Carl Vinson
Institute of Government
UNIVERSITY OF GEORGIA

Tax Incentive Evaluation

Georgia's Manufacturing Investment Tax Credit

Jessie Justice
Adedotun Seyingbo
Tommie Shepherd

November 2025

Tax Incentive Evaluation: Georgia's Manufacturing Investment Tax Credit

Prepared by:
The University of Georgia
Carl Vinson Institute of Government

For:
Georgia Department of Audits and Accounts

Date of Delivery:
November 2025

Authors:
Jessie Justice
Adedotun Seyingbo
Tommie Shepherd

Carl Vinson Institute of Government
University of Georgia
201 North Milledge Avenue
Athens, Georgia 30602

Executive Summary

This study is a review of Georgia's manufacturing investment tax credit on manufacturing income conducted in accordance with the Tax Expenditures Transparency Act of 2024, also known as Senate Bill 366. The research team projected forgone state tax revenue attributable to the credit and compared the estimated ROI of the current tax situation with the counterfactual scenario: what if Georgia collected income taxes on manufacturer spending as defined by NAICS sector 31-33.

NAICS sector 31-33 includes a broad range of manufacturing categories, including the manufacturing of food products, paper products, and industrial equipment. Manufacturing related to chemical treatments, clothing, and plastics is also included in this sector. Consequently, the analysis applies to all manufacturing related spending in the state.

The research team found that many states offer income tax related incentives to manufacturers for investment purposes. However, these incentives vary greatly in both accessibility and structure, with many states emphasizing larger manufacturers. Georgia's credit is significantly more accessible to smaller firms than credits offered by other states.

The estimated ROI of Georgia's manufacturing investment tax credit is -0.91 between 2025 and 2030. Intuitively, this result implies that, for every $1 in tax credited in 2024, $0.09 in value-added impact accrues to the state's economy. The ROI of the tax credit is calculated based on net forgone tax revenue, that is, the total or gross amount of forgone revenue to the state less any additional taxes collected as a result of the credit.

In the case of the alternate use of forgone revenue, institute researchers modeled two impacts: the impact of the state of Georgia collecting and spending tax revenue from manufacturing spending and the impact of the reduction in manufacturing output due to reduced demand for new equipment and construction as the price of goods increases. Under the alternate scenario, for every $1 in tax on manufacturing spending collected and spent by the state, $1.32 in value-added impact accrues to the state's economy.

The Institute of Government researchers note that there were many data limitations in this analysis. These data limitations include lack of firm-level spending data, whether a project was classified as a defense or environmentally beneficial project and, a lack of data related to jobs created by firms who received the tax credit.

Background

This study is a review of Georgia's manufacturing investment tax credit (GMITC) in accordance with the Tax Expenditures Transparency Act of 2024, also known as Senate Bill 366. SB366, passed during the 2024 legislative session, expands on the requirements of its predecessor, SB6. SB6 required the calculation of forgone tax revenue, the economic impact of the tax incentive on the state economy, and the overall return on investment (ROI) of the credit or exemption. SB366 expands this list to include an assessment of the credit's efficiency, ancillary impacts, the theoretical impact of modifying or terminating the credit, and recommendations for improving the ROI. This report is one of four tax incentive evaluations produced under contract with the Georgia Department of Audits and Accounts by the University of Georgia's Carl Vinson Institute of Government.

HISTORY & PURPOSE

The Georgia manufacturing investment tax credit (GMITC) was introduced in 1994 to stimulate investment in manufacturing and telecommunications sectors and support economic development in the state. Specifically, the legislation initially required manufacturers or telecommunications firms to be operating for three years or more and to meet a minimum investment threshold of $50,000 with a specified carryover provision of 10 years. The tiered structure of the credit was added in 2008 to further incentivize investment in more economically disadvantaged counties. The tiered system allows firms to earn credits of between 1% and 5% of a qualified investment depending on the geographic location and an additional 3% bonus for environmentally beneficial investments. More recently, the minimum investment threshold was raised to $100,000 in 2020 and the carryover provision was reduced to five years in 2025.

HOW IT WORKS

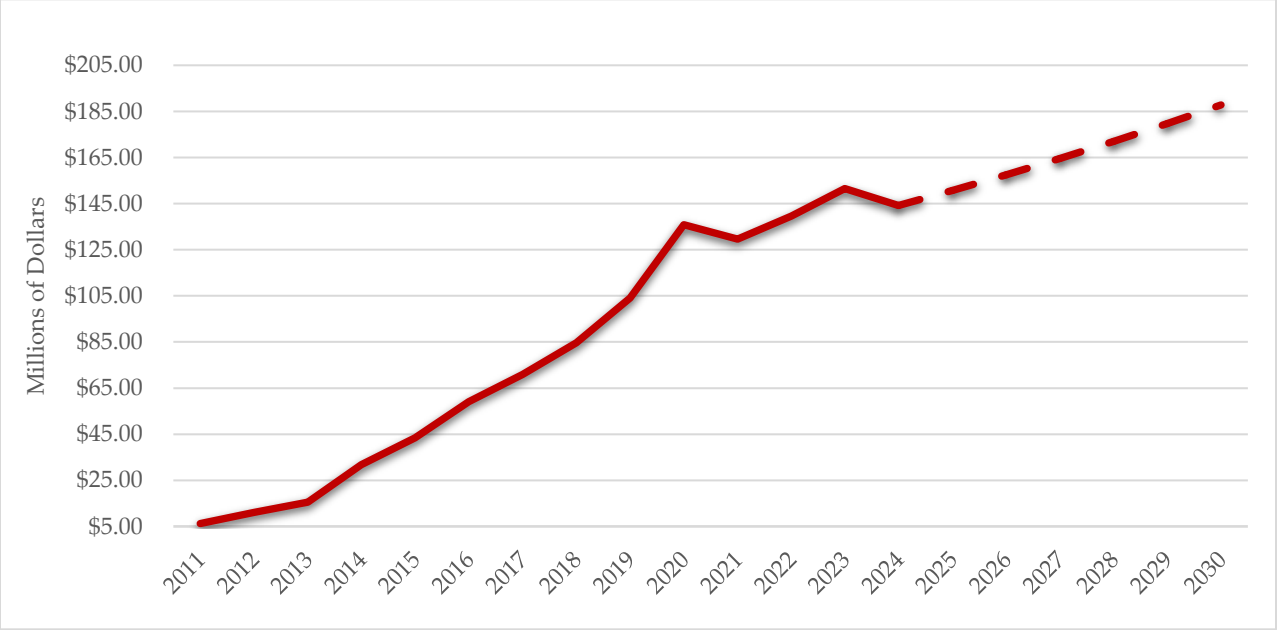
In the most recent revision to the GMITC a firm must have been operating in the state for at least three years and have met a minimum investment threshold of $100,000 in "qualified investment property or expenses" to qualify for the credit towards offsetting income taxes. These categories broadly include land acquisition, improvements, buildings, and the purchase of machinery and equipment to be used in the manufacturing or telecommunications facility. Specifically, this property must be used for the construction of an additional manufacturing or telecommunications facility or the expansion of an existing manufacturing or telecommunication facility located in Georgia. Additional provisions exist for projects in rural counties and for projects in the aerospace and defense industries. For rural counties – mostly tier one and tier two counties – the modified law allows earned credits of more than 50% of corporate income tax to be offset with payroll withholding tax, up to $1,000,000/year (capped statewide at $10,000,000). For aerospace and defense industries, the GMITC provides an increased credit cap for qualifying projects that meet a job creation threshold of at least 1,000 new full-time jobs and minimum investment threshold of $500 million. In addition, the tier

structure applies, with tier three and four counties being eligible for a 1% credit, tier two counties being eligible for a 3% credit and, tier one counties being eligible for a 5% credit, and all county tiers eligible for a 3% credit bonus if a project is environmentally beneficial or recycling related. A carryover provision of five years applies to all credit approvals.

UTILIZATION

Utilization of the GMITC can be quantified using data acquired from the Georgia Department of Revenue (GDOR). The credit amount approved in Georgia ranged from $6.2 million in 2011 to $132.8 million in 2025, with the largest value occurring in 2023 (Figure 1). We note a strong upward trend in utilization in the early 2010s abated in the early 2020s following the COVID-19 pandemic. In general, utilization has remained largely steady over the past five years and is projected to remain steady from 2025 to 2030.

Figure 1. Historical and Projected Utilization of Georgia Manufacturing Investment Tax Credit, 2011-2030



Source: Institute of Government projections based on Georgia Department of Revenue Data.

OTHER STATES

Many states, including Georgia, offer investment tax incentives to offset corporate income tax burden for qualifying projects. Institute researchers identified a few notable examples of states that offer investment tax incentives: South Carolina, Alabama, Tennessee, Kentucky, Mississippi, Rhode Island, and Maine.

Of the select programs reviewed, Georgia's manufacturing investment tax credit is the most structured, using a tiered system that awards between 1% and 8% of investment depending on the economic status of the county and the nature of the project. Tennessee and Kentucky offer substantial flexibility—Kentucky's reinvestment credit can offset up to 100% of corporate income tax liability, while Tennessee allows credits of up to 50–100% of investment for large-scale or brownfield projects. South Carolina offers credits for both new production equipment and building rehabilitation, while also allowing credits against property and license taxes.

Alabama and Mississippi focus on capital investment thresholds, with Mississippi requiring at least $1 million in investment and offering a 5% credit. Georgia's low $100,000 investment threshold makes its manufacturing tax credit program more accessible to small and medium-sized business compared to similar programs in Alabama and Mississippi, which focus on larger-scale investments through higher thresholds.

Transferability of manufacturing-related tax credits varies widely across states. Georgia's credit, for example, can be transferred to a successor entity in the event of a merger or acquisition, while Alabama allows transfers at up to 85 % of face value for governor approved projects. Mississippi's credit may be transferred to partners or shareholders in passthrough entities, and West Virginia permits transfers to a successor business. In contrast, Tennessee does not allow transfers except under certain succession -conditions; Maine's paper-mill credit is tied to a single qualifying taxpayer, and Rhode Island's ITC is nontransferable. South Carolina and Kentucky do not explicitly address transferability, whereas Virginia allocates its -jobcreation- credit among owners of passthrough entities but does not provide- a resale mechanism[1].

Deductibility of expenses associated with the credit also differs by state. Georgia prohibits "double counting," meaning taxpayers cannot depreciate investment property and claim the credit simultaneously[2]. Mississippi and West Virginia require businesses to add back expenses used to calculate the credit when determining taxable income[3]. In Tennessee[4] and Alabama, the credit applies directly against franchise, excise, or income tax liability without explicit addback provisions, while South Carolina's revitalization credit can offset real property- tax without mention of addbacks. Maine's[5] paper-mill credit is refundable and essentially functions as a cash payment rather than a deduction, and Rhode Island's ITC may reduce only a portion of tax liability depending on whether the credit rate is 4 % or 10 %.

[1] https://prd-tax.virginiainteractive.org/sites/default/files/taxforms/early-release/2024-individual/instructions/draft-2024-sch-cr-instructions-early-release.pdf
[2] https://www.law.cornell.edu/regulations/georgia/Ga-Comp-R-Regs-R-560-7-8-.37#:~:text=1,tax%20credits%20will%20be%20claimed
[3] https://tax.wv.gov/documents/taxforms/mitca.pdf#:~:text=By%20Law%2C%20no%20credit%20may,fi%20led%20annually%20no%20later
[4] https://edcncctn.com/wp-content/pdf/Manufacturing_Incentives.pdf#:~:text=enterprise5%20within%20twelve%20,years%20in%20order%20to
[5] https://legislature.maine.gov/doc/11279#:~:text=refundable%20income%20tax%20credit%20of,Department%20of%20Economic%20and%20Community

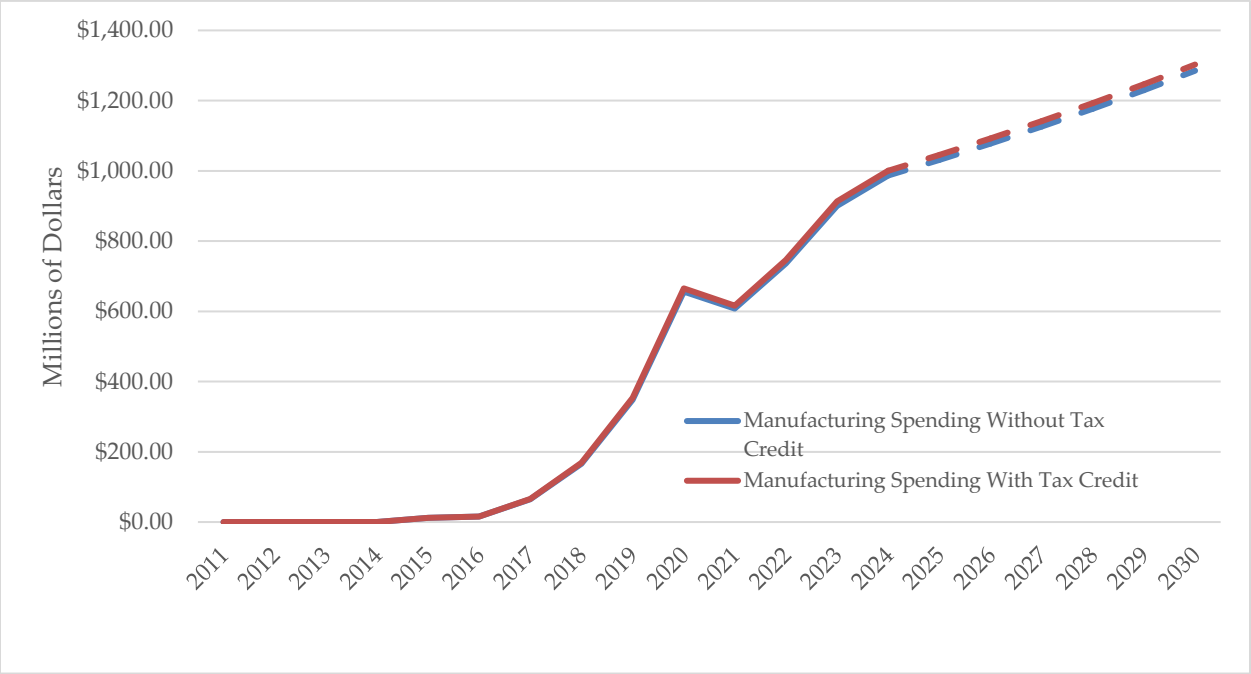
Economic Impact

This section presents the economic activity attributed to GMITC and the analysis begins with estimates of gross economic activity generated by the tax credit projected from 2025 to 2030. Next, this section presents calculations of net economic activity generated by the tax credit and calculates the return on investment for the tax credit. In the following section, these results are compared with the economic activity that would have been generated under an alternate-use scenario in which the state does not offer the manufacturing investment tax credit and spends that revenue in a manner similar to all other tax revenues. These calculations allow for a direct comparison between the return on investment of the GMITC for manufacturing spending (NAICS codes 31-33) on new construction and equipment and the counterfactual situation in which the state is assumed not to offer the manufacturing investment tax credit. For more information on the methodology and IMPLAN, see Appendix B.

GROSS ECONOMIC ACTIVITY

Institute researchers projected new manufacturing sector spending on equipment and construction with and without the investment tax credit from 2025 through 2030 based on the historical trend in new manufacturing spending as calculated using percentages for new equipment and construction as shares of manufacturing spending in Georgia from the US Census Annual Capital Expenditure Survey (ACES) and Georgia Department of Revenue tax credit data (Figure 2). Manufacturing spending estimates were adjusted to exclude land transactions and used building purchases which do not create economic impact. Results are displayed in Table 1. Under the current scenario in which the tax credit exists, Institute of Government researchers estimated that manufacturing spending on new equipment and construction generated $1 billion in revenue in 2024, increasing to $1.3 billion in 2030. Total manufacturing spending on new equipment and construction with the tax credit amounted to $8.02 billion over the seven-year period from 2024 to 2030.

Figure 2. Historical and Projected Qualified Manufacturing Spending on New Construction and Equipment with and without GMITC, 2011-2030



Source: Institute of Government Projections based on US Census Annual Capital Expenditure Survey and Georgia Department of Revenue data.

To project manufacturing spending without the tax credit, projected spending under the current "tax credit" scenario must be reduced to account for the higher income tax burden resulting from loss of the tax credit. This estimated reduction is accounted for by the application of a price elasticity of demand for manufacturing spending on new equipment and construction. Price elasticity of demand is a measure of the change in demand for goods or services in response to a change in price. Institute researchers utilized –0.5% for the price elasticity of demand for new manufacturing equipment and construction spending based on a review of academic literature on the demand for residential and commercial construction and econometric models developed internally. For more detailed information on elasticity, see Appendix C. Based on the tier system of the tax credit, spending in different counties would be subject to increases in cost ranging from 1% to 5% in the absence of the credit. This would amount to a reduction in the demand for manufacturing spending on new equipment and construction by 1.34% on average across county tiers and accounting for differences in tier contribution shares to overall spending. Under this counterfactual scenario in which the manufacturing investment tax credit does not exist, manufacturing spending on new equipment and construction would generate $986.9 million in revenue in 2024, increasing to $1.29 billion by

2030. The lost spending between the current (tax exempt) and counterfactual (taxed) scenarios increases from $13.45 million in 2024 to $17.52 million by 2030. Over a seven-year period, the total reduction in manufacturing output as a result of the increased income tax on manufacturing spending would be $107.88 million.

Table 1. Projected manufacturing spending on new equipment and construction, modeled with and without tax credit, 2024-2030

Year	Value of Manufacturing Spending on New Equipment and Construction w/Credit	Value of Manufacturing Spending on New Equipment and Construction w/o Credit	Increase in Value of Manufacturing Spending on New Equipment and Construction	% Change Due to Credit
2024	$1,000,353,764	$986,900,434	$13,453,330	1.34%
2025	$1,045,369,684	$1,031,310,954	$14,058,730	1.34%
2026	$1,092,411,320	$1,077,719,947	$14,691,373	1.34%
2027	$1,141,569,829	$1,126,217,344	$15,352,485	1.34%
2028	$1,192,940,471	$1,176,897,125	$16,043,347	1.34%
2029	$1,246,622,793	$1,229,857,495	$16,765,297	1.34%
2030	$1,302,720,818	$1,285,201,083	$17,519,736	1.34%
Total	$8,021,988,679	$7,914,104,381	$107,884,298	1.34%

Source: Institute of Government Projections based on US Census Annual Capital Expenditure Survey and Georgia Department of Revenue data.

The research team projected foregone state revenue and modeled the estimated economic impact to the state economy of the tax credit using IMPLAN[6]. Results are shown in Table 2. Foregone state revenue ranges from $143.76 million in 2024 to $187.25 million in 2030. Increased spending on new manufacturing construction and equipment as a result of the tax credit is estimated to add $13.46 million in value-added economic activity to the state's economy in 2024, growing to $17.53 million by 2030.

The economic ROI of the credit is calculated as the return to net foregone tax revenue (i.e., gross foregone revenue less additional taxes collected due to an expanded construction sector) from the value-added impact of the credit. Projected ROI over the study period is -0.91.

[6] IMPLAN® model, 2021 Data, using inputs provided by the user and IMPLAN Group LLC, IMPLAN System (data and software), 16905 Northcross Dr., Suite 120, Huntersville, NC 28078 www.IMPLAN.com

Table 2. Forgone revenue due to GMITC and value-added economic impact, 2024-2030

	2024	2025	2026	2027
Net Forgone State Rev.	$143,759,806	$150,258,947	$157,020,599	$164,086,527
Credit Value-Added	$13,458,157	$14,063,774	$14,696,644	$15,357,993
ROI of Credit+	-0.91	-0.91	-0.91	-0.91

	2028	2029	2030
Net Forgone State Rev.	$171,470,421	$179,186,590	$187,249,986
Credit Value-Added	$16,049,102	$16,771,312	$17,526,021
ROI of Credit[1]	-0.91	-0.91	-0.91

Source: Institute of Government Projections based on US Census Annual Capital Expenditure Survey and Georgia Department of Revenue data and IMPLAN 2021.

+ROI of the tax credit is calculated based on Net Forgone State Revenue (e.g. gross forgone revenue less additional state taxes collected).

Table 3 shows the increase in employment, labor income, value added to the state economy, and manufacturing output for the sample year 2024. The tax credit is estimated to support an additional 64 manufacturing related jobs, 21 indirect jobs in industries that supply inputs to the manufacturing sector, and 91 induced jobs as workers in those direct and indirect jobs spend their earnings on additional goods and services. Labor income figures in Table 3 represent the additional salary dollars associated with the jobs, while value-added represents the additional value added to the state economy as a result of increased manufacturing activity. Output figures capture the total amount of additional output attributable to the tax credit.

Table 3. Economic impact detail of the GMITC for 2024

IMPACT	EMPLOYMENT	LABOR INCOME	VALUE ADDED	OUTPUT
DIRECT	64	$4,419,418	$7,145,492	$13,636,213
INDIRECT	21	$1,708,209	$3,072,018	$5,724,529
INDUCED	91	$1,633,105	$3,240,647	$5,231,898
TOTAL	176	$7,760,731	$13,458,157	$24,592,640

Source: Institute of Government Projections based on US Census Annual Capital Expenditure Survey and Georgia Department of Revenue data.

ALTERNATE USE OF FORGONE REVENUE

As part of this tax incentive evaluation, the research team was tasked with calculating how much economic activity would be generated if the credit did not exist and the tax on manufacturing spending was collected and spent by the state of Georgia. To compare the ROI of the counterfactual scenario to the current scenario, the research team modeled the economic impact of the alternate use of forgone revenue. The alternate use of forgone revenue assumes that the state collects the income tax on manufacturing spending and spends that revenue on goods and services that it typically provides to taxpayers. Forgone revenue is modeled in IMPLAN as the direct output of state spending.

Table 4 displays the economic impact of the state collecting and spending $144.21 million in taxes collected on manufacturing spending in 2024. According to IMPLAN estimates, $144.21 million in taxes on manufacturing spending would support the equivalent of 2,400 state jobs, 199 indirect jobs, and 555 induced jobs for a total of 3,154 jobs. For each additional $1 million in state spending, 16 state jobs are created. Each additional $1 million in state spending also supports one indirect job and three induced jobs. Based on IMPLAN estimates, $144.21 million in state spending would add $189.95 million in value-added impact to Georgia's GDP. These results should be interpreted with extreme caution due to the fact that IMPLAN's multiplier-based algorithms simply apply percentages of a state salary budget to all additional state revenues. The correct interpretation should be that the tax would generate sufficient revenue to support the equivalent of 2,400 state jobs. A large percentage of indirect and induced jobs attributed to the increased tax revenue would be offset by job losses attributed to reduced manufacturing sector spending. The net effect of Tables 3 and 4 would amount to a net gain of 2,336 state jobs, 178 indirect jobs, and 464 induced jobs.

Table 4. Economic impact of alternate use of forgone revenue, 2024

IMPACT	EMPLOYMENT	LABOR INCOME	VALUE ADDED	OUTPUT
DIRECT	2,400	$107,977,596	$106,273,355	$144,214,725
INDIRECT	199	$12,092,926	$21,295,023	$39,498,222
INDUCED	555	$31,501,579	$62,380,323	$100,723,083
TOTAL	3,154	$151,572,101	$189,948,701	$284,436,030

Source: Institute of Government Projections and IMPLAN 2022. Note: Refer to prior paragraph for guidance on interpretation of results in Table 4.

NET ECONOMIC ACTIVITY

Under the counterfactual scenario, state income tax was calculated on projected manufacturing spending. Forgone state revenue is estimated at $144.21 million in 2024, increasing to $187.85 million in 2030 (Table 5). Over the six-year period from 2024 to 2030, total forgone state revenue amounts to $1.16 billion. Table 5 also displays the value-added economic impact (GDP) of new manufacturing spending attributable to the credit, which ranges from $13.46 million in 2024 to $17.53 million in 2030. The estimated ROI of Georgia's manufacturing investment tax credit (Table 5) is -0.91. In the counterfactual scenario, where the state collects and spends tax revenue on manufacturing spending, the value-added impact ranges from $189.95 million in 2024 to $247.36 million in 2030. The ROI of the counterfactual scenario is 0.317 over the projected time period.

Table 5. Forgone state revenue due to the manufacturing investment tax credit and value-added economic impact of alternate use scenario, 2024-2030

	2024	2025	2026	2027
Gross Forgone State Rev.	$144,214,725	$150,704,388	$157,486,085	$164,572,959
Net Forgone State Rev.	$143,759,806	$150,258,947	$157,020,599	$164,086,527
Credit Value-Added	$13,458,157	$14,063,774	$14,696,644	$15,357,993
ROI of Credit+	-0.91	-0.91	-0.91	-0.91
Alt. Use Value-Added	$189,948,701	$198,496,393	$207,428,730	$216,763,023
ROI of Alternate Use*	0.317	0.317	0.317	0.317
	2028	**2029**	**2030**	
Gross Forgone State Rev.	$171,978,742	$179,717,786	$187,805,086	
Net Forgone State Rev.	$171,470,421	$179,186,590	$187,249,986	
Credit Value-Added	$16,049,102	$16,771,312	$17,526,021	
ROI of Credit+	-0.91	-0.91	-0.91	
Alt. Use Value-Added	$226,517,359	$236,710,641	$247,362,619	
ROI of Alternate Use*	0.317	0.317	0.317	

Source: Institute of Government Projections and IMPLAN 2022.

+ROI of the tax credit is calculated based on Net Forgone State Revenue (e.g. gross forgone revenue less additional state taxes collected).

*ROI of the alternate use is calculated based on Gross Forgone State Revenue

Fiscal Impact

SB366 tax incentive evaluations are required to calculate the fiscal impact of credits and exemptions as well as the economic impact. The fiscal impact of a tax credit sums forgone state revenue, increased state tax collections, and any cost to the state of administering the credit. The research team modeled additional state revenue generated by the credit using IMPLAN.

The difference in state tax between the current (with credit) and counterfactual (without credit) scenarios is displayed in Table 6. Increased state tax collections due to the credit range from $454.92 thousand in 2024 to $555.1 thousand in 2030 for a total increase of $3.45 million over the seven-year period. The fiscal impact of Georgia's tax credit for manufacturing investment ranges from -$144 million in 2024 to -$187 million in 2030. Fiscal impact of the credit over the seven-year period from 2024 to 2030 totaled to -$1.15 billion in state revenue.

Table 6. Forgone state revenue due to the tax credit for manufacturing investment, increased state tax collections due to the credit, and fiscal impact of the credit, 2024-2030

YEAR	FORGONE STATE REVENUE	INCREASED STATE TAX COLLECTIONS	FISCAL IMPACT
2024	$(144,214,725)	$454,919	$(143,759,806)
2025	$(150,704,388)	$445,441	$(150,258,947)
2026	$(157,486,085)	$465,486	$(157,020,599)
2027	$(164,572,959)	$486,432	$(164,086,527)
2028	$(171,978,742)	$508,321	$(171,470,421)
2029	$(179,717,786)	$531,196	$(179,186,590)
2030	$(187,805,086)	$555,100	$(187,249,986)
TOTAL	$(1,156,479,771)	$3,446,895	$(1,153,032,876)

Source: Institute of Government Projections based on US Census Annual Capital Expenditure Survey and Georgia Department of Revenue data.

Ancillary Impacts and Recommendations

Although the intent of offering an income tax credit for manufacturing investment is to generate investment in economically disadvantaged counties across Georgia, this income tax credit for manufacturing spending marginally stimulates economic development and promotes a small amount of employment. More affordable manufacturing investment increases building opportunities for new commercial structures and purchases of new industrial equipment. Building projects produce jobs in the construction industry, along with jobs in related areas such as landscaping, building material production and sales, architecture, surveying, and legal services. In addition, investment in new equipment produces jobs in the equipment manufacturing industry, along with jobs in various related areas such as parts manufacturing.

Several pros and cons exist in consideration of offering an investment tax credit to manufacturing firms. Such a credit has the potential to offset a modest amount of the tax burden on businesses. The credit also creates jobs and modestly stimulates the economy without causing a major contraction in the manufacturing industry due to the relatively inelastic nature of the demand for new equipment and construction in the manufacturing industry. The tax credit would primarily impact firms making large investments in new buildings or other structures and new equipment in disadvantaged counties. As a result of making investment less expensive, the credit would have a positive impact on the number of manufacturing jobs in the state. As noted earlier in this report, the expansive increase in the number of state jobs should be interpreted with caution, as the IMPLAN model results simply mean that sufficient revenue would be generated to *support* this many jobs. One obvious consideration may be that such a tax could be used to reduce the state's tax burden in other areas.

In pursuit of an enhanced ROI, policymakers may consider a few possible changes to the structure of the tax credit. It may consider removing categories of manufacturing expenditures that produce little or no impact from the tax credit, primarily land transactions and used building purchases. It may also consider removing the credit for equipment purchases given most of the equipment purchases are not occurring in Georgia and thus are not impacting the state economy.

Appendix

A. INFORMATION ON NAICS SECTOR 31-33 AS DEFINED BY THE US CENSUS BUREAU

The Manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembling of component parts of manufactured products is considered manufacturing except in cases where the activity is appropriately classified in Sector 23 as Construction Establishments in the Manufacturing sector are often described as plants, factories, or mills and characteristically use power driven machines and material handling equipment. However, establishments that transform materials or substances into new products by hand or in the worker's home, and those engaged in selling to the general public products made on the same premises from which they are sold, such as bakeries, candy stores, and custom tailors, may also be included in this sector. Manufacturing establishments may process materials or may contract with other establishments to process their materials for them. Both types of establishments are included in manufacturing. Selected industries in the Manufacturing sector are comprised solely of establishments that process materials for other establishments on a contract or fee basis. Beyond these dedicated contract manufacturing industries, establishments that process materials for other establishments are generally classified in the Manufacturing industry of the processed materials.

The subsectors in the Manufacturing sector generally reflect distinct production processes related to material inputs, production equipment and employee skills. In the machinery area, where assembling is a key activity, parts and accessories for manufactured products are classified in the industry of the finished manufactured item when they are made for separate sale. For example, an attachment for a piece of metalworking machinery would be classified with metalworking machinery. However, component inputs from other manufacturing establishments are classified based on the production function of the component manufacturer. For example, electronic components are classified in Subsector 334, Computer and Electronic Product Manufacturing, and stampings are classified in Subsector 332, Fabricated Metal Product Manufacturing.

Manufacturing establishments often perform one or more activities that are classified outside the Manufacturing sector of NAICS. For instance, almost all manufacturing has some captive research and development or administrative operations, such as accounting, payroll, or management. These captive services are treated the same as captive manufacturing activities. When the services are provided by separate establishments, they are classified in the NAICS sector, where such services are primarily not in manufacturing. The boundaries of manufacturing and the other sectors of the classification system can be somewhat blurry. The

establishments in the Manufacturing sector are engaged in the transformation of materials into new products.[7]

B. ECONOMIC MODELING USING IMPLAN

Economic impact modeling is a technique used to estimate how a new firm, facility, or policy change will affect a region's economy. Such estimates are often produced using an input-output model that first calculates a baseline forecast of economic activity for the geographic region and then estimates how shocks (inputs) to the economy alter economic activity (output). In this report, Institute of Government researchers estimated the economic impact of a tax credit for manufacturing investment.

Institute researchers use IMPLAN, a widely used county-level economic model of the United States, to estimate the economic impact of the special deduction[8]. This model produces a baseline economic forecast using data from the US Census Bureau, the North American Industry Classification System (NAICS), the Bureau of Economic Analysis, and the Bureau of Labor Statistics as well as other data from the US Department of Commerce.

In IMPLAN, an input, or change to the economy, is added to the model. Inputs can be new jobs, labor income, increased demand for goods and services, or policy changes, such as tax deductions. IMPLAN estimates the increase or decrease in economic activity resulting from the change. The economic measures reported by the model include the number of jobs supported, the labor income associated with those jobs, the value added (or lost) to the economy in the geographic region being studied, and the total economic output added (or lost) because of the change. IMPLAN provides estimates of the direct, indirect, and induced effects of an economic event – in this case, the manufacturing investment tax credit. Direct, indirect, and induced effects are estimated for employment, labor income, value-added impact, and total output impact.

[7] (NAICS Sector 31-33 For Manufacturing, 2025)

[8] IMPLAN® model, 2021 Data, using inputs provided by the user and IMPLAN Group LLC, IMPLAN System (data and software), 16905 Northcross Dr., Suite 120, Huntersville, NC 28078 www.IMPLAN.com

C. PRICE ELASTICITY OF DEMAND

The pivotal question in most tax credit studies is commonly referred to as the "but for" question. It seeks to answer the question, "but for" the tax credit, how would taxpayers behave, and thus resultant tax collections, be different? In the case of manufacturing income tax and GMITC credit, researchers approach the question by means of a counterfactual example, in other words, by asking the question of how new construction and equipment spending might be different if the tax credit was with and without the manufacturing investment tax credit.

In the field of economics, this amounts to estimating the price elasticity of demand for new manufacturing industry spending. The price elasticity of demand for any good is the percentage change in the quantity demanded given a 1% change in its price. To apply this terminology to the case of manufacturing spending, if the price of new equipment and construction were to rise by 1% in the absence of the tax credit, demand could logically be expected to either fall or stay the same depending on buyer sensitivity to price (i.e. elasticity). If the demand for new equipment and construction in the manufacturing industry were to fall in response to rising prices, the demand for spending would be termed elastic, and if it were to stay the same, it would be termed inelastic. In short, answering the question "but for" is synonymous with estimating the price elasticity of demand. In general, the bulk of new manufacturing spending (investment) is in construction and thus we utilize elasticities associated with that industry.

Several academic researchers sought to estimate the price elasticity for housing demand in the United States over the last several decades, though more recent studies use price elasticity of housing demand as to examine more complicated housing trends and outcomes. Researchers estimate the short run price elasticity of housing demand to be relatively inelastic, with values between –0.12 and –0.697. Hanushek and Quigley (1980) prepare price elasticity estimates to understand the responsiveness of housing demand when major US cities face price changes.[9] With a simple adjustment model, the short-run price elasticity estimates for Pittsburgh and Phoenix are -0.12 and -0.16. A more general equation for the expanded adjustment model produces price elasticities of –0.36 for Pittsburgh and –0.41 in Phoenix.

Goodman (1988) derives a model for permanent income, housing price, tenure choice, and housing demand, which is then used to estimate the renter and owner price elasticity of demand for housing.[10] The combined owner and renter price elasticity is -0.464 in the short run. Ioannides and Zabel (2003) find the price elasticity to be –0.199 when using the standard

[9] Hanushek, Eric A., and Quigley, John M. "What is the Price Elasticity of Housing Demand?" Review of Economics and Statistics, August 1980.

[10] Goodman, Allen C. "An econometric model of housing price, permanent income, tenure choice, and housing demand." *Journal of Urban Economics*, May 1988.

housing demand equation.[11] After developing a reduced form equation for own housing demand with neighbors' socioeconomic and house characteristics as additional regressors, the price elasticity is –0.427. The log-linear housing demand model with cluster-specific random effects produces a price elasticity of –0.244. Albouy et al. (2016) determine a housing demand estimate with a framework based on spatial equilibrium conditions.[12] The uncompensated price elasticity of demand is –0.697. An own-price elasticity of –0.55 is derived from BEA data backed by the official Consumer Price Index. While Ermisch et al. (1996) study the price elasticity of housing demand in the UK, the short-run price elasticity of demand is comparable to US examples with an estimate of –0.4.[13] The resulting weighted average price elasticity of demand for residential and commercial construction was -0.05. This elasticity measure was used to estimate the reduction in tax revenue on manufacturing collected in the state if the full cost of a tax increase resulting from removal of the manufacturing investment tax was passed on to consumers.

Institute of Government researchers also estimated an econometric model internally that found an average own-price elasticity of demand across county tiers for manufacturing spending was consistent with the academic literature. It is worth noting that this finding is logical given that the majority of new manufacturing spending is on construction and mirrors the results found in the literature for that industry.

[11] Ioannides, Yannis M., and Zabel, Jeffrey E. "Neighborhood Effects and Housing Demand". *Journal of Applied Econometrics*, September 2003.
[12] Albouy, David et al. "Housing Demand, Cost-of-Living Inequality, and the Affordability Crisis." *NBER Working Paper 22816*, November 2016.
[13] Ermisch, J.F. et al. "The Price Elasticity of Housing Demand in Britain: Issues of Sample Selection." *Journal of Housing Economics*, 5(1), March 1996.