Eq. 4)$$

Figure H-2: The Market Clearing Model



Using the assumption of a market clearing model, rental housing demand and supply will equal one another. In other words, Equation 3 and 4 will be equal, and the following regression model will emerge (Equation 5).

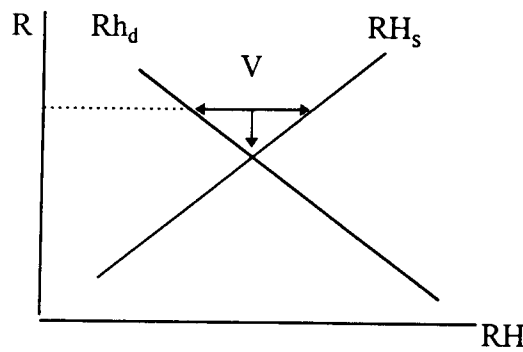
$$R = (a_0 - b_0 / a_1 + b_1) + (a_2 / a_1 + b_1) * Pop + (a_3 / a_1 + b_1) * H_p + (b_2 / a_1 + b_1) * I + (b_3 / a_1 + b_1) * T_p \quad (Eq. 5)$$

However, given that most variables possess a similar trend in the past six years, we believe there are multicollinearity problems within this analysis. More data is required to solve these problems.

Another way to look at how taxes might impact rent would be to evaluate the relationship between vacancy rates and changes in rental prices. In this case, the change in the real rent index ( $dR / R$ ) is a negative function of the vacancy rate ( $V$ ), as shown in Equation 6 and Figure H-2. When vacancies were high, up to 1993, real rent fell. When vacancies were low, after 1993, real rent rose.<sup>1</sup>

$$(dR / R) = - f(V) \quad (\text{Eq. 6})$$

Figure H-3: The Vacancy Model



This is not as direct a method of understanding the effects of property taxes upon rental rates. Still, it may be more salient in explaining changes in the demand for rental units in general. Perhaps there can be a method of applying this scheme to speak to the tax issue. The argument is that, in the short term, rental prices may not change dramatically. With increased profitability accorded to the renting business, however, it is possible that the supply of rental units will increase. This in turn drives rental prices down to a “market-clearing” level in the long term as demand and supply converges. However, with imperfect market information, such an equilibrium is difficult to determine empirically.

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<sup>1</sup> An article from the November 1996 issue of *Ann Arbor Observer* states that twelve new apartment complexes were built between 1986 and 1991 which added almost 3000 new rental units. During that period, vacancy rates in Ann Arbor rose from less than one percent to as much as seven percent. As the growth in supply declined after 1991, vacancy rates also decreased back to levels below one percent by 1994. With declining vacancy rates, one sees a trend towards increased rental prices. Given the competitiveness of the market, rental rates seem on average to increase at a rate similar to inflation if vacancy rates are very low. This is an excellent example of the vacancy rate model of rents as opposed to the market clearing model which involves interest rates and taxes.



This analysis, therefore, while not complete, leads us to the conclusion that property owners will reap the immediate benefit of a tax shift, while renters would lose out at least during the short term. Whether these changes will persist in the long term is difficult to gauge, given uncertainty with regard to market demand and supply. Still, with no market intervention, the demand and supply of rental housing, as well as the rental rates, will tend to converge close to the “market-clearing” level that may prevent renters from losing in the long term.

### ***Bibliography***

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# APPENDIX I

## Impacts on University of Michigan Employees

Since the University of Michigan (UM) is the largest employer in Ann Arbor, we include this separate section to discuss the broad impacts of the city income tax proposal on UM employees. In this Appendix, we show the city tax revenue that would be generated from the income of UM employees if Ann Arbor were to adopt a 1 percent city income tax.<sup>2</sup> We subcategorize these employees into Ann Arbor residents, non-Ann Arbor Michigan residents (in-state commuters), and those that live outside of Michigan (out-of-state commuters).<sup>3</sup> We do not show decile distributional impacts for the university because the data are not available.

We used the university's aggregated federal taxable gross income (TGI) paid out to all university employees for the 1995 tax year. This TGI came from the 1995 university W-2 database. Each of the employees in the database had a federal and state tax liability on earnings they received from the university during the tax year.

One special feature of this appendix is a discussion of the likelihood that the Census data undercounts the non-Ann Arbor, non-Michigan population and associated wages that would be subject to the proposed city income. We include in our discussion the apparent size of the undercounting, possible explanations for it, and its possible impact on projected total income tax revenues.

### General Findings

The university had 52,406 employees who would be subject to a city income tax. These university employees earned a TGI of \$1.02 billion. The proportion of Ann Arbor residents was slightly less than 47 percent (24,486 of the 52,406 employees). They earned wages in the amount of \$484 million, or slightly more than 47 percent. To calculate the tax revenue they would generate, we subtract out a \$600 per person exemption multiplied by the average household size (2.9 for Ann Arbor) as follows:

- Revenue:  $[\$483,741,660 - (24,486)(\$600)(2.9)](.01) = \$4,411,360$
- Per capita tax:  $\$4,411,360 / 24,486 \text{ employees} = \$180 / \text{employee}$

The proportion of non-Ann Arbor residents subject to the city income tax was 53 percent (27,920 employees out of 52,406). They earned wages in the amount of \$537 million.

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<sup>2</sup> We exclude the approximately 3000 employees who work on the Dearborn and Flint campuses because they would not be taxable under UCITA.

<sup>3</sup> These are non-Michigan U.S. residents and non-U.S. residents who do not have a Michigan Tax Exclusion Certificate on file at the university Payroll Office. We assume they all worked on the Ann Arbor campus.

We split these non-Ann Arbor residents into two components: non-Ann Arbor Michigan residents (in-state commuters), of which we found 24,799 who earned \$505 million; and non-Michigan residents (out-of-state commuters), of which we found 3,124 who earned \$32 million. We use an average household of 3.07 for both groups.<sup>4</sup> City income tax revenues that would be generated by these non-Ann Arbor residents are as follows:

Non-Ann Arbor Michigan Residents (in-state commuters)

- Revenue:  $[\$504,868,894 - (24,799)(\$600)(3.07)](0.005) = \$2,295,946$
- Per capita tax:  $\$2,295,946 / 24,799 \text{ employees} = \$93 / \text{employee}$

Non-Michigan Residents (out-of-state commuters)

- Revenue:  $[\$31,783,423 - (3,124)(\$600)(3.07)](0.005) = \$130,514$
- Per capita tax:  $\$130,514 / 3,124 \text{ employees} = \$42 / \text{employee}$

It is this last group of UM employees (3,124 out-of-state “commuters”) that may be underrepresented in the Census data.<sup>5</sup> Our earlier results in Chapter 5 included only 800 nationwide employees who live neither in Ann Arbor nor Michigan suburbs of Ann Arbor but who work in Ann Arbor. However, UM data identifies 3,124 employees in this category. This discrepancy is explained simply by the fact that the Census data are unable to capture this complete subgroup. To explain the Census’ inability to capture this data we looked at the “form” of the university data and the “secondary income” attribute of employees in this population. Because the university W-2 data reflect a snapshot in time of employees and their income (at the end of the calendar year), it is likely that some of the people in this population relocated during the academic school year. While they received their W-2 at a residence out of state (their new residence), they worked part of the year in Ann Arbor. On the Census they would have reported their current location as their place of work. Likewise, if they work at UM on a seasonal basis (e.g. the spring and summer terms), their income would be “secondary,” and once again the Census would not report an Ann Arbor work location.

Our earlier results estimated city income tax revenue of \$43,500 from this subgroup. Here, we have computed \$130,000. The implication is that there may be an extra \$86,500 of revenue not included in the report that potentially could be realized.

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<sup>4</sup> The average household size for non-Ann Arbor residents comes from the Census data for Ann Arbor suburbs. We use the same average household size in calculating non-Michigan resident tax revenues for lack of better data.

<sup>5</sup> Census data reported only 800 employees who work in Ann Arbor and live outside the state of Michigan while UM data showed 3,124 employees in this category. According to the UM database, these 3,124 employees incurred both state and federal tax liabilities. Our rationale for including them in the city tax revenue calculation is that the university data are more accurate than the Census data because they represent actual numbers. These 3,124 employees most likely worked on the Ann Arbor campus in the summer or moved during the academic year. In both cases, they would have a city income tax liability. According to UM payroll personnel the university withholds taxes for all of these employees.