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The Impact of Interstate Mobility on the Effectiveness of Property Tax Reduction in Georgia

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Introduction

Efforts to limit property taxes began shortly after the adoption of the modern property tax in the 19th century. Fisher (1996) examines the history of the property tax in the United States, and Sjoquist (2008) traces the history of the property tax in Georgia. Over the years, policies to limit the growth in property tax receipts have included limits on the millage rate, on increases in assessments and on the tax levy. Mullins (2003) provides a survey of these policies.[1]

In the past 10 years, except for a hiatus during the Great Recession, several states have attempted to eliminate, or at least to substantially reduce, property taxes. For example, in 2006, Texas reduced the property taxes for schools by one-third, which resulted in a 20 percent reduction in total property tax receipts.[2] In 2008, the state of Indiana assumed responsibility for the full cost of school operations and transportation, child welfare, and other services, resulting in a 38 percent reduction in property tax receipts. To finance this increase in state expenditures, Indiana increased its sales tax rate by one percentage point. In November 2008, Florida was set to vote on Amendment 5, which would have prohibited the state legislature from requiring school districts to levy a property tax. The state was to assume responsibility for funding education, with an increase in the sales tax rate being used to generate the necessary revenue. A court challenge made its way to the Supreme Court of Florida, which found that the proposed amendment was vague and struck down the referendum. In 2008, the Georgia legislature considered a proposal (described in Section 2) to replace the school property tax on homesteaded properties with a revenue-neutral increase in sales tax revenues. Although the proposal did not pass, it came close. More recently, proposals to cut property taxes have been advanced in New Jersey (a 20 percent cut), New York (a $1.7 billion cut), Pennsylvania (a $3.8 billion cut) and Texas (a $2.5 billion cut).

We develop a computable general equilibrium (CGE) model and a microsimulation model (MSM) to analyze the economic and welfare effects of the Georgia proposal, which would have effectively eliminated school property taxes on homesteaded properties and replaced the lost revenue with a revenue-neutral increase in the state sales tax. A CGE model is a system of equations that are derived from maximizing behavior of consumers and firms. The system of equations is solved for the unique market equilibrium, where market prices equate quantity demanded and quantity supplied in each and every market. An MSM contains detailed information on a large number of households. It consists of a set of equations that must satisfy certain adding-up restrictions (i.e., balanced budget constraint, supply equals demand, and so on) rather than optimizing behavior, as in a CGE model.

Several studies have used CGE models to investigate specific aspects (for example, the effect on revenue stability or tax incidence) of proposals to replace property taxes with an increase in sales tax revenues. For example, DiMasi (1987) and Choi and Sjoquist (2015) explore shifting from a capital property tax to a

[1] Also see Haveman and Sexton (2008).

[2] The property tax reduction was financed through a restructuring of the state's business tax, an increase in the taxes on tobacco products, and a surplus in the state budget.

land value tax in an urban CGE model. However, we are aware of only three studies that analyze policies to reduce property taxes using CGE models that are relevant to the current study: Waters, Holland and Weber (1997); Julia-Wise, Cooke and Holland (2002); and Thaiprasert, Faulk and Hicks (2013). These prior studies examine the potential effects of a significant reduction in property taxes in Oregon, Idaho and Indiana, respectively. In particular, these papers consider Ballot Measure 5, which passed in Oregon in 1990; Idaho's proposed One Percent Initiative, which was defeated in 1996; and Indiana's legislative changes to the property tax adopted in 2008.

The CGE models in Waters, Holland and Weber (1997) and Julia-Wise, Cooke and Holland (2002) are very similar to one another. Both models consist of two sectors: a goods sector and a services sector in the Waters, Holland and Weber paper, and a tradable goods sector and a non-tradable goods sector in the case of Julia-Wise, Cooke and Holland. In both of these models, production uses capital, labor and proprietors' services to produce goods and services according to a Cobb-Douglas production function (C.W. Cobb and P.H. Douglas, 1928).[3] The quantities of the factors of production are fixed. Both papers consider a large decrease in the property tax rate, with the local revenue being replaced by state revenue in the case of Oregon.

These models have several limitations. Some of the technical assumptions in the models impose restrictions on demand and supply elasticities that may not be consistent with the actual economy that we are attempting to simulate. Housing is combined with other goods and services to form a composite good. Thus, there is no separate demand for housing that is dependent on the tax-inclusive price of housing. Furthermore, the property tax is modeled as an income tax: property tax revenue equals the product of the tax rate and income, and thus, does not depend on the amount of or price of housing.[4] By treating the property tax in this manner, the model ignores the incentive effects of a change in relative prices between housing and all other goods that would result from a reduction in the property tax rate. The quantity of capital and labor is assumed to be fixed but mobile across sectors.[5] The reduction in property taxes reduces government spending on non-educational services, but government services are not included in the consumers' utility functions.

Thaiprasert, Faulk and Hicks (2013) consider a reduction in property taxes and a revenue-neutral increase in the sales taxes. Their CGE model is based on the Washington-Idaho CGE model (Holland, Stodick and Devadoss 2004) but is adjusted to allow for more detailed tax analysis and a more detailed housing sector than the two papers discussed above. They consider both a short-run scenario in which capital is fixed and a long-run scenario in which capital is mobile.

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[3] A production function is a mathematical model that converts factors of production (e.g., capital and labor) into output (e.g., agricultural goods, manufactured goods and so on). A Cobb-Douglas production is a specific function form, $y = K^{a}L^{1-a}$, where y is a good, K is the stock of capital, L is the stock of labor and $0 < a < 1$ is a parameter of the function reflecting the productivity of the factor in the production of y. Note that if the exponents sum to one, it means that the technology exhibits constant returns to scale.

[4] This is not an inherent weakness of CGE modeling because it would be possible to introduce housing as a separate sector with its own production technology. However, this approach has rarely been taken.

[5] In our approach, we assume labor is sector- and state-specific, whereas capital is perfectly mobile.

Our CGE model, which is a modification of that used in Condon et al. (2015), explores the effects of significantly reducing or eliminating Georgia's income tax and implementing a revenue-neutral increase in the state sales tax. We incorporate the results from the CGE model into an MSM to analyze the effects of the proposed property tax reform on changes in housing choice (owner vs. renter) and changes in the distribution of consumption by income category. We do so by linking the aggregate outputs from the CGE model to an MSM using disaggregated data in a "top-down" fashion.[6] As discussed in greater detail below, there is only a loose connection between the two models. However, this modeling approach (see Agénor, Chen and Grimm 2003, Lofgren, Robinson and El-Said 2003, Feltenstein et al. 2014 and the references therein) has been used to gain more detailed insight into the distributional consequences of policy reforms than is typically provided in a CGE model.

Our analysis differs from the three papers discussed above in several ways. First, we consider a more complex policy in which the property tax on homesteaded property is reduced and currently untaxed goods and services are added to the tax base to make the reform revenue neutral. Our model contains 15 goods and services producing sectors, including currently taxed goods, goods and services that are added to the sales tax base, and goods and services that are never taxed.[7] Second, our CGE model has a dynamic, discrete time structure. Third, our analysis is done in the context of a regional model in which trade among Georgia, its five contiguous states, and the rest of the United States (henceforth ROUS) is endogenously determined. Additionally, all intermediate and final goods are perfect substitutes, so we do not need to estimate cross-price trade elasticities. In other words, we assume that peanuts, electricity or automobiles produced in Alabama are identical to the peanuts, electricity or automobiles produced in Georgia.

Finally, we build an MSM to obtain more detailed implications by income class of the aggregate results from the CGE model. As previously noted, a CGE model assumes one representative agent or consumer. The MSM allows us to increase the number of agents or consumers in the model, say, low-, medium- and high-income consumers. Data on the behavior of multiple agents by income category from the MSM allow us to conduct a distributional analysis to determine the differential effect of the proposed tax reform on low-, medium- and high-income consumers. Because only the tax on homesteaded property is reduced, we consider the effect of the reform on housing tenure choice by allowing residents to shift between rental and owner-occupied housing within the MSM. We model the property tax as an excise tax on the rental value of property.

The rest of the paper proceeds as follows. Next, we describe the Georgia proposal to reduce property taxes. Following that is a description of the CGE model, and the fourth section discusses the outcomes of that model. The next section presents the MSM and its results. The last section concludes.

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[6] Our modeling strategy is "top-down" in the sense that we use the CGE model to obtain results assuming a representative consumer; then, we use an MSM to obtain results in a more disaggregated fashion.

[7] The choice of 15 sectors is somewhat arbitrary. There is a trade-off between increasing the number of sectors in the model and computation feasibility. Consequently, models with 10 to 20 sectors are standard practice in this literature due to limitations on computation feasibility.

The Georgia Proposal

The Georgia proposal to eliminate the school property tax on homesteaded property was the third in a line of related proposed tax reforms. The first proposal (HR 900) was made at the end of the 2007 session of the Georgia General Assembly and called for a change in the current personal income tax (PIT), the adoption of a value-added tax, and the elimination of nearly all other state and local taxes including all property taxes.

By late spring, HR 900 was replaced by a new proposal that called for the elimination of all property taxes but not the elimination of any other tax. The plan was christened the GREAT Plan for Georgia, which stood for "Georgia Repealing Every Ad-valorem Tax." To replace property tax revenues, the proposal called for increasing sales tax revenue by eliminating current sales tax exemptions and taxing services. Local governments were promised that the change would be revenue neutral, but the mechanism for accomplishing this was not specified in the legislative package. When it appeared that the plan would not pass the legislature, the GREAT Plan was replaced by a third proposal.

The substantive version of the revised GREAT Plan, which we refer to as the GREAT Plan II, contained several proposed changes, two of which we focus on in this paper. First, property taxes on homesteaded property used to fund K-12 education were to be eliminated by providing a state-funded property tax credit to each homeowner equal to the school property tax levy. Second, to finance the credit, sales tax revenues were to be increased in two ways:

- by eliminating the current sales tax exemption for food-for-home consumption with a refundable income tax credit equal to food expenses for families with incomes less than 200 percent of the state poverty level, and
- by adding 174 personal services to the sales tax base. The legislation specified 174 NAICS codes to indicate which services would be subject to the sales tax. Only the state 4 percent sales tax rate would apply to these services, not the various local option sales taxes.

Although the legislation did not pass, we analyze the GREAT Plan II as an example of a large-scale property tax proposal. In the next section, we describe the CGE model that we use to analyze this proposal.

We chose Georgia for our simulated reform, in part, for convenience but also because Georgia considered reducing the property tax and recovering the lost revenue by broadening the sales tax base to include services. We compared the Georgia proposal to that of five neighboring states, which we chose in part for convenience but also because we wanted to consider a diverse set of states. The comparison states are the five states bordering Georgia: Alabama, Florida, North Carolina, South Carolina and Tennessee. These five comparison states vary in size, with some larger and some smaller than Georgia, and have interesting differences in their economic and tax structures. Finally, the six states together represent a regional economy.

Before explaining the model in detail and discussing the simulation results, we briefly describe the six states that are the focus of this study. As reported in Table 1, Florida has the largest economy in terms of gross state product (GSP) of the six states at $736.7 billion, which is nearly twice that of Georgia. These six states account for 15 percent of the gross domestic product (GDP) of the United States. In column two of Table 1, we report state and local government expenditures as a share of GSP by state. These shares range from 14.1 percent in Georgia to 18.5 percent in North Carolina.

Column three of Table 1 indicates considerable diversity in the tax structures of these six states. Florida raises the most tax revenue as a share of GSP (9.1 percent), and Tennessee raises the smallest share (5.1 percent). Florida does not have a personal income tax (PIT) and makes up the forgone revenue by collecting a larger share of total tax revenue from capital taxes than the other five states. Aside from a small tax on capital gains, Tennessee also lacks a PIT, but in contrast to Florida, Tennessee recovers the forgone revenue by collecting a larger share of revenue from the sales tax than the other five states.

Table 1. Size of State Economies and Tax Structures Prior to Proposed Tax Reform in Georgia

REGION	GROSS STATE PRODUCT (GSP) (BILLIONS $)	SHARE IN GSP OF		SHARE IN TOTAL TAX REVENUE OF		
		STATE AND LOCAL EXPENDITURES (PERCENT)	STATE AND LOCAL TAX REVENUE (PERCENT)	CAPITAL TAXES (PERCENT)	SALES TAXES (PERCENT)	PERSONAL INCOME TAX (PERCENT)
	(1)	(2)	(3)	(4)	(5)	(6)
Alabama	$169.0	16.5	7.2	41.0	34.9	24.1
Florida	$736.7	14.5	9.1	59.6	40.4	–
Georgia	**$390.0**	**14.1**	**6.1**	**53.8**	**12.1**	**34.1**
North Carolina	$410.1	18.5	6.6	39.9	22.8	37.2
South Carolina	$158.3	14.8	6.4	60.3	10.6	29.1
Tennessee	$240.5	16.2	5.1	55.7	42.4	1.9
Rest of the U.S.	$12,018.1	14.2	8.4	51.8	22.5	25.7
United States	$14,122.7	16.2	8.3	52.0	23.6	24.4

In short, there is considerable diversity in the size of these six state economies as well as in the states' tax structures. These differences make it essential to specify the individual structures of Georgia and the surrounding states rather than simply treating all states as being economic replicas of one another.

The CGE Model

The Georgia property tax proposals generated a lot of discussion and some analysis, but to date no research has focused on the general equilibrium effects of GREAT Plan II, including its incidence and distributional effects. Because GREAT Plan II is a major tax reform, it is likely to induce large changes in economic behavior across many sectors of the economy. Thus, we estimate these economic effects using a CGE model, which can account for the interactions among the various sectors of the economy. In this section, we describe the CGE model. Later in the report, we describe the MSM, which produces a more detailed distributional analysis.

Our CGE model is similar to that used in Condon et al. (2015); thus, we only summarize the main features of this model. The CGE model considers Georgia, its five border states and the ROUS. The feature that most distinguishes our CGE model from that of others is how we model interstate trade. CGE models that allow for trade generally incorporate the so-called Armington assumption that goods produced in different regions or countries are imperfect substitutes for one another (see Armington 1969). The Armington assumption has been widely used in CGE models since its introduction in the ORANI model of Australia (see Dixon et al. 1982). Instead, we use a non-Armington approach in which goods traded between states are viewed as being identical and thus perfect substitutes in production and consumption, which we believe has a number of advantages in a multiregional model of a highly integrated common market, like that of the United States. As discussed below, the non-Armington approach has several advantages.

The typical Armington version of a multiregional economy requires all traded good to be imperfect substitutes. If they are not, then there will be corner solutions in which regions completely specialize in a particular good. For example, Georgia might specialize in producing peanuts, and no other state would produce peanuts. An additional technical problem with using Armington trade models for numerical analyses is that having sector-specific labor categories greatly increases the dimensionality of the model, making the solution more complex. A useful feature of our model is that sectoral wage rates in each region are derived from a “backwards solution” in which output prices are determined nationally and then taken as given by the individual states in our model. Capital is assumed to be perfectly mobile. In other words, in this model, we assume that capital instantaneously moves to the economic sector and state where it receives the highest rate of return. As a result, the rate of return on capital in equilibrium must be equal in all economic sectors and in each state, resulting in a national price for capital. The sectoral value added in each region is determined from the national prices of the sectoral outputs as well as from the intermediate costs derived from the regions’ input-output (IO) matrices. Once both a sector’s nominal value added and the national price of capital have been determined, the sector’s wage rate (price of labor) is calculated as a residual. Condon et al. (2015) further describes how one can implement the non-Armington assumption.

We aggregate all commodities into 15 “industries” and assume that all output is produced with a combination of intermediate inputs and value added from labor and capital. We follow the common practice of describing the structure of intermediate inputs with an input-output (IO) matrix, and we therefore assume that intermediate inputs enter the production process in fixed proportions.[8] The 15 industries are agriculture, mining, utilities, construction, housing, manufacturing, trade, transportation, financial services, real estate, three services sectors (those services that are currently taxed; those that are proposed to be taxed; and those that are never taxed), federal government, and state and local government. With regard to labor, we assume that each state has 15 representative agents who allocate their labor across the state’s 15 industries. These agents represent the initial workforce in each industry, but fractions of each agent can migrate across industries and states between any two periods, taking fractions of their labor endowments and assets with them. For example, an agent may have an endowment of 100 units of capital or labor. In the pre-reform economy, the agent may allocate all 100 units of capital or labor to the agricultural sector in Alabama. In the post-reform economy, the agent may take a fraction, say one-fourth of his endowment of capital or labor, and allocate it to manufacturing in Georgia because of the effect of the proposed tax reform on the returns to capital and labor by sector and state.

During any given period, labor supply is specific to individual industries in individual states so that wages differ across industries and states. We permit workers to migrate across states and across industries after each period, with the migration depending on the relative wages in the different states and industries. In contrast to capital, which we assume is perfectly mobile across economic sectors and states, we assume that labor is not perfectly mobile. We assume that transactions costs prevent labor from instantaneously migrating or moving to the sector and state with the highest wage rate. We use functions, which we refer to as labor migration functions, to account for these transaction costs or frictions that prevent labor from instantaneously migrating to the sector and state with the highest wage rate. We use observed changes in employment across industries and states to calibrate the labor migration functions; these migration functions introduce frictions that prevent instant wage equalization across industries and regions and also prevent sudden large movements of labor across states. Because we assume that capital is perfectly mobile, there is one national price in equilibrium. In contrast, wage rates can differ among sectors and among states because we assume that labor is not perfectly mobile due to the transactions costs or frictions from moving from one sector or state to another sector or state.

[8] An IO table is a matrix or array of numbers that describes the value of the intermediate goods or materials (electricity, steel, plastic and so on) and factors of production (capital and labor) used to produce the final consumption goods in the economy. For example, an IO table would include domestic produced grapes and imported grapes. Some of these grapes are intermediate goods or materials in the sense that they are used to produce other goods (wine, grape juice and so on). Some of these grapes may be exported, and some may be used for final consumption. For each economic sector in the model, the IO table summarizes the origin of the commodity (domestic production or imported), the materials used in domestic production of the commodity, and the final use of the commodity (i.e., intermediate use, export or final consumption).

We model the consumption-saving decision problem of each representative agent in the conventional manner.[9] All governments make transfers to consumers, invest in government assets (bonds), and demand intermediate inputs to produce public goods. They finance these expenditures by levying a corporate income tax on the use of capital, property taxes on the use of capital and land, personal income taxes on labor and asset income, and sales taxes on the consumption of goods and services, as well as by issuing public debt. In our model, public bonds have no risk of default and firms have no risk of bankruptcy. Therefore, consumers view the holding of public debt and investment in new capital as equivalent. Consequently, the after-tax rates of return to public debt and investment in new capital must be equal in equilibrium. Tax rates are average effective tax rates, calculated as actual state and local tax revenue for the specific tax in the base year divided by the implied tax base in the base year. We assume that all tax rates, other than those affected by the proposed tax reform, remain unchanged over time, that government spending on public goods is proportional to each state's value of production, and that government transfers are proportional to each state's total income.[10]

To model the tax policy change, we assume that the property tax on capital and land used in producing homesteaded housing services is reduced by one-half because property taxes for education are about half of all property taxes. Lost property tax revenue is partially replaced by expanding the sales tax base to include personal services and food-for-home consumption, which are currently exempt from the state sales tax. However, because the revenue gained from the expansion of the sales tax base may differ from the amount needed to reduce property taxes for homesteaders, we also allow the state sales tax rate to adjust to maintain a balanced budget.

The data for the CGE model are for the year 2009.[11] Other data are from the U.S. Census Bureau's Government Finances webpage[12] and the national and regional webpages[13] of the Bureau of Economic Analysis (BEA). The data and behavioral assumptions in the model reflect annual values. Thus, we

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[9] See, for example, Ballard, Shoven and Whalley (1985). More specifically, we model the consumption-savings decision with a standard set of nested constant elasticity of substitution (CES) and Cobb-Douglas utility functions. We assume that each representative agent chooses an aggregate consumption time path that maximizes a CES lifetime utility function. The agent's elasticity of intertemporal substitution is derived as part of the calibration exercise. The agent then decides, based on a Cobb-Douglas utility function, how to divide the total consumption of goods among the output from the 15 industries. Each consumer demands bonds as an instrument for intertemporal optimization via consumption smoothing. Our specification of the dynamics of capital formation corresponds to the standard macroeconomic formulation of forward-looking representative agents who optimize over time. We determine the rates of time preferences numerically as part of the solution algorithm so that a family's long-run saving rate converges to a stable value, given the family's observed ratio of marginal utility to the price index in period zero. The algorithm is described in detail in Tideman et al. (2002). The advantage of this approach is that the periods can be solved sequentially while maintaining the assumption of perfect foresight, which makes it possible to solve the model for a larger number of periods.

[10] We permit the United States to run a trade deficit with the rest of the world and assume that the rest of the world supplies any quantity of import demand at the prices that prevail in the United States. Consumers finance their demand for imports by selling fractions of their capital stock and of their holdings of government debt to foreigners. Foreigners use their asset revenue and the proceeds from net exports to finance the governments' budget deficits and to invest in new capital in the United States.

[11] The input-output matrices are obtained from IMPLAN, which is a company specializing in producing region IO tables. The regional IO matrices are described in IMPLAN (2009).

[12] See www.census.gov/govs/financegen.

[13] See www.bea.gov.

interpret a period to be equivalent to a year, which is the time required to produce a year's worth of output. As noted above, we follow the standard practice of measuring tax rates as the ratio of tax revenue to the tax base. BEA and IMPLAN data are used to calculate some of the model's parameters. Other parameters, for example the elasticity of substitution between consumption of goods and leisure, are derived from calibrating the model to historical data. However, we require that these elasticities be consistent with the range of values available in the literature. A data file is available from the authors upon request.

Results from the CGE Model

This section begins by describing the baseline simulation and GREAT PLAN II in terms of the trends in four key macroeconomic aggregates — real personal income, real consumption of goods and services, real labor supply and real demand for capital — for the six states in the model and the ROUS. We decompose the key features of the GREAT Plan II into two reforms, which we refer to as options A and B.

We begin by briefly describing the baseline simulation that we use as a benchmark to gauge the effect of Georgia's tax reforms on its economy, on the economies of each of the five comparison states and on the economy of the ROUS. Recall that the model is calibrated to a single year. Hence, the baseline simulation is used for purposes of comparison and should not be interpreted as a statistical forecast of future performance, which it obviously is not.

BASELINE SIMULATION

Table 2 reports the results of the baseline simulation. We report the results for 11 periods because the changes in period-to-period growth rates for additional periods are small. We index each endogenous variable by setting it equal to 100 in the base year, which is reported in the column labeled zero. Thus, the percentage growth rate relative to the base year is easily interpreted from the numbers in Table 2.

Using the growth rate in real personal income as a measure of economic performance, it is evident in Table 2 that Georgia's economy outperforms the other states and the ROUS over the 11 periods in the baseline simulation, with the exception of North Carolina. Real personal income in Georgia increases by about 34 percent over the 11 periods, which is equivalent to an average annual compound growth rate (henceforth, simply the compound growth rate) of about 3.0 percent. This is approximately equal to Georgia's average annual compound growth rate in personal income over the 1990-2008 period, which was 3.9 percent.

Table 2. Baseline Simulation of Key Macroeconomic Variables by Region and by Period

STATE	PERIOD 0	1	2	3	4	5	6	7	8	9	10	COMPOUND ANNUAL GROWTH RATE*
Real Personal Income												
Alabama	100	98	9	101	103	106	108	112	116	121	126	2.34%
Florida	100	99	101	103	105	108	111	114	118	122	127	2.45%
Georgia	**100**	**98**	**100**	**102**	**104**	**108**	**111**	**116**	**121**	**127**	**134**	**2.99%**
North Carolina	100	99	101	10	106	110	114	119	124	131	138	3.26%
South Carolina	100	98	99	10	103	106	109	113	118	123	129	2.57%
Tennessee	100	98	99	101	103	106	109	113	117	122	128	2.47%
Rest of U.S.	100	99	100	102	105	108	111	115	120	125	132	2.80%
United States	100	99	100	102	105	108	111	115	120	125	132	2.78%
Real Consumption of Goods												
Alabama	100	97	97	97	97	98	99	101	102	104	105	0.52%
Florida	100	98	98	99	100	102	103	105	107	109	111	1.06%
Georgia	**100**	**97**	**97**	**98**	**99**	**100**	**102**	**104**	**106**	**108**	**110**	**0.96%**
North Carolina	100	98	98	98	99	101	102	104	106	108	110	0.98%
South Carolina	100	97	96	97	97	98	99	100	102	103	105	0.46%
Tennessee	100	97	97	97	98	100	102	104	106	109	111	1.05%
Rest of U.S.	100	98	99	99	100	101	101	103	103	104	105	0.53%
United States	100	98	99	99	100	101	102	103	104	105	106	0.60%
Real Labor Supply												
Alabama	100	97	96	95	94	92	91	90	89	88	88	-1.30%
Florida	100	99	99	98	97	96	95	94	93	92	92	-0.86%
Georgia	**100**	**98**	**98**	**97**	**97**	**96**	**96**	**96**	**95**	**95**	**96**	**-0.46%**
North Carolina	100	98	96	95	94	93	93	92	91	91	91	-0.98%
South Carolina	100	98	97	96	94	93	92	91	91	90	90	-1.09%
Tennessee	100	98	96	95	94	93	91	90	89	88	88	-1.32%
Rest of U.S.	100	98	96	95	94	93	92	92	91	91	90	-1.01%
United States	100	98	97	96	94	93	93	92	91	91	91	-0.99%
Real Demand for Capital												
Alabama	100	100	102	104	107	110	113	117	121	126	133	2.85%
Florida	100	101	103	106	109	112	116	121	126	133	140	3.40%
Georgia	**100**	**99**	**102**	**105**	**109**	**113**	**118**	**123**	**130**	**137**	**145**	**3.82%**
North Carolina	100	100	10	105	109	112	117	122	127	134	142	3.56%
South Carolina	100	99	101	104	107	111	115	120	12	132	123	2.07%
Tennessee	100	100	102	105	108	111	115	119	124	129	136	3.11%
Rest of U.S.	100	100	102	104	107	110	114	118	123	129	136	3.09%
United States	100	100	102	104	107	110	114	118	123	129	136	3.13%

*Growth rates were calculated using non-rounded values of the macro variables.

It is difficult to determine how well the model represents the true dynamics of the states analyzed. The simulation is forward looking and out of sample, so it cannot be taken to directly represent any historical time period. In addition, the model is calibrated to a single year, as it is not possible to replicate dynamic paths for all states simultaneously. In reality, policy parameters change from year to year, so any simulation in which we assume that these parameters remain constant cannot hope to perfectly replicate historical dynamic paths. In fact, such difficulties would remain even in a model for a single region, state or country. In general, attempts to replicate the dynamic path of a macro-economy can only approximate the actual economy, requiring subjective judgment as to whether the model is a "good" replica of the actual economy being modeled.

Real consumption of goods and services increases modestly over the 11 time periods in all six states, including the ROUS. Alabama and South Carolina experience the smallest increases in real consumption in the six-state region. In terms of the growth rate in the real demand for capital, Georgia and North Carolina lead the other states in the region and the ROUS over the 11 periods of the baseline simulation. Finally, real labor supply is decreasing in all six states and the ROUS over the 11-period time horizon. Georgia has the smallest decrease (in absolute value) in real labor supply, with Florida coming in a distant second. The remaining states have negative compound growth rates of labor supply between -0.98 to -1.32 percent, as compared to -0.46 and -0.86 in Georgia and Florida, respectively.

OPTION A

This section examines the effect of option A on the same set of macroeconomic variables used in the baseline simulation. Option A consists of adding personal services and food-for-home consumption to Georgia's sales tax base and instituting a revenue-neutral decrease in the property tax rate on owner-occupied housing. Table 3 reports the simulation results.

As a result of this reform, the compound growth rate of real personal income in Georgia decreases from 2.99 percent in the baseline simulation to 2.85 percent in the simulation of option A. This decline in the growth rate in real personal income in Georgia suggests that the proposed reform is more distortionary than the baseline tax system. This finding illustrates the importance of careful and detailed modeling of tax reform proposals.[14] Furthermore, the simulation of option A shows that the decline in the growth rate in real personal income in Georgia ripples through the regional economy, decreasing the growth rates in real personal income in the other five states as well.

[14] See, for example, Zodrow (2001) and the references therein for an insightful discussion of the various theories of the incidence of a local property tax. Briefly, Zodrow and his frequent coauthor Mieszkowski contend that from the perspective of a single taxing jurisdiction, the property tax is largely borne by the local owners of labor and land in the taxing jurisdiction. However, the distortions depend on the property tax rate in the jurisdiction relative to the nationwide average property tax rate.

Table 3. Key Macroeconomic Variables by Region and by Period for Option A

STATE	PERIOD 0	1	2	3	4	5	6	7	8	9	10	COMPOUND ANNUAL GROWTH RATE*
Real Personal Income												
Alabama	114	111	112	113	115	118	121	125	130	135	142	2.18%
Florida	111	109	110	112	115	117	121	124	129	134	140	2.37%
Georgia	**117**	**115**	**115**	**117**	**120**	**123**	**128**	**133**	**139**	**147**	**155**	**2.85%**
North Carolina	117	114	115	117	120	123	128	133	139	146	154	2.80%
South Carolina	115	112	112	114	116	119	122	127	132	138	145	2.35%
Tennessee	116	112	112	114	116	119	122	126	131	136	143	2.12%
Rest of U.S.	115	112	113	114	117	120	124	128	134	140	148	2.56%
United States	115	112	113	114	117	120	124	128	134	140	148	2.55%
Real Consumption of Goods												
Alabama	104	99	96	95	94	94	94	95	95	96	97	-0.71%
Florida	102	97	96	95	95	95	96	97	97	98	99	-0.29%
Georgia	**106**	**101**	**99**	**98**	**98**	**98**	**98**	**99**	**100**	**102**	**103**	**-0.29%**
North Carolina	104	99	98	97	97	97	98	99	100	101	103	-0.09%
South Carolina	104	99	97	96	95	95	95	96	96	97	97	-0.68%
Tennessee	106	100	98	97	97	97	98	99	100	101	103	-0.30%
Rest of U.S.	104	100	98	97	96	96	95	95	95	95	95	-0.97%
United States	104	99	98	97	96	96	96	96	96	96	96	-0.86%
Real Labor Supply												
Alabama	87	86	85	85	84	83	82	82	8`	80	80	-0.83%
Florida	90	90	91	91	91	90	89	89	88	87	87	-0.27%
Georgia	**87**	**87**	**87**	**87**	**87**	**87**	**87**	**87**	**87**	**87**	**88**	**0.11%**
North Carolina	86	84	84	83	82	82	81	81	80	80	80	-0.71%
South Carolina	87	85	85	84	84	83	82	82	81	81	81	-0.66%
Tennessee	89	87	86	86	85	84	83	82	81	8`	80	-0.98%
Rest of U.S.	88	87	86	85	85	84	84	84	83	83	84	-0.55%
United States	88	87	86	86	85	84	84	84	83	83	84	-0.53%
Real Demand for Capital												
Alabama	98	97	98	99	101	104	107	110	114	119	125	2.48%
Florida	101	101	104	107	110	112	115	118	122	127	133	2.83%
Georgia	**97**	**96**	**98**	**101**	**104**	**108**	**113**	**118**	**124**	**131**	**140**	**3.66%**
North Carolina	96	95	97	98	101	103	107	111	116	121	128	2.96%
South Carolina	100	97	99	102	105	109	114	119	124	131	121	1.85%
Tennessee	107	106	108	110	113	116	120	124	129	134	141	2.77%
Rest of U.S.	100	99	99	101	103	105	109	1123	118	123	130	2.64%
United States	100	99	100	101	103	106	109	113	118	124	130	2.68%

*Growth rates were calculated using non-rounded values of the macro variables.

Turning now to the effect of the reform on real labor supply, option A causes the decline in real labor supply in the baseline simulation for Georgia to turn positive. More specifically, the compound growth rate in real labor supply changes from -0.46 percent in the baseline to 0.11 percent under option A. Neighboring states also experience increased growth rates in real labor supply, but the changes in percentage terms are significantly smaller than in Georgia, ranging from a 26 percent increase in the negative compound growth rate in Tennessee to a 69 percent increase in Florida.

In contrast, Georgia sees a 4 percent decrease in the compound growth rate in the real demand for capital, which is accompanied by substantially larger decreases in the compound growth rates in the real demand for capital in the neighboring states, ranging from about -11 percent in Tennessee to -17 percent in Florida. In the baseline, the real demand for capital is increasing over the 11-period time horizon in all six state economies. Georgia's proposed tax reform appears to slow this trend throughout the regional economy by decreasing (in absolute value) the negative growth rate in real labor supply and simultaneously decreasing the growth rate in real demand for capital. For example, the compound growth rate of real labor supply (real demand for capital) in the baseline (Table 2) for Alabama is -1.3 percent (2.9 percent). In contrast, the compound growth of real labor supply (real demand for capital) under option A (Table 3) for Alabama is -0.8 percent (2.5 percent).

Using real consumption of goods as a measure for the welfare effects of the reform, the adoption of option A causes the modest growth in real consumption throughout the six-state regional economy in the baseline simulation to become negative. More specifically, real consumption in Georgia decreases from 110 in period 10 of the baseline simulation to 103 in the corresponding period in the option A simulation. As a result, the compound growth rate in real consumption in Georgia decreases from a modest 0.96 percent in the baseline to -0.29 percent in the post-reform economy. Thus, option A creates a substantial reversal of fortune in Georgia. The other five states experience similar reversals, with modest growth in real consumption in the baseline becoming negative as the result of option A.

In sum, the proposed reform has a substantial negative effect in percentage terms on Georgia's economy. Furthermore, the adverse economic consequences of the reform are not isolated to Georgia; rather, they spread throughout the regional economy. We provide a more disaggregated analysis of the distributional consequences of GREAT Plan II when we discuss the results of the MSM.

OPTION B

We next examine the economic effects of Georgia adopting option B, which consists of a further expansion of the sales tax base and an increase in the sales tax rate sufficient to eliminate school property taxes on owner-occupied housing. Table 4 shows the results of this simulation.

Table 4. Key Macroeconomic Variables by State and by Period for Option B

STATE	PERIOD 0	1	2	3	4	5	6	7	8	9	10	COMPOUND ANNUAL GROWTH RATE*
Real Personal Income												
Alabama	114	111	112	113	115	118	121	125	130	135	142	2.17%
Florida	111	109	110	112	115	117	121	124	129	134	140	2.37%
Georgia	**117**	**115**	**115**	**117**	**120**	**123**	**128**	**133**	**139**	**146**	**155**	**2.81%**
North Carolina	117	114	115	117	120	124	128	138	139	146	154	2.79%
South Carolina	115	112	112	114	116	119	122	127	132	138	145	2.34%
Tennessee	116	112	112	114	116	119	122	126	131	136	142	2.10%
Rest of U.S.	115	112	113	114	117	120	124	128	134	140	148	2.55%
United States	115	112	113	114	117	120	124	128	134	140	148	2.54%
Real Consumption of Goods												
Alabama	104	99	96	95	94	94	94	95	95	96	97	-0.72%
Florida	102	97	96	95	95	95	96	97	97	98	99	-0.31%
Georgia	**106**	**101**	**99**	**98**	**98**	**98**	**98**	**99**	**100**	**102**	**103**	**-0.31%**
North Carolina	104	99	98	97	97	97	98	99	100	101	103	-0.11%
South Carolina	104	99	97	96	96	95	95	96	96	97	98	-0.70%
Tennessee	106	100	98	97	97	97	98	99	100	101	103	-0.32%
Rest of U.S.	104	99	98	97	97	96	95	95	95	95	95	-0.99%
United States	104	99	97	97	96	96	96	96	96	96	95	-0.88%
Real Labor Supply												
Alabama	87	86	85	85	84	83	82	82	81	80	80	-0.84%
Florida	90	90	91	92	91	90	90	89	88	87	87	-0.27%
Georgia	**87**	**87**	**87**	**87**	**87**	**90**	**87**	**87**	**87**	**87**	**88**	**0.07%**
North Carolina	86	84	84	83	82	82	81	81	80	80	80	-0.73%
South Carolina	87	85	85	84	84	83	82	82	81	81	81	-0.67%
Tennessee	89	87	86	86	85	84	83	82	81	81	80	-0.99%
Rest of U.S.	88	87	86	85	85	84	84	83	83	83	83	-0.56%
United States	88	87	86	85	85	84	84	84	83	83	83	-0.55%
Real Demand for Capital												
Alabama	98	97	98	99	10	104	107	110	115	119	125	2.48%
Florida	101	101	104	107	110	112	115	118	122	127	133	2.82%
Georgia	**97**	**96**	**98**	**101**	**104**	**108**	**113**	**118**	**124**	**131**	**139**	**3.62%**
North Carolina	96	95	97	98	101	103	107	111	116	121	128	2.95%
South Carolina	101	97	99	102	105	109	114	119	124	131	121	1.83%
Tennessee	107	106	108	110	113	116	120	124	129	134	140	2.76%
Rest of U.S.	100	99	99	101	103	105	109	113	118	123	130	2.63%
United States	100	99	100	101	103	106	109	113	118	124	130	2.67%

*Growth rates were calculated using non-rounded values of the macro variables.

As one might expect, the incremental effect of option B relative to option A is very small, generally on the order of -0.1 or -0.2 percentage points. The change for Georgia in the compound growth rates for real personal income in period 10 between the two reforms is only -0.6 percentage points. The differences in real personal income in period 10 between the two reforms in the remaining states are even smaller, ranging from -0.1 percentage points in Florida to -0.3 percentages points in North Carolina. The economic effects of option B relative to option A are also very small — so small, in fact, that we can treat the two reforms as essentially the same in economic terms and have no need to distinguish between them.

Thus far, our main findings are as follows. First, there are only very small differences in the macroeconomic aggregates between options A and B. Second, both options have relatively large effects in percentage terms on the macroeconomic aggregates relative to the baseline. Third, and perhaps most importantly, the simulations indicate that the two reforms have largely deleterious effects on the two macroeconomic aggregates that are most likely to have the greatest effect on individual well-being: the growth rates of real personal income and of real consumption of goods.

The CGE model is complex and thus explaining its results is difficult. But, here is some explanation. The policies we simulate involve a decrease in the property tax rate on housing and an increase in sales taxes, such that there is no change in total tax revenue. Because housing is capital intensive relative to other industries, the effect of the policy is equivalent to a policy that reduces the tax on capital in the housing sector and increases the tax on commodities in the other sectors. We consider the effects in three stages. First, we consider the case of just Georgia. Second, we change the context to allow interstate mobility of capital and labor. Third, we allow for dynamic effects and thus allow for growth in the capital stock.

In a static, closed economy the tax reduction will increase the demand for capital and labor in housing while the increased tax on the non-housing sector will reduce the demand for capital and labor. Because of the difference in the relative capital intensity, the effect of the tax policy will also increase the rental-wage ratio and shift capital and labor from the non-housing sector to the housing sector.

Now, consider what happens if we allow for interstate mobility. Given the increase in the rental-wage ratio, capital will flow into the state and labor will leave. This will have the effect of increasing the capital-labor ratio in the state and reducing the rental-wage ratio relative to the closed economy equilibrium. However, relative to the pre-tax policy equilibrium, the rental-wage ratio and the capital-labor ratio in the housing sector will be larger. The result of these effects could be a large decrease in the quantity of consumption goods and a small increase in the quantity of housing. Our results suggest that such a change will reduce the welfare of consumers, that is, they would have preferred the original tax structure, with less housing and more consumer goods.

If we now allow our static, open economy model to become dynamic, the results become increasingly difficult to evaluate analytically. Recall that our model assumes that investors make decisions regarding domestic investment based upon current interest rates and future rates of returns to capital. As returns to capital change, based upon perfectly mobile capital flows between states as well as labor migration, so will rates of investment and rates of growth change. Additionally, we are replacing a lowered capital tax in the capital intensive housing sector with a consumption tax in the relatively labor intensive part of the economy. Thus, we are reducing one tax distortion while increasing another. We do not know in advance which tax change will have a greater positive (or negative) impact on rates of capital formation, and hence upon income growth.

The Microsimulation Model

To explore the distributional effects of GREAT Plan II, we construct an MSM for the Georgia economy. We link the MSM in a top-down fashion to the aggregate results from the CGE model. Because the economic consequences of options A and B are so similar, we use the MSM to model the distributional effects of option B relative to the baseline. We choose option B for this simulation because it incorporates all of the reforms included in option A as well as some further reforms, making it the more comprehensive of the two reforms.

As explained in greater detail below, to establish a connection between the CGE model and the information available in micro databases we use a top-down approach from the CGE model to the MSM using representative household groups (RHG).[15] In this approach, a traditional CGE model with representative households is used to simulate a policy reform, producing changes in key macroeconomic variables (consumption, income, prices, aggregate consumption by commodity group or sector, etc.). Second, a dataset consisting of detailed household information from a sample of Georgia residents is used to construct representative households for each income category in the MSM. In our case, we construct 10 income deciles, which is the usual practice. Finally, the changes estimated by the CGE model are imposed on each representative household for the 10 income deciles.

The advantage of this approach is its simplicity. As mentioned by Lofgren, Robinson and El-Said (2003), the top-down RHG approach requires fewer resources in terms of data, time and skill compared to alternative approaches that are not based on RHG.[16] The top-down approach has three disadvantages. First, we assume a representative agent for each of the income deciles. As a result, we do not capture the full richness of real consumers in each decile, who have different tastes for goods and services and different endowments of capital and labor. Second, we strive to make the consumption of final goods and services in the MSM add up to the aggregate total of final goods and services for each commodity group. However, the two models are not entirely consistent with one another. Third, the fact that demand for final goods and services in the MSM does not equal the supply of final goods and services for each commodity group in the CGE should lead to feedback effects in the CGE model. For example, suppose that the demand for manufactured goods in the MSM exceeds the supply of manufactured goods in the CGE model. The excess demand for manufactured goods should cause the market price of manufactured goods in the CGE to increase, which would increase the quantity of manufactured goods supplied and

[15] See Feltenstein et al. (2014) for a more extensive discussion of linking MSMs to CGE models. Agénor et al. (2003) also describe a top-down RHG procedure.

[16] Some prior studies have employed a bottom-up RHG approach. This approach is also described in Feltenstein et al. (2014).

decrease the quantity of manufactured goods demanded. Furthermore, the change in the price of manufactured goods relative to the prices of all other goods in the economy should affect demand and quantity supplied for these other goods. However, the CGE model does not take these feedback or general equilibrium effects into account.

For the MSM, we use data from the 2011 American Community Survey's Public Use Microdata Sample (PUMS) to form 10 income groups with an equal number of households.[17] Then, we construct a representative household for each of the income deciles using mean values of the major attributes of the households in a given income group. For each income decile, we use U.S. Census Bureau data to calculate income by source, housing value, rent paid and employment by industry. We specify the share of households within each income decile that are homeowners and renters. We use Census data to estimate the share of income coming from the three sources modeled in the CGE: labor income, capital income and government transfers. We calculate the percentage of individuals within each income decile who are employed in each of the 15 industry sectors. We assume that the wage rate in each industry is equal to one, and we further assume that a unit of labor is equally productive in each sector of the economy. We assume that the labor supply of any worker is fixed, i.e., we do not allow for a labor-leisure choice. From the Bureau of Labor Statistics' Consumer Expenditure Survey (CES), we calculate expenditures by service and product for the representative household in each of the 10 income deciles.

The CGE model produces aggregate labor income, aggregate capital and aggregate government transfer income in the baseline and in the counterfactual economy, which assumes Georgia has adopted option B. In the baseline simulation (Table 2), labor income in Georgia is increasing as a share of total personal income over the 11 time periods in the model from approximately 35 percent in period zero to about 42 percent in period 10. In contrast, capital income is decreasing as a share of personal income over the same period, from about 37 percent to approximately 30 percent in periods zero and 10, respectively. In our model, personal income consists of wage income, capital income and government transfers less indirect business taxes (i.e., sales taxes, import duties, special excise taxes and property taxes). The share of government transfers in total personal income trends upward slightly by about two percentage points over this period. Interestingly, there is a sharp reduction in the share of personal income from capital and a more or less offsetting increase in the share of transfer income under option B. The share of labor income in personal income under option B trends slowly upward by about two percentage points.

We use data from the Census to estimate the shares of total labor, capital and transfer income received by each income class. Table 5 reports these shares. In a necessary abstraction from reality, we assume that these shares stay the same in both the baseline and counterfactual simulations.

[17] PUMS files are a set of untabulated records about individual people or housing units. The U.S. Census Bureau produces the PUMS files so that data users can create custom tables that are not available through pretabulated (or summary) ACS data products. The following website provides further information about PUMS data: census.gov/programs-surveys/acs/technical-documentation/pums.html.

Table 5. Wage, Transfer, and Capital Income Shares by Income Class

INCOME CLASS	SHARE OF THE TOTAL WAGE BILL BY INCOME CLASS (PERCENT)	SHARE OF TOTAL TRANSFER INCOME BY INCOME CLASS (PERCENT)	SHARE OF TOTAL CAPITAL INCOME BY INCOME CLASS (PERCENT)
1	0.4	3.2	0.4
2	1.3	7.8	1.5
3	2.7	8.5	2.4
4	4.3	9.0	3.5
5	5.9	10.3	4.4
6	7.9	10.7	5.4
7	10.3	11.3	6.8
8	13.5	11.8	8.9
9	18.8	12.0	11.5
10	34.9	15.5	55.2

Source: Authors' calculations using data from the U.S. Census Bureau

The CGE model also specifies relative prices for each industry group in both the baseline and the counterfactual simulations. Option B causes relative prices to change, which results in changes to aggregate demand and supply for each of the 15 industry groups in the CGE model. We use the transition matrix from Fullerton and Rogers (1993) to transform output by industry from the CGE model to goods and services for the MSM. We use data on aggregate personal income and consumption to calculate an average propensity to consume (APC), which is the ratio of total consumption divided by personal income by period for Georgia in the baseline and in the counterfactual simulations. Although the APC for Georgia changes in the two simulated economies, in a second abstraction, we assume that the APC is the same for each income class in the MSM. Finally, we use data from the CES to calculate expenditure shares by income class for each of the 15 commodity groups in the CGE model. Then, we use the transition matrix from Fullerton and Rogers (1993) to transform output by industry from the CGE model to final consumption goods and services for the MSM.

Reducing property taxes on owner-occupied housing changes the relative prices for owning versus renting. To measure the effect of this change on tenure decision, we use an elasticity estimate from Rosen and Rosen (1980).[18] Rosen and Rosen estimate the elasticity of housing tenure with respect to the relative price of owning versus renting. We adjust their estimate to account for the difference between how we and they measure housing prices.

[18] The cross-price elasticity of housing tenure choice describes the percentage change in the demand for owner-occupied housing for a percentage change in the price of rental housing. Suppose, for example, that this elasticity is equal to 0.5. Then, a 10 percent increase in the price of rental housing would result in a 5 percent (= 10 × 0.5) increase in the demand for owner-occupied housing.

Using the expenditure and income shares for each decile, we use aggregate expenditures and income from the CGE model for the baseline and counterfactual simulations to estimate total consumption for the representative household in each decile in both simulations. In sum, aggregate personal income and aggregate consumption of final goods and services by commodity group produced by the CGE model in the baseline and counterfactual simulations serve as adding-up constraints in the MSM. In other words, suppose aggregate personal income (aggregate consumption) in the baseline simulation of Georgia from the CGE model is equal to 100; then, aggregate personal income (aggregate consumption) in the MSM should equal 100, as should the counterfactual simulation.

Results from the Microsimulation Model

As previously discussed, options A and B result in the real consumption of goods and services in period 10, decreasing by about a 6 percent relative to the baseline estimate. Because utility is monotonic in consumption and the differences in Cobb-Douglas exponents by income class are relatively small, we believe that discussing the distributional consequences of GREAT PLAN II in terms of consumption rather than utility is more straightforward than the alternative. We use the MSM to construct consumption shares by income decile to provide a more detailed picture of the distributional consequences of GREAT Plan II. Because options A and B are so similar, we focus on the distributional consequences of option B. Table 6 presents the consumption shares by income deciles and for periods zero, five and 10 in the baseline and counterfactual simulations.

The left panel of Table 6, labeled baseline, shows that income class 10 is responsible for a much larger share of aggregate consumption than the other income classes. For example, the sum of the consumption shares of income classes one through seven is approximately 37.3 percent, which is essentially equal to the consumption share of income class 10 alone. The data in Table 6 also indicates that the consumption shares of the income classes in the baseline simulation are fairly stable over time.

Turning now to the counterfactual simulation, we see that GREAT Plan II has virtually no effect on the consumption shares by income class. For example, the consumption of income class one in period 10 under option B is approximately 0.8 percent greater than the consumption share of the corresponding income class and period in the baseline simulation. In fact, the consumption shares of income classes one through nine are slightly greater in period 10 under option B compared to the corresponding period in the baseline. In contrast, the consumption share of income class 10 in period 10 is slightly smaller in option B compared to that in the baseline. For all practical purposes, GREAT Plan II has no effect on the distribution of consumption by income class, but the reform does have a substantial negative impact on the growth rates in real personal income and real consumption of goods and services.

Table 6. The Effect of GREAT Plan II on the Share of Total Consumption by Income Class and by Period

INCOME CLASS	BASELINE			OPTION B		
	PERIOD					
	0	5	10	0	5	10
1	1.16	1.15	1.13	1.27	1.20	1.14
2	3.15	3.11	3.05	3.39	3.23	3.07
3	4.17	4.15	4.13	4.42	4.28	4.15
4	5.28	5.28	5.28	5.51	5.41	5.30
5	6.54	6.57	6.59	6.80	6.71	6.62
6	7.71	7.79	7.86	7.96	7.94	7.89
7	9.26	9.38	9.49	9.49	9.52	9.53
8	11.32	11.50	11.66	11.51	11.62	11.70
9	14.21	14.51	14.79	14.35	14.62	14.85
10	37.20	36.57	36.04	35.31	35.46	35.75

Summary and Conclusions

Over the past decade, there have been calls in several states to significantly reduce property taxes. In Georgia, a proposal was advanced that if enacted would have eliminated property taxes on homesteaded property for school purposes, with the lost revenue being replaced with an expansion of the sales tax base to include services and some products that are currently exempt. We analyze the economic effects of this proposal using a CGE model. We then take the results from the CGE model and use them in an MSM to explore the effects of the proposal in more detail.

We consider two proposals. The first proposal consists of adding services to Georgia’s sales tax base and a revenue-neutral decrease in the property tax rate on owner-occupied housing. The second proposal further expands the sales tax base and increases the sales tax rate by an amount sufficient to eliminate school property taxes on homesteaded property. We find little difference in the outcomes of the two proposals. The proposed reforms, if enacted, would have a substantial negative effect in percentage terms on Georgia’s economy. Furthermore, the adverse economic consequences of the reforms are not isolated to Georgia but rather spread throughout the regional economy.

To provide more details regarding the distributional effects of GREAT Plan II, we construct an MSM that we link to the results from the CGE model for the Georgia economy. For all practical purposes, GREAT Plan II has no effect on the distribution of consumption shares by income class. However, the CGE shows that the reform would have a substantial negative impact on the growth rates in real personal income and real consumption of goods and services. Consequently, we conclude that everyone in Georgia would be worse-off after the reform, irrespective of their income class.

We would be remiss if we did not point out some of the limitations of the analysis. The industry data are aggregated, which masks some of the distortions caused by the tax policy. Production is defined by industry and not by product line. This results in a lack of precision in measuring the sales tax base. We do not include land as a separate input, which is an important factor in housing. Given that land is immobile, the model probably overstates the effect on capital from reducing property taxes. Finally, while the assumptions that we make for the dynamics are economically justifiable, we have no way of determining whether our specification of the dynamics correspond to reality.

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