November 2022

Fiscal Research Center

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David L. Sjoquist

Peter S. Bluestone

Georgia State University | Andrew Young School
Fiscal Research Center

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Prepared by:

Georgia State University
Fiscal Research Center

For:

Georgia Department of Audits and Accounts

November 2022

Authors:
David L. Sjoquist*
Peter S. Bluestone

* Professor of economics, FRC faculty affiliate, and principal author; sjoquist@gsu.edu

Acknowledgements:
Several people assisted in the preparation of this report, including Robert Buschman, Jonathan Coulborn, Tricia DePadro, Rusty Haygood, and Lakshmi Pandey. Their help is greatly appreciated.

Fiscal Research Center
Andrew Young School of Policy Studies
Georgia State University
14 Marietta Street NW
Atlanta, Georgia 30303

Executive Summary

Georgia's Job Tax Credit program was instituted in 1990, at which time its primary purpose was to increase employment in Georgia's 40 most distressed counties. The stated purpose of the Job Tax Credit program is to encourage the further economic development of the state, and its objective is to encourage businesses to locate and expand in the state. This report presents an evaluation of the effect of Georgia's Job Tax Credit program in terms of its economic and fiscal impact on the state.

Georgia's Job Tax Credit Program

Since 1990, many changes have been made to Georgia's Job Tax Credit program, including the expansion of the program to all counties, increases in the credit amounts, and changes in the minimum number of jobs that must be created to be eligible for the credit**.** Each year, Georgia's 159 counties are grouped into four tiers based on economic conditions in the county, with Tier 1 encompassing the 71 most disadvantaged counties. The next 35, 35, and 18 counties are assigned to tiers 2, 3, and 4, respectively. Except in the case of the counties ranked 1st through 40th least developed, only jobs created in certain industries are eligible for a job tax credit. Job tax credits range across tiers from $750 to $3,500 per job per year for up to five years, and the required minimum number of new jobs ranges from 2 to 25. In specially designated areas within counties, and for qualified existing businesses, the value of a job tax credit may be greater than the credit that otherwise applies in the county based on its tier.

Activity Data

Table ES1 shows for 2019 and 2020 the number of new credit-earning jobs by county tier assignment and statewide. Note that the number of jobs that earn a job tax credit in a year is much larger than the number of new credit-earning jobs since a firm can claim a credit for a new job for five years as long as the job is maintained. Based on the data file provided by the Georgia Department of Revenue, there were 67,902 jobs that earned a job tax credit in 2019 but only 22,668 new credit-earning jobs. Tier 3 counties have the most new credit-earning jobs in each year and about 48 percent of the statewide total over the two-year period. For the period, the average credit per job is a little less than $3,000, the midpoint between the base annual credit amount per job for tiers 1 and 2. The average number of credited jobs per establishment is between 50 and 55.

Table ES1. Credited Jobs by Tier and Year

Year	Tier 1	Tier 2	Tier 3	Tier 4	State
2019	3,238	4,281	11,297	3,852	22,668
2020	2,583	5,600	12,190	5,949	26,322

In 2019 and 2020, 73 and 64 counties, respectively, had no new credited jobs. Most of these counties without credited jobs are located in the southern half of the state. Counties with the largest number of credited jobs are generally located in the core of Metropolitan Statistical Areas, although there are exceptions.

Manufacturing and retailing are the industrial categories with the largest share of credited jobs, about 20 percent each, while about 9 percent are in transportation and warehousing. Other industrial categories have a small percentage of credited jobs, most with less than one percent of the total, though more than 20 percent of firms in the period reviewed did not have an industrial (NAICS) code.

"But For" Condition

Estimating the economic effect of a job tax credit (JTC) program first requires determining how many jobs earning a tax credit were created as a direct result of the JTC program, which is the "but for" question. The effect of a JTC program on a state's economy and fiscal conditions depends on the number of jobs for which the JTC was decisive in creating jobs, not the number of jobs that earn a tax credit.

A firm might expand its labor force in response to several possible factors, including job tax credits. But there are other reasons why a firm will increase employment, including an increase in the demand for its product or service. Thus, we expect that less than 100 percent of the increase in a firm's employees are hired because of the job tax credit, i.e., but for the tax credit.

The literature suggests that the number of jobs created because of a job tax credit is small. In fact, most of studies of JTC programs find no statistically significant effect on employment resulting from JTC programs. The reason is that, as in the case of Georgia, the value of the job tax credit is small relative to the cost of adding a new worker. The cost includes the wages, fringe benefits, hiring cost, administrative cost, and the cost of associated equipment. Furthermore, in Georgia in most tiers the firm must apply the tax credit against the firm's tax liability, and thus the tax credit might not be of much value to the firm if it has a small tax liability.

Even if the job tax credit caused a firm to hire a new worker, it is not necessarily the case that the new job represents an increase in jobs in the state. For example, new workers could be hired away from other firms in the county. There are studies that find that the opening of a new business does not always lead to a net increase in county employment.

Reported new jobs at a business might be the result of shifts in employment between establishments located in different counties of a given firm, but with no increase in total employment. Also, in the absence of a job tax credit a firm might add a few workers each year for multiple years, but not enough to be able to claim a job tax credit in any given year. But to qualify for a job tax credit the firm might bunch the hiring into one year.

The research on Georgia's job tax credit program by Kuehn (2016) and Gurmu, Sjoquist, and Wheeler (2021) suggests that a very small percentage of new jobs were due to the job tax credit program, while Faulk (2002) finds that about 25 percent of new jobs are the result of the job tax credit program. Faulk's estimate is much larger than estimates from other studies of JTC programs.

There are other studies that provide estimates of the percentage of new jobs for which the job tax credit is decisive in creating the job. Luger and Bae (2005) estimate the employment effect of tax incentives in North Carolina and find that the job tax credits were decisive for only 1.23 percent of the jobs that were provided a job tax credit. Bartik and Erickceh (2014) study the Michigan Economic Growth Authority (MEGA) credits and estimate that the MEGA credit is decisive for 8.25 percent of the jobs receiving a MEGA credit. Bartik (2006) estimates that a typical incentive package is decisive for 3.7 percent of the jobs that the firms create.

Bartik (2018) reviewed 34 studies that provide estimates of the decisive percentage and concludes that "typical incentives probably tip somewhere between 2 percent and 25 percent of incented firms." Bartik claims that 23 of the studies that he reviewed are positively biased, i.e., the methodology causes the estimates to overstate the effect, 4 are negatively biased, and 7 have an unbiased methodology. For these 7 unbiased studies, the average decisive percent is 6.7 percent while the median is 3.4 percent. Bartik concludes that 11.4 percent is a reasonable upper bound of the estimates of the decisive percentage.

Economic and Fiscal Impact Analysis

Using the IMPLAN model, which is a regional input-output model widely used for economic impact analysis, we estimate the economic effects of jobs created in 2019 as a result of Georgia's JTC program, and then using the estimated economic effects, we estimate the resulting state and local tax revenue. IMPLAN produces estimates of employment, wages, value added (which is the contribution to state gross domestic product), and total output (which is the value of production).

We first derive estimates of the economic effect on Georgia from all new credit-earning jobs. The total economic effects, measured by employment, labor income, value added, and output, are the sum of the direct, indirect, and induced effects estimated by IMPLAN for the four economic measures. The economic effects under the assumption that job tax credits were decisive for 100 percent of jobs that earned a job tax credit, i.e., all 22,668 jobs were the result of the JTC program are reported in the first row of Table ES2.

Table ES2. Total Economic Effect of New Jobs

($ *millions*)	**Employment**	**Labor Income**	**Value Added**	**Output**
Assumed Decisive Percent:				
100% -- All Credited Jobs	50,954	$3,045.3	$5,300.2	$11,566.5
5% of Credited Jobs	2,548	$152.3	$265.0	$578.3
11.4% of Credited Jobs	5,809	$347.2	$604.2	$1,318.6
Alternative Use of Funds:				
Increase in State Expenditures	1,771	$72.5	$88.0	$138.5

The values in the first row do not measure the economic effects of Georgia's JTC program because Georgia's JTC program was not decisive for 100 percent of the jobs that earned a job tax credit, i.e., all 22,668 new jobs. As discussed above, most studies of the effect of JTC programs on employment find that these programs have little effect on job creation.

In this light, we first assume that only 5 percent of jobs that earn a tax credit were created as a result of the JTC program. This follows the studies from Pennsylvania and Maryland that use 5 percent, and is consistent with the findings of Kuehn (2016) and Gurmu, Sjoquist, and Wheeler (2021) in their analyses of Georgia's JTC program. They find that Georgia's JTC program has little to no effect on job creation. As an alternative, we redo the analysis assuming a decisive percent of 11.4 percent. This percentage comes from Bartik's (2018) literature review, which finds that 11.4 percent is a reasonable upper bound of the estimates of the decisive percentage. The total economic effects under these two cases are shown in the second and third rows of Table ES2.

The economic effects reported in Table ES2 do not account for the opportunity costs of the forgone state revenues, i.e., the economic impacts of alternative uses of the funds expended through the tax credits. In 2019, the 22,668 credited new jobs generated $65,550,270 in tax credits. If Georgia did not fund the JTC program, it would have those funds to spend in an alternative way, which would also generate economic effects. Absent information as to how the General Assembly would otherwise choose to spend this revenue, if not on job tax credits, we estimate the impact of using the revenue to fund an equivalent increase of $65,550,270 in state government spending in proportion to existing expenditures. Row 4 in Table ES2 reports the economic effects of this alternative. The values in row 4 are smaller than for the other rows, which implies that $65.9 million in general state government spending, the costs of the credits and administration of the program, would generate smaller economic effects than funding the JTC program, even if the decisive percentage is less than 5 percent.

The first and second rows of Table ES3 are estimates of the effects of Georgia's JTC program on state and local tax revenue for the two alternative decisive percentages. The third row presents the equivalent estimate for increasing state expenditures by $65.9 million.

Table ES3. Estimates of Government Revenue

($ *millions*)	**State Tax Revenue**	**Local Tax Revenue**	**Total Tax Revenue**	**JTC Program Cost**
5% Decisive Percentage	$11.8	$9.4	$21.2	$65.9
11.4% Decisive Percentage	$26.9	$21.3	$48.2	$65.9
Increase State Expenditures	$3.8	$1.6	$5.4	$65.9

There are costs associated with the JTC program, the largest being the $65.6 million in earned tax credits. In addition, there are state agency costs of administrating the JTC program. The estimates of the administrative costs are $195,000 for the Department of Community Affairs and $131,000 for the Department of Revenue. The total cost of the JTC program is $65.9, which is showed in the last column of Table ES3. The total cost is larger than the additional state and local revenue generated. Thus, Georgia's JTC program results in a net loss to the state.

The $65.6 million in job tax credits is for the 22,668 new jobs created in 2019, not for the 67,902 new and retained jobs that earned a JTC in 2019. These jobs, new and retained, earned $201,604,270 in job tax credits in 2019.

Table ES4 contains the Return on Investment (ROI) under the assumptions of a 5 percent and an 11.4 percent decisive percentage. For this calculation we use the increase in the sum of state and local tax revenue, and the total of the cost of job tax credits and the administrative costs. As implied by Table ES3, the ROI is negative and large for both decisive percentages.

Table ES4. Estimates of the Return on Investment

	Return on Investment
5% Decisive Percentage	-67.8%
11.4% Decisive Percentage	-26.9%

Since the state tax revenue that is generated is smaller than the sum of state and local tax revenue, a larger decisive percentage is required to generate sufficient state tax revenue to cover the cost of the JTC program by itself. Thus, we also estimated the decisive percentage that is required for the program to breakeven on state revenues alone. A decisive percentage of 15.5 percent is required to generate sufficient state and local revenue to break even, i.e., generate $65.9 million of state and local revenue, and 27.9 percent to break even in terms of state revenues alone.

Some, but not all, new credited jobs created in one year will still exist in future years. Thus, the state will reap the benefit of the jobs created by the JTC for several years. But the state will continue to pay job tax credits for five years for jobs that are retained. We thus estimate the present value of the JTC program, assuming a ten-year horizon. We first estimated the percentage of new jobs that are retained in each year over 10 years. We then calculated the effect of the JTC program on state net revenue for each year for 10 years and found the present value assuming a discount rate of 2.625 percent.

For the case of the 5 percent decisive rate, the present value of the stream of net revenue is a loss totaling $172.7 million. For the case of the 11.4 percent decisive rate the present value of the 10-year stream of net revenue is a loss of $87.3 million.

Contents

1. Introduction

This report presents an evaluation of the effect of Georgia's Job Tax Credit (JTC) program in terms of its economic and fiscal impact on the state.

Georgia's JTC program was instituted in 1990, at which time its primary purpose was to increase employment in Georgia's 40 most distressed counties. Since 1990, many changes have been made to the program, including the expansion of the program to all counties, increases in the credit amounts, and changes in the minimum number of jobs that must be created to be eligible for the credit. While there have been studies of Georgia's JTC program, this is the first to estimate its economic and fiscal effects.

Key to estimating the economic and fiscal effects of a JTC program is knowing the number of jobs that are created because of the program, not just the number of jobs that earn a job tax credit. The number of jobs created due to the job tax credit is smaller than the number of jobs that earn job tax credits. Thus, to estimate the economic and fiscal effects, it is necessary to estimate the size of the "but for" assumption, i.e., the percentage of jobs that receive a job tax credit that would not have been created but for the job tax credit.

Thus, after describing the job tax credit program in Georgia and in 10 other southern states, we review existing studies of the effects of job tax credit programs on job creation, which we use as the basis for our "but for" assumption. Given this assumption we estimate the economic and fiscal effects of Georgia's JTC program using IMPLAN, which is an existing regional input-output empirical modelling software program.

2. Overview of Georgia's Job Tax Credit Program

This section summarizes the current (as of January 2022) structure of Georgia's JTC program.[1] This overview is an update of the first section of Sjoquist and Wheeler (2013).

According to the state's rules and regulations, the purpose of the Job Tax Credit program is to encourage the further economic development of the state, and its objective is to encourage businesses to locate and expand in the state.

Georgia has adopted the definition of a Business Enterprise as meaning "any corporation, partnership, limited liability company, or sole proprietorship, or the headquarters of any such corporation, partnership, limited liability company, or sole proprietorship, which is engaged in manufacturing, warehousing and distribution, processing, telecommunications, broadcasting, research and development, or tourism in a less developed area. Such term does not include retail businesses. The definition of Business Enterprise under the county tier program in O.C.G.A. §48-7-40 shall also include any business which is engaged in services for the elderly and persons with disabilities."

There are four Georgia Code sections that are relevant to the JTC program, O.C.G.A. §48-7-40, §48-7-40.1, §48-7-40.15A, and §36-62-5.1. The first two sections, §48-7- 40 and §48-7-40.1

[1] We thank Tricia DePardo for helpful comments on an earlier draft of this section.

reference designations of the Jobs Tax Credit program. The other two sections, §48-7-40.15A and §36-62-5.1, refer to enhancements to the job tax credits. The following summary of the JTC program, which includes both credits, is drawn from these four Georgia Code sections as of January 2022. The discussion in this section provides general information only and is not intended as legal advice or opinion.

Section 48-7-40

Tiers and Eligible Industries. Georgia's 159 counties are grouped into four tiers by the Georgia Department of Community Affairs (DCA) based on economic conditions in the county. Each year, DCA ranks counties according to 1) the highest unemployment rate for the most recent 36-month period; 2) the lowest per capita income for the most recent 36-month period; and 3) the highest percentage of residents living below the poverty level according to the most recent data available. The most distressed county in each category is ranked number one. The three rankings are then combined using equal weights for each factor. DCA divides the counties into four tiers, with Tier 1 encompassing the most economically disadvantaged counties. By Georgia law, the 71 counties with the lowest (most distressed) combined ranking are designated as Tier 1 counties. The next 35, 35, and 18 counties are designated as Tier 2, Tier 3, and Tier 4 counties, respectively. The Commissioner can move a tier 4 county to a tier 3 designation or a tier 3 county to a tier 2 designation or tier 2 county to a tier 1 designation if the county undergoes a sudden and severe period of economic distress caused by the closing of one or more business enterprises located in such county.

JTC Parameters. The credit amount per job and the minimum number of jobs that must be created and maintained varies by tier, as shown in the Table 1.

Table 1. JTC Parameters by Tier

	Tier 1	Tier 2	Tier 3	Tier 4
Number of Counties	71	35	35	18
Minimum New Jobs to be Eligible	2	10	15	25
Value of Job Tax Credit	$3,500	$2,500	$1,250	$750

For all but the counties ranked 1 through 40, only jobs created in certain industries are eligible for a job tax credit. The eligible industries include:

- manufacturing, including but not limited to, alternative energy products for use in solar, wind, battery, bioenergy, biofuel and electric vehicle enterprises
- warehousing and distribution
- processing
- telecommunications
- broadcasting
- tourism
- research and development industries
- biomedical manufacturing
- services for the elderly and persons with disabilities.

The JTC regulations list many NAICS codes for eligible industries. Any business or the headquarters of any such business engaged in these industries is eligible. A firm may be a group of several business establishments, e.g., branch plants. Retail businesses are explicitly excluded. However, all businesses in counties ranked as the first through fortieth least developed counties are eligible if they create at least the required minimum number of jobs. In addition, retail businesses under the state Opportunity or Military Zone designation also qualify.

A firm must create the required minimum number of jobs in a particular establishment to qualify for the JTC. However, a multi-establishment firm may combine the employment of its establishments that are located in the same county.

Calculating Eligible Jobs. The number of new full-time jobs is determined by comparing the monthly average number of full-time employees subject to Georgia income tax withholding for the taxable year with the corresponding period of the prior taxable year. For a job to qualify for a credit, the wage of each new job created must be above the average wage of the county that has the lowest average wage of any county in the state, which for tax year 2022 is Glascock County at $602 per week, or $31,304 for the year. In addition, the employer must make health insurance coverage available to the new employees if the firm provides health insurance coverage for other employees.

Applying the Credits. The credit can be taken against personal or corporate income tax for each year for five years beginning in the year the job was created, if the jobs are maintained. If additional new full-time jobs are created after the business begins taking a credit, the business can claim a credit for the additional new jobs for five years as long as they are maintained. Unused credits may be carried forward for ten years from the close of the taxable year in which the qualified jobs were established. In tiers 3 and 4 the credit taken in any one taxable year cannot exceed 50 percent of the taxpayer's state income tax liability. A firm in a tier 1 county can take the credit against the enterprise's Georgia income tax withholding payments.

Other Provisions. The sale, merger, acquisition, or bankruptcy of any business enterprise does not create new eligibility for any succeeding business entity, but any unused job tax credit may be transferred and continued by any transferee of the business enterprise. In general, though, job tax credits cannot be transferred or sold.

The commissioner of economic development can designate a "competitive project", which means the expansion or location of some or all of a business enterprise's operations in this state having significant regional impact but that would have located or expanded outside this state without the tax credits. Firms so designated are allowed to take the credit against income tax withholding payments regardless of tier level.

Section 48-7-40.1

The JTC program also applies to certain specially designated less developed areas that are smaller than a county. In general, an area consisting of 10 or more contiguous census tracts can be designated as a less developed area if it meets the economic conditions of the 71st ranked county or lower. In addition, the commissioner of the DCA can designate four other types of less developed areas, which include:

(1) Any area comprised of ten or more contiguous census tracts which, in the opinion of the commissioner, undergoes a sudden and severe period of economic distress caused by the closing of one or more business enterprises located in such area.
(2) Any area comprised of one or more census tracts adjacent to a federal military installation where pervasive poverty is evidenced by a 15 percent poverty rate or greater as reflected in the most recent decennial census.
(3) Any area which is within or adjacent to one or more contiguous census block groups with a poverty rate of 15 percent or greater as determined from data in the most current United States decennial census, where the area is also included within a state enterprise zone or where a redevelopment plan has been adopted and which, in the opinion of the commissioners (both DCA commissioner and the Department of Economic Development's commissioner) displays pervasive poverty, underdevelopment, general distress, and blight.
(4) Census tracts in a county that contains a federal military installation with a garrison of at least 5,000 federal or military personal combined and contains an industrial park that is owned and operated by a government entity.

Businesses located in less developed areas are eligible for a $3,500 job tax credit if they increase employment by 5 or more jobs. In areas of pervasive poverty (i.e., those described in paragraphs (2) and (3) above) businesses must increase employment by two or more jobs in order to be eligible for the credit.

Establishments that manufacture personal protective equipment and are otherwise eligible for a job tax credit are allowed an additional $1,250 credit. Likewise, effective for jobs created on or after July 1, 2021, establishments that manufacture medical equipment, medical supplies, pharmaceuticals, or medicine and are otherwise eligible for a job tax credit are allowed an additional $1,250 credit. However, a business cannot claim both of these special tax credits.

Section 36-62-5.1
Firms that quality for a job tax credit and that are located in a county that is part of a joint economic development authority are allowed an additional $500 tax credit per new job, but only if claimed under the Tier designation of the Job Tax Credit program. This tax credit is treated the same as the job tax credit awarded under Georgia code §48-7-40. However, it may not be taken against Georgia income tax withholding.

Section 48-7-40.15
Business enterprises that meet the qualifications of the Port Tax Credit (§48-7-40.15) and which also qualify for the Jobs Tax Credit under section 40 or section 40.1 are eligible to receive an additional $1,250 annual enhancement to the Jobs Tax Credit.[2]

Georgia has other tax credit programs that are associated with employment. These programs are described in Appendix A.

[2] Firms may also qualify for this additional credit by meeting the qualifications specified under the Alternative Port Tax Credit, 48-7-40.15A.

3. JTC Activity Data for Georgia

This section presents a summary of the information on job tax credits generated by the Georgia Department of Revenue (DOR) from income tax returns. Panel A of Table 2 provides summary data on job tax credits generated, utilized, and carried over for each of 6 fiscal years, 2017 through 2022. For each year, credits generated (column 1) are the values of credits earned for jobs created in that year plus retained jobs created in the prior four years. Credits utilized (column 2) are the credits taken against income tax liabilities on income tax returns filed during that fiscal year, and thus represent the cost to the state of the job tax credit program. Figure 1 is a graph of the data reported in Panel A of Table 2.

Job tax credits generated range from $170.7 million to $320.8 million; there is no evident trend, although the values increase from 2018 to 2020 and then decrease. For the entire period, the value of job tax credits utilized is about 63 percent of the amount generated, although the annual percentage varies over the period.

Panel B of Table 2 are the projected tax expenditures for FY 2023 through FY 2028 for the JTC program. Tax expenditures are projected to increase over time, reaching $263.0 million in FY 2028. Figure 2 is a graph of tax expenditures, both Panel A and Panel B of Table 2.

Table 2. Value of Job Tax Credits

	[1]	[2]	[3]
Fiscal Year	**Credits Generated**	**Credits Utilized (Tax Expenditures)**	**Credits Carryover to Next Year**
Panel A: Reported			
2017	$193,445,997	$56,900,499	$263,117,162
2018	$170,692,798	$54,507,935	$379,302,024
2019	$208,113,016	$123,656,415	$463,758,626
2020	$320,838,691	$178,239,061	$606,358,256
2021	$290,542,517	$222,957,273	$673,943,500
2022	$255,730,067	$270,160,940	$659,512,626
Panel B: Projected			
2023		$234,780,670	
2024		$231,648,204	
2025		$240,768,784	
2026		$248,844,441	
2027		$256,151,645	
2028		$262,899,734	

Source: Georgia DOR

Figure 1. Reported JTC Data

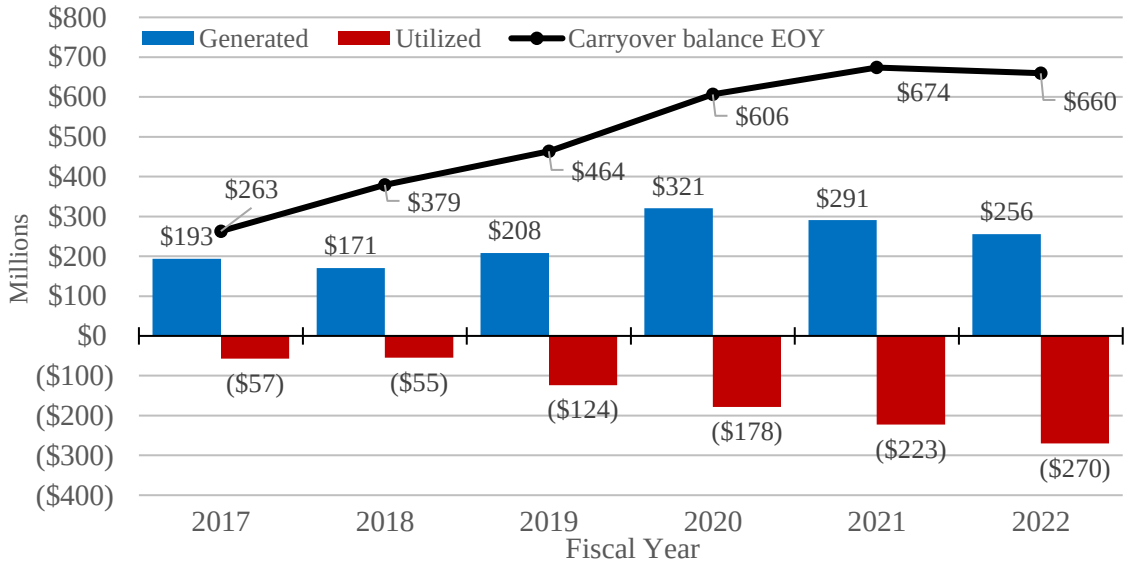
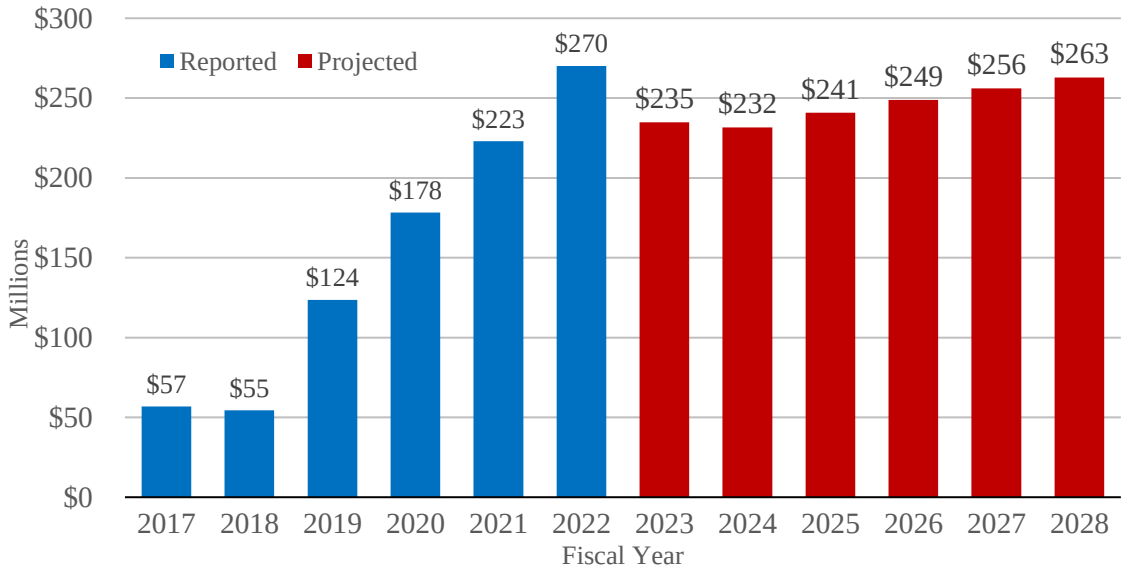


Figure 2. Reported and Projected Tax Expenditure



DOR could not provide the number of jobs created in a given year that earned a job tax credit. However, DOR did provide data files for four years 2018-21 that include, by enterprise, the number of jobs that earned a job tax credit for the year, including those created in that year plus retained jobs that were created in the prior four years. We refer to these data as the cumulative 5-year data. Note that we have credits earned, not credits taken against tax liabilities during the year, thus cost is on an accrual and not cash basis.

We used these data to estimate the number of jobs created in 2019 and 2020 that earned a tax credit. We do that by identifying enterprises that were in the cumulative 5-year file in 2019 but

not in 2018, and similarly for 2020. Our procedure assumes that these enterprises created the jobs in that year.

We note two caveats about this estimate. First, it is possible that a firm taking a credit in 2019 actually hired that person in a prior year. Our data would count this as a hire in 2019, but we have no way to identify such a hire. Second, firms that are in the cumulative 5-year file in both 2018 and 2019 could have added or lost jobs in 2019. We do not include these changes since we cannot identify the value of the job tax credit for those workers. However, the additional jobs are mostly offset by decreases in jobs.

Table 3 shows the number of new jobs in 2019 and in 2020 that earned a job tax credit (which we will refer to as credited jobs), total credits earned, and the number of businesses earning a job tax credit. The number of new jobs and credits for 2020 are somewhat larger than 2019, despite the economic downturn in 2020 caused by the COVID pandemic. Credits per job is a little less than $3,000, which is about the midpoint between the allowable credit per job for tiers 1 and 2.

Table 3. New Jobs, Credits, and Establishments by Year

Year	New Credit-Earning Jobs	Credits Earned	Number of Enterprises	Credits per New Job	New Jobs per Enterprise
2019	22,668	$65,550,270	486	$2,892	46.7
2020	26,322	$73,210,856	463	$2,781	56.9

The cumulative 5-year data reports that there were 67,902 jobs, including both new and retained jobs, that earned a credit in 2019. These jobs earned $201,604,270 in job tax credits in 2019.

Table 4 shows by year the number of new credited jobs in counties grouped by their tier assignment. Tier 3 counties have the most jobs earning a job tax credit in each year, a little less than 50 percent of total jobs for the two years. The number of jobs varies by year for the other three tiers.

Table 4. New Jobs by Tier and Year

Year	Tier 1	Tier 2	Tier 3	Tier 4	State
2019	3,238	4,281	11,297	3,852	22,668
2020	2,583	5,600	12,190	5,949	26,322

Given this distribution of credited jobs by tier and the allowed credits per job as shown in Table 1, it would be expected that the credit per credited job would be less than $2,000. In fact, if we use the distribution of jobs by tier for 2020 and the credit values in Table 1, the expected credit per credited job is $1,624. This is more than $1,000 less than the credit per job reported in Table 3. However, as noted in Section 2, credits earned per credited job can exceed the base credit

value for a variety of reasons. For example, in 2022 there are 471 less-developed census tracts outside Tier 1 counties that are eligible for a $3,500 job tax credit.[3]

Table 5 shows the distribution for 2019 of firms and jobs by job tax credit per job. Over 75 percent of the firms received a job tax credit per job of $3,500 or more, while slightly less than 50 percent of jobs earned job tax credit of $3,500 or more.

Table 5. Job Tax Credits per New Job, 2019

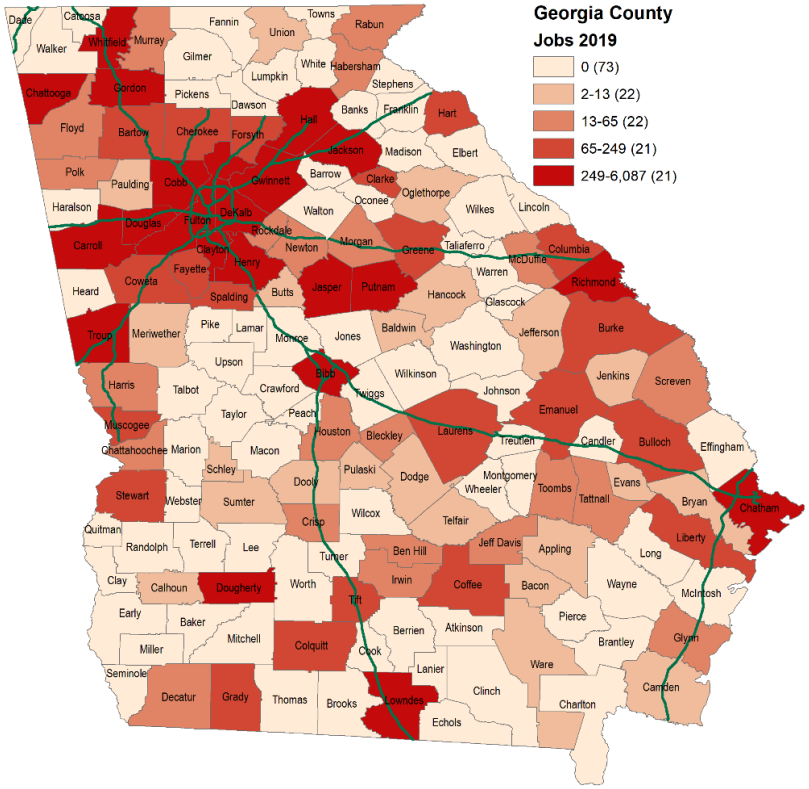
	Firms		Jobs	
JTC per New Job	**Number**	**Percent**	**Number**	**Percent**
< $750	1	0.2%	70	0.3%
$750 – < $1,250	6	12.3%	593	2.6%
$1,250 – < $2,500	86	17.7%	6,568	29.0%
$2,500 – < $3,500	25	5.1%	4,773	21.1%
$3,500 or more	368	75.7%	10,664	47.0%
Total	**486**	**100.0%**	**22,668**	**100.0%**

Maps 1 and 2 show the distribution of new jobs by county for 2019 and 2020, respectively, while Appendix Table B1 provides the number of jobs that received a job tax credit by county for each of the two years. In 2019 and 2020 there were 73 and 64 counties, respectively, for which there were no new jobs that earned job tax credits. Counties with the largest number of credited jobs are generally located in counties in the core of Metropolitan Statistical Areas, particularly in the northern half of the state.

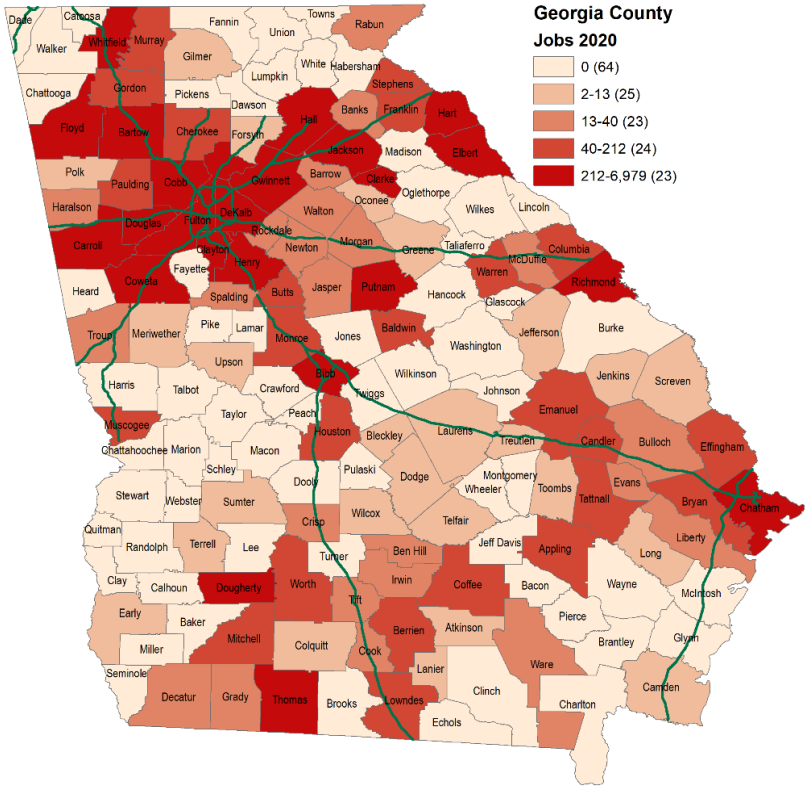
Map 3 shows the distribution using the cumulative 5-year data for 2019. There are 37 counties that had no job tax credits for the 5 years covered by the data. Most of these counties are in the southern half of the state.

[3] A list of these census tracts can be found at https://www.dca.ga.gov/sites/default/files/3d_final_2022_ldcts_1.pdf. In 2022, there are a total of 2,294 census tracts outside the Tier 1 counties.

Map 1. New Credited Jobs, 2019



Map 2. New Credited Jobs, 2020



Map 3. Five-Year Credited Jobs, 2019

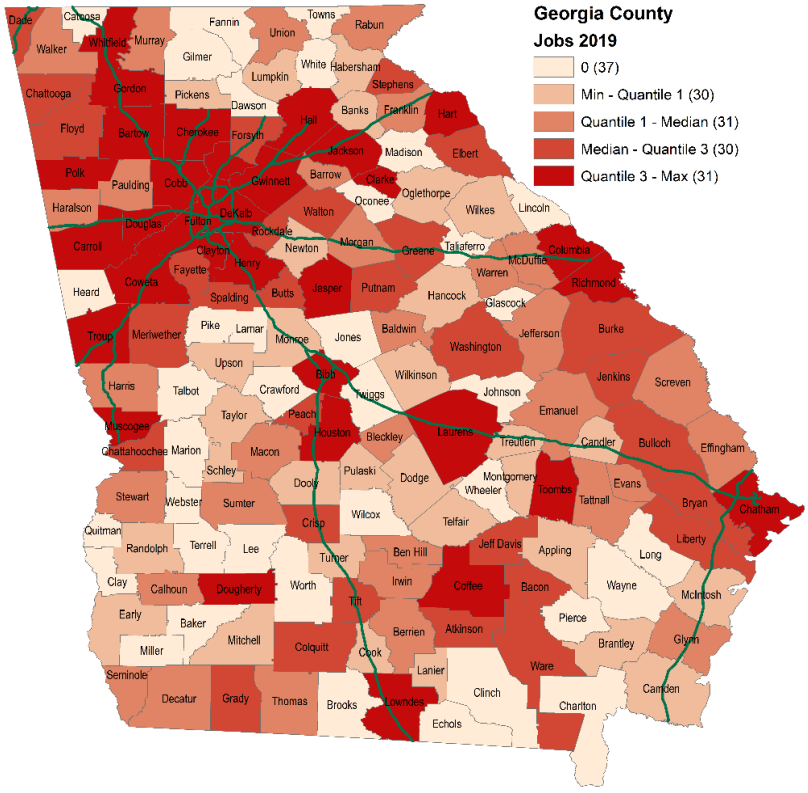


Table 6 shows the distribution by tier of new credited jobs by 2-digit NAICS industries for 2019. Unfortunately, more than 20 percent of the observations in the file did not have a NAICS code. Manufacturing, Retailing, and Transportation and Warehousing are the largest industrial categories statewide. Most of the other categories have a small percentage of credited jobs, most with less than one percent of the total. There is substantial variation in the distribution across tiers. Table 7 show the distribution of credited jobs by industry for 2019 using the cumulative 5-year data.

Table 6. Credited Jobs by Industry and Tier, 2019

	Tier 1		Tier 2		Tier 3		Tier 4		State	
	Emp	**Share**	**Emp**	**Share**	**Emp**	**Share**	**Emp**	**Share**	**Emp**	**Share**
Agriculture, Forestry, Fishing and Hunting	251	7.8%	-	0.0%	-	0.0%	-	0.0%	251	1.1%
Mining, Quarrying, Oil and Gas Extraction	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Utilities	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Construction	60	1.9%	60	1.4%	22	0.2%	101	2.6%	243	1.1%
Manufacturing	643	19.9%	1,999	46.7%	1,624	14.4%	523	13.6%	4,789	21.1%
Wholesale Trade	340	10.5%	80	1.9%	305	2.7%	703	18.3%	1,428	6.3%
Retail Trade	628	19.4%	962	22.5%	1,199	10.6%	1,173	30.5%	3,962	17.5%
Transportation and Warehousing	92	2.8%	105	2.5%	2,345	20.8%	403	10.5%	2,945	13.0%
Information	-	0.0%	53	1.2%	832	7.4%	-	0.0%	885	3.9%
Finance and Insurance	62	1.9%	91	2.1%	909	8.0%	-	0.0%	1,062	4.7%
Real Estate and Rental and Leasing	13	0.4%	-	0.0%	522	4.6%	-	0.0%	535	2.4%
Professional, Scientific, and Technical Svcs	24	0.7%	59	1.4%	302	2.7%	123	3.2%	508	2.2%
Management of Companies and Enterprises	9	0.3%	-	0.0%	547	4.8%	-	0.0%	556	2.5%
Administrative and Support and Waste Management and Remediation Services	119	3.7%	3	0.1%	363	3.2%	-	0.0%	485	2.1%
Educational Services	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Health Care and Social Assistance	5	0.2%	-	0.0%	8	0.1%	32	0.8%	45	0.2%
Arts, Entertainment, and Recreation	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Accommodation and Food Services	34	1.1%	-	0.0%	140	1.2%	13	0.3%	187	0.8%
Other Services (except Public Admin.)	2	0.1%	23	0.5%	20	0.2%	160	4.2%	205	0.9%
Public Administration	29	0.9%	-	0.0%	5	0.0%	-	0.0%	34	0.1%
No NAICS	927	28.6%	846	19.8%	2,154	19.1%	621	16.1%	4,548	20.1%
TOTAL	**3,238**	**100%**	**4,281**	**100%**	**11,297**	**100%**	**3,852**	**100%**	**22,668**	**100%**

Table 7. Credit Jobs by Industry and Tier Cumulative 5-Year Data, 2019

	Tier 1		Tier 2		Tier 3		Tier 4		State	
	Emp	**Share**	**Emp**	**Share**	**Emp**	**Share**	**Emp**	**Share**	**Emp**	**Share**
Agriculture, Forestry, Fishing and Hunting	430	3.4%	-	0.0%	-	0.0%	-	0.0%	430	0.6%
Mining, Quarrying, Oil and Gas Extraction	244	1.9%	-	0.0%	-	0.0%	-	0.0%	244	0.4%
Utilities	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%
Construction	179	1.4%	77	0.7%	160	0.5%	304	2.3%	720	1.1%
Manufacturing	3,566	28.3%	4,513	39.1%	3,977	12.9%	3,479	26.8%	15,535	22.9%
Wholesale Trade	764	6.1%	417	3.6%	1,590	5.2%	1,541	11.9%	4,312	6.4%
Retail Trade	1,429	11.3%	2,703	23.4%	4,450	14.5%	3,794	29.2%	12,376	18.2%
Transportation and Warehousing	1,588	12.6%	528	4.6%	3,697	12.0%	805	6.2%	6,618	9.7%
Information	68	0.5%	79	0.7%	1,370	4.5%	-	0.0%	1,517	2.2%
Finance and Insurance	89	0.7%	153	1.3%	2,016	6.6%	251	1.9%	2,509	3.7%
Real Estate and Rental and Leasing	59	0.5%	644	5.6%	812	2.6%	297	2.3%	1,812	2.7%
Professional, Scientific, and Technical Svcs	274	2.2%	234	2.0%	2,671	8.7%	421	3.2%	3,600	5.3%
Management of Companies and Enterprises	62	0.5%	142	1.2%	712	2.3%	33	0.3%	949	1.4%
Administrative and Support and Waste Management and Remediation Services	335	2.7%	53	0.5%	911	3.0%	74	0.6%	1,373	2.0%
Educational Services	-	0.0%	-	0.0%	15	0.0%	13	0.1%	28	0.0%
Health Care and Social Assistance	75	0.6%	38	0.3%	49	0.2%	48	0.4%	210	0.3%
Arts, Entertainment, and Recreation	-	0.0%	-	0.0%	196	0.6%	41	0.3%	237	0.3%
Accommodation and Food Services	75	0.6%	12	0.1%	398	1.3%	115	0.9%	600	0.9%
Other Services (except Public Admin.)	76	0.6%	32	0.3%	131	0.4%	430	3.3%	669	1.0%
Public Administration	29	0.2%	-	0.0%	5	0.0%	-	0.0%	34	0.1%
No NAICS	3,270	25.9%	1,920	16.6%	7,601	24.7%	1,338	10.3%	14,129	20.8%
TOTAL	**12,612**	**100%**	**11,545**	**100%**	**30,761**	**100%**	**12,984**	**100%**	**67,902**	**100%**

4. Job Tax Credit Programs in Other States

Many states have JTC programs, but sources vary as to the number of such states. Pennsylvania's Independent Fiscal Office (2019) lists 25 states as having broad-based JTC programs, Maryland's Department of Legislative Services (2016) reports the number at 33 states, and Burnett and Chi (2011) report that in 2010, 45 states offered JTC incentives. Rendziperis (2022) of the Site Selection Group lists 41 states as having JTC programs.

In this section we provide brief descriptions of JTC programs in 10 neighboring but not necessarily bordering states. The information was obtained from state websites and was not reviewed by officials in these states. We consider only job tax credit programs that are entitlements, i.e., eligibility is based on some given criteria and not at the discretion of some agency or official. However, in some states, a state agency must approve a firm's eligibility before it can take the tax credit. Some states have more than one job tax credit program. We do not include programs that are limited to certain types of employees, such as former welfare recipients or recently unemployed workers.

Three states, Arkansas, Mississippi, and South Carolina, have JTC programs that are relatively similar to Georgia's job tax credit program. Like Georgia, these three states restrict eligibility to certain industries and require that a minimum number of jobs be created. In Arkansas and Mississippi, the credit amount is a percentage of the increase in aggregate wages, and not a fixed dollar amount per job as in Georgia and South Carolina. Some of the other 10 states require a minimum capital investment, limit eligibility to firms located in certain counties or of a given minimum size, limit the state aggregate value of tax credits that can be awarded in the state, or have other conditions that must be met for a firm to be eligible.

ALABAMA

Enterprise Zone Program
The Alabama Enterprise Zone Program offers a maximum credit of up to $2,500 per new permanent employee in a facility located in an Enterprise Zone county. The value of the credit is determined by several factors, such as the capital investment made. An Enterprise Zone County has a population of 50,000 or less, or 1) has experienced negative population growth over the last five years and 2) contains no more than two Opportunity Zones as they existed on June 1, 2019. Of the state total of 67 counties, there are 45 designated as Enterprise Zones. The credit can be earned in any of three ways: if at least 30 percent of new employees were formerly unemployed for at least 90 days; if the firm makes an investment and hires at least 5 new employees; and the firm can earn up to $1,000 in tax credits for providing skill training for the new workers.

Full Employment Act Tax Credit
The Full Employment Act offers a one-time tax credit of $1,000 to small businesses for each new job paying more than $10 per hour. A small business is defined as a business that employs 50 or fewer employees as of June 9, 2011. The tax credit is available in the tax year in which the newly hired employee completes 12 months of consecutive employment.

ARKANSAS

Advantage Arkansas
Arkansas' job-creation incentive program is based on payroll and uses a tier system. Each year, counties are assigned to one of four tiers based on the poverty rate, the unemployment rate, per capita personal income, and population growth.

Advantage Arkansas offers a state income tax credit for job creation based on the payroll of new, full-time, permanent employees hired. The required increase in payroll varies by tier, from $50,000 (tier 4) to $125,000 (tier 1). The tax credit is a percentage of the increase in payroll, with the percentage varying from one percent (tier 1) to 4 percent (tier 4). Qualified businesses receive an additional tax credit of one percent of payroll if the new employees' average hourly wage exceeds 125 percent of the lesser of the state or county average wage. To qualify for the Advantage Arkansas program (all tiers), the proposed average hourly wage of the new employees hired currently must be equal to or greater than $14.11.

The Advantage Arkansas income tax credit is earned each tax year for a period of five years. The income tax credit cannot offset more than 50 percent of a business' income tax liability in any one year and may be carried forward for nine years beyond the tax year in which the credit was first earned.

FLORIDA

Florida has two job tax credit programs. The tax credits can be taken against either the Florida Corporate Income Tax or the Florida Sales and Use Tax. (Note that Florida does not have a personal income tax.) For both programs tax credits are granted on a first come, first served basis until the maximum amount of credits allowed per calendar year have been exhausted.

Rural Job Tax Credit Program
The Rural Job Tax Credit Program offers a job tax credit of $1,000 per new employee for eligible businesses located within one of 36 designated Qualified Rural Areas. The employment required for eligibility differs by type of business. New businesses must have 10 qualified employees. Existing firms with fewer than 50 employees must increase employment over the prior year by 20 percent, while larger firms must increase their employment by at least 10 qualified workers.

Urban High-Crime Area Job Tax Credit Program
The Urban Job Tax Credit Program offers a job tax credit for eligible businesses located within one of the 13 designated urban areas. The size of the credit and the required minimum increase in employment vary by tier as noted in Table 8. Tiers are based on type and rate of crimes.

Table 8. Required Employment and Credits for Florida's Urban JTC Program

Tier	Minimum # of New Employees	Credit per Employee
New Businesses:		
I	10	$1,500
II	20	$1,000
III	30	$500
Existing Businesses:		
I	5 more than previous year	$1,500
II	10 more than previous year	$1,000
III	15 more than previous year	$500

KENTUCKY

The Kentucky Small Business Tax Credit Program
Under the Kentucky Small Business Tax Credit program, businesses with 50 or fewer full-time employees are eligible for a tax credit if they have hired and sustained at least one new job in the last year and purchased at least $5,000 in qualifying equipment or technology. The program is open to nearly all industry segments, including retail and service. The new employee must earn a wage that is at least 150 percent of the federal minimum wage.

The tax credit is the lesser of $3,500 times the number of eligible positions added, or the dollar amount invested in qualifying equipment or technology. A firm's total credit is subject to a maximum of $25,000 for each calendar year.

There is a statutory cap of $3 million in total tax credits that can be funded per year (the total is shared with the Kentucky Selling Farmer Tax Credit program).

LOUISIANA

Louisiana Quality Jobs Rebate
The Quality Jobs Rebate program provides an annual cash rebate equal to a percentage of the annual gross payroll for new direct jobs for up to 10 years. There are several alternative sets of conditions that a business can satisfy to be eligible:

- Being a COVID-19 impacted retail business, hotel, or restaurant, that has no more than 50 employees nationwide.
- Being in Bioscience, Manufacturing, Software, Clean Energy Technology, Food Technology, Advanced Materials, Headquarters of Multi-State Businesses, Aircraft MROs, or Oil & Gas Field Service.
- Having at least 50 percent of annual sales to out-of-state buyers, to in-state customers or buyers if the product or service is resold by the purchaser to an out-of-state customer or buyer, or to the federal government.
- Spending fifty percent or more of its time performing services for its out-of-state parent company.

- Being located in a parish that is within the lowest 25 percent of parishes based on per capita income.

The minimum number of new jobs required varies with the size of the business. If an employer has 50 or fewer employees state-wide, it must create at least 5 new jobs with an annual payroll of at least $225,000. If the employer has 51 or more employees state-wide, it must create at least 15 new jobs with an annual payroll of at least $675,000. The jobs must be full-time and provide a basic healthcare plan.

The rebate is 4 percent if the wage rate is at least $18 per hour, and 6 percent if the wage rate is at least $21.66 per hour.

MISSISSIPPI

Jobs Tax Credit
The Jobs Tax Credit program provides an income tax credit equal to a percentage of the payroll for new jobs each year for a 5-year period. The minimum number of new jobs that must be created and the credit value varies by tier. In Tier I counties (the developed counties) the minimum number of jobs that must be created is 20 and the credit equals 2.5 percent of the payroll of the new jobs. The corresponding parameters for Tier II counties (moderately developed counties) are 15 new jobs and 5 percent of the payroll, and those for Tier III counties (less developed counties) are 10 new jobs and 10 percent of the payroll.

Each year all counties are assigned to one of three tiers based on the county's unemployment rate and per capita income. Each tier contains one-third of the counties.

Eligible businesses include manufacturers, processors, distributors, wholesalers, research and development, and warehouses. Other businesses are eligible but require a designation from the state prior to taking the jobs tax credit; these include air transportation and maintenance facilities, movie industry studios, telecommunication enterprises, data or information processing, computer software developers, any technology intensive facility, recreational facilities that impact tourism, and final destination or resort hotels with more than 150 guest rooms.

The total of the jobs tax credit and other economic development incentive tax credits is limited to fifty percent of the firm's state income tax liability. Unused credits may be carried forward for five years.

NORTH CAROLINA

The tax credit program for creating jobs was repealed effective for business activities that occurred on or after January 1, 2014.

SOUTH CAROLINA

Jobs Tax Credit
The conditions for eligibility of the Jobs Tax Credit vary by industry and county tier. There are four tiers, with designation based on unemployment rates and per capita income.

The number of new jobs is calculated as the increase in the average monthly employment from one year to the next. For firms in most industries, the firm must create a monthly average of 10 net new jobs. However, for qualified service-related facilities the following criteria have to be met:

- In a Tier IV county, service facilities must create a monthly average of 10 net new jobs to qualify.
- In a Tier I, II, or III county, service facilities must create in a single taxable year a monthly average of:
  - 175 new jobs,
  - 150 new jobs in a building that has been vacant for at least 12 months,
  - 100 new jobs with an average salary 1.5 times the lower of the state or the county per capita income,
  - 50 new jobs with an average salary two times the lower of the state or the county per capita income, or
  - 25 new jobs with an average salary 2.5 times the lower of the state or the county per capita income.

For each new eligible full-time job created the tax credits are equal to the following amounts per job, per year, for up to five years:

- Tier I ($1,500)
- Tier II ($2,750)
- Tier III ($20,250)
- Tier IV ($25,000)

A county may join with another county to form a "multi-county industrial park." This partnership raises the value of the credits by $1,000 per job.

Small Business Jobs Tax Credit
If the company is a manufacturing, processing, warehousing and distribution, research and development, agribusiness, or qualified technology intensive facility, or a corporate office that has fewer than 99 employees worldwide, the company could qualify for the Small Business Jobs Tax Credit. This requires creating a monthly average of two net new jobs, instead of 10. The credit amount is the same as for the Jobs Tax Credit for net new jobs that pay 120 percent of the county's average hourly rate. For jobs that pay less than 120 percent of the county's average hourly wage rate, credits range from $750 to $12,500 per job (or $1,750 to $13,000 in a multi-county industrial park).

TENNESSEE

Job Tax Credit
A standard job tax credit equal to $4,500 for each qualified job is provided to firms meeting the eligibility criteria. The firm must be a qualified business enterprise, make a capital investment of at least $500,000 within three years (five years in a tier 3 or 4 enhancement county), and create a minimum number of qualified jobs from the investment. Qualified business enterprises are new or expanding businesses in specified industries, including manufacturing, distribution, research and development, computer services, aircraft repair, and others, as well as those creating certain high-skill, high-wage jobs. The minimum number of qualified jobs that must be created from the investment are:

- 25 jobs in a tier 1 or 2 county,
- 20 jobs in a tier 3 county, or
- 10 jobs in a tier 4 county.

There are 16 Tier 1 counties, 18 Tier 2 counties, 25 Tier 3 counties, and 33 Tier 4 counties; tiers are based on county per capita income and the number of dislocated workers relative to statewide averages. Taxpayers must submit a Job Tax Credit Business Plan and receive tentative approval before any credit may be taken.

The standard job tax credit may offset 40 percent of the taxpayer's franchise and excise taxes in tier 1 counties and 50 percent in other counties. Unused standard job tax credits may be carried forward up to 15 years. (Note that Tennessee does not have a personal income tax.)

Community Resurgence Jobs Tax Credit
The Community Resurgence Jobs Tax Credit is an additional credit that may be claimed against franchise and excise tax when ten or more jobs are created in a high-poverty area.

Enhanced Job Tax Credit
The Enhanced Job Tax Credit allows an additional annual credit for locations/expansions in designated Tier 2, Tier 3, and Tier 4 counties. The value of the credit and the requirements for eligibility differ by tier. For Tier 2, a 3-year annual credit of $4,500 per job is provided if the firm creates at least 25 net new positions within 36 months. For Tier 3, a 5-year annual credit of $4,500 per job is provided if the firm creates at least 20 net new positions within 60 months. For Tier 4, a 5-year annual credit of $4,500 per job is provided if the firm creates at least 10 net new positions within 60 months. Firms must also invest at least $500,000 in a qualified business. There is no carry forward for this credit. Enhanced Job Tax Credits can offset up to 100 percent of a firm's franchise and excise tax liability.

WEST VIRGINIA

Economic Opportunity Tax Credit
West Virginia's Economic Opportunity Tax Credit program allows a tax credit if a firm invests in a new or expanded business facility. The credit equals the investment times a "New Jobs Percentage", which varies based on the number of new jobs created, but only between broad

ranges. The "New Jobs Percentage" equals 30 percent if the expansion creates at least 520 new jobs, 25 percent if the expansion creates at least 280 jobs but fewer than 520, and 20 percent if it creates fewer than 280 but at least 15 (or 10 for small businesses) new jobs. Thus, this program does not work like a more standard job tax credit program that assigns a credit amount per job or a percent of new wages paid. Instead, for a given investment, the tax credit would not be any greater if, as an example, the firm added 400 jobs rather than 280 jobs. If the firm creates fewer than 15 (or 10 for a small business) new jobs, the firm is not eligible for this tax credit.

Qualified businesses are those engaged in the activities of manufacturing, information processing, warehousing, non-retail goods distribution, qualified research and development, the relocation of a corporate headquarters, or destination-oriented recreation and tourism.

Economic Opportunity Tax Credit for Jobs Creation
If the investment of an otherwise qualified business creates fewer than 15 new jobs, or fewer than 10 new jobs for a qualified small business, a $3,000 credit is allowed per new full-time job for five years, provided that the new job pays at least $39,650 per year and the employee has employer provided health insurance benefits.

5. The Effects of JTC on Job Creation: Studies of Georgia's Job Tax Credit Program

There is a significant academic literature exploring the causal effect on job creation of state JTC programs. Three of these studies estimate the effect of Georgia's job tax credit program on job creation. In this section we review these three studies; studies of JTC programs in other states are discussed in Appendix C.

To measure the causal effect of a program, the ideal approach would be to randomly assign credit-eligible firms to the treated and control (non-treated) groups. Since it is not feasible to randomly assign firms to the treated and control groups, researchers use other methods that allow the estimates to be considered as being causal.

Faulk (2002) used administrative data from the Georgia DOR and the Georgia Department of Labor (DOL) to assemble data on 70 firms that took a job tax credit between 1993 to 1995, which is the treated group, and 81 firms that Faulk determined to be eligible for a job tax credit over the same period but that did not take a job tax credit, which is the control group. Simply comparing the growth in employment per firm, she reports that firms that did not participate in the job tax credit program created more jobs on average than firms that did participate. However, the firms in the two groups were not randomly assigned to treated and control categories.

To account for the nonrandom assignments to the treated and control groups Faulk estimates a switching regression model. The model is comprised of three regression equations. The first two equations – one for the treated firms and one of the control firms – estimate employment as a function of a set of explanatory variables. The third equations accounts for firms choosing whether to participate in the JTC program, and thus accounting for the non-random assignment to the treated and control groups.

Her empirical results imply that between 23.5 percent to 27.6 percent of the jobs for which a credit was earned were created due to the job tax credit. There are limitations to Faulk's analysis;

in particular, she has only three years of data and a very small and non-representative sample of firms. In addition, the data used for the study is now over 25 years old and much has changed in the Georgia economy.

A second Georgia-specific study is by Kuehn (2016), who makes use of the variations in the value of job tax credits across Georgia's 159 counties. Kuehn uses a regression discontinuity design (RDD) model, which assumes that the counties just above and just below the cutoff for assignment to a tier are similar, i.e., that the counties can be considered as being randomly assigned to be just above or just below the cutoff. This assumption is based on the fact that the values of the variables used to rank counties differ very little between counties just above and below a cutoff. Furthermore, these variables are measured with some error, so the value of these variables can be considered random. Thus, while he cannot randomly assign values of the job tax credit to counties, the process for determining tier status results in a quasi-random assignment. Therefore, comparing employment in counties just above and just below the cutoff leads to an estimate that can be considered causal.

Kuehn used annual county-level data for the period 2001 to 2014. He has four alternative dependent variables, including total employment, new hires, average annual earnings for existing employees, and annual earnings for new hires. He estimates several variations of the model. None of Kuehn's estimates show a positive effect of job tax credits on employment or earnings. A limitation of Kuehn's analysis is that he does not distinguish between employment in industries eligible for a job tax credit and in other industries.

The third Georgia specific study is by Gurmu, Sjoquist and Wheeler (2021) and provides estimates of the casual effect of Georgia's job tax credit on county employment. The authors created a panel data set of Georgia's counties for the period 2000 through 2015 using state administrative employment records. Unlike Kuehn, they are able to measure county employment in industries eligible for a job tax credit.

The authors use three different empirical approaches. First, like Kuehn (2016), they use a regression discontinuity design model, estimating several variations of their basic RDD model. Their second approach exploits the many changes in the value of a county's job tax credit to estimate the change in county employment due to the change in the value of the job tax credit. For this approach they first use the changes in county tier designations between 2000 and 2001 resulting largely from legislative changes to the job tax credit program. They then use annual changes in county tier designations for the 2001-2015 period. The estimated effect of the change in the value of the job tax credit on the change in employment can be considered causal if the changes in tier designation are caused by factors other than by the change in employment.

For their third approach, the authors compare employment in bordering census tracts that qualify for tax credits of different value. Under the assumptions that neighboring census tracts face the same economic environment other than the value of job tax credits, the division into treated and control areas occurs in an as-if random fashion.

In summary, Gurmu, Sjoquist, and Wheeler find little support for the hypothesis that JTC programs cause an increase in net employment. The results from the regression discontinuity

model provide no support for the hypothesis, results that hold up in numerous robustness checks, including using data for an earlier period when the tax credit program was structured somewhat differently. The second approach provides little support for the hypothesis. While the signs on the coefficients on the variable measuring the job tax credit for some of the regressions are consistent with the hypothesis, the coefficients are generally not statistically significant. The results for the third approach are contrary to the hypothesis. In summary, Gurmu, Sjoquist, and Wheeler conclude that their results provide little to no support for the hypothesis that JTCs have a positive effect on employment.

6. Georgia Employment

In this section we provide a description of Georgia's private sector nonfarm employment. Table 9 shows the level and growth of employment between 2000 and 2020 (the latest year for which these data are available).[4] Over the 20 years, private nonfarm employment in Georgia increased 28.60 percent. This compares to 23.19 percent for the 10 states considered in Section 4 and 17.76 percent for the United States. For the period, Georgia's employment grew in 15 of the 20 years. The last column shows the growth rate in the other 10 states. In almost every year in which Georgia employment grew, the employment growth rate was larger in Georgia than in the other 10 states. However, in years in which employment fell in Georgia, the percent decrease was larger for Georgia than the other 10 states. The same pattern is evident when comparing Georgia to the United States.

[4] These data are produced by the U.S. Bureau of Economic Analysis. The U.S. Bureau of Labor Statistics also publishes state employment data. The data in the two series differ; for discussion of the difference see https://www.bea.gov/help/faq/104.

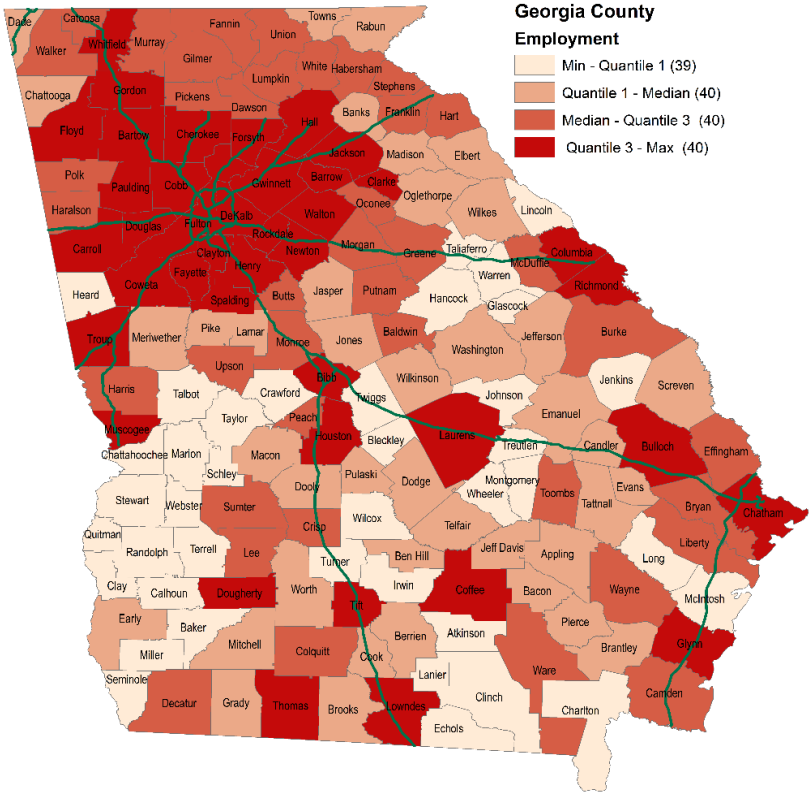
Table 9. Georgia Employment: Level and Growth

Year	Employment*	Growth	Growth Rate	Comparison States Growth Rate
2000	4,098,580			
2001	4,098,709	129	0.00%	-0.25%
2002	4,070,648	-28,061	-0.68%	-0.01%
2003	4,098,979	28,331	0.70%	1.05%
2004	4,218,062	119,083	2.91%	2.85%
2005	4,378,090	160,028	3.79%	3.09%
2006	4,530,156	152,066	3.47%	2.84%
2007	4,646,898	116,742	2.58%	2.24%
2008	4,585,676	-61,222	-1.32%	-1.20%
2009	4,391,429	-194,247	-4.24%	-4.09%
2010	4,363,565	-27,864	-0.63%	-0.49%
2011	4,490,609	127,044	2.91%	2.58%
2012	4,555,037	64,428	1.43%	1.69%
2013	4,675,350	120,313	2.64%	2.07%
2014	4,854,576	179,226	3.83%	2.90%
2015	5,014,623	160,047	3.30%	2.84%
2016	5,146,366	131,743	2.63%	2.22%
2017	5,288,967	142,601	2.77%	2.29%
2018	5,454,368	165,401	3.13%	2.82%
2019	5,557,621	103,253	1.89%	1.17%
2020	5,492,867	(64,754)	-1.17%	-1.53%
2021	5,714,128	221,261	4.03%	3.78%

Source: Bureau of Economic Analysis, Table SAEMP25N
* Private sector nonfarm employment.

Map 4 shows private nonfarm employment by county for 2019 and Map 5 shows the growth rates between 2014 and 2019. Both maps show the data by quartile. The ranges for Map 4 quartiles are: 327 – 2,989; 3,010 – 7,733; 7,738 – 20,262; 20,802 – 1,088,510. The ranges for Map 5 quartiles are: -30.64% – 2.14%; 2.60% – 10.61%; 10.73% – 19.14%; 19.26% – 72.65%. Table D1 in Appendix D contains the values by county. We picked 2019 as the ending year for these two maps because employment in 2020 was heavily affected by COVID and thus may not representative. The average growth in the number of jobs was 4,420; growth ranged from -1,050 to 167,089. The average growth rate was 11.85 percent; the growth rate ranges from -30.64 percent to 72.65 percent. There were 25 counties that had a decrease in employment and 16 counties with an increase of fewer than 100 jobs.

Map 4. Georgia County Employment, 2019



Map 5. Georgia Job Growth Rate, 2014-2019

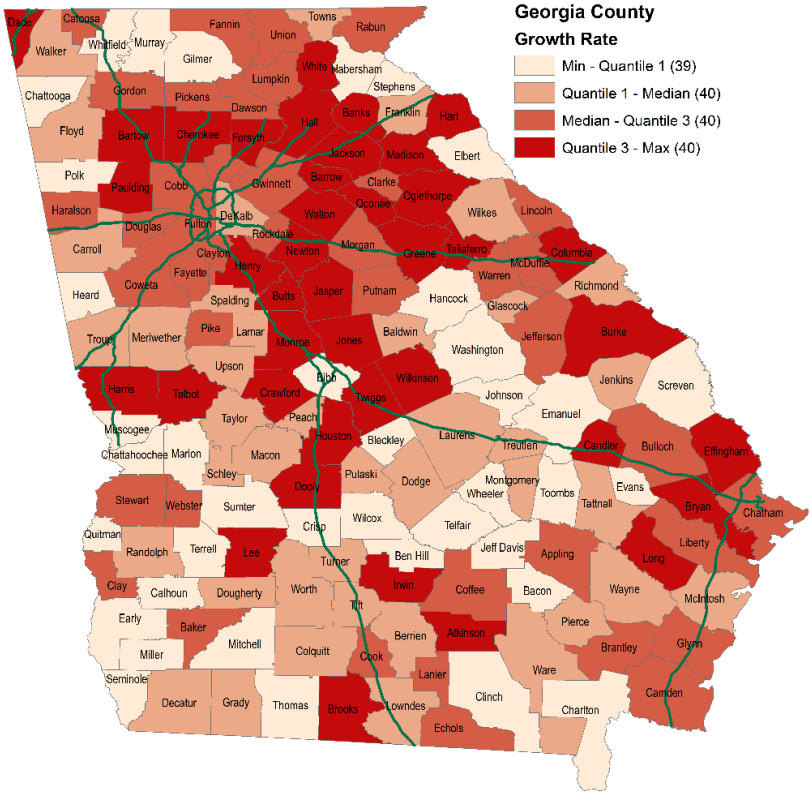


Table 10 shows the distribution of private sector nonfarm employment by industry for 2019, along with employment growth and growth rates over the 2014-2019 period. Retailing is the largest sector, while transportation and warehousing had the largest growth and growth rates. There were four sectors that had decreases in employment.

Table 10. Georgia Private Nonfarm Employment by Industry

Industry	Employment* 2019	Growth (2014-19)	Growth Rate (2014-19)
Retail trade	606,226	35,760	6.27%
Healthcare and social assistance	598,618	73,897	14.08%
Administrative and support and waste management and remediation services	521,757	61,733	13.42%
Accommodation and food services	491,542	72,191	17.21%
Professional, scientific, and technical svcs	438,665	54,540	14.20%
Manufacturing	430,522	41,665	10.71%
Other services (except government and government enterprises)	405,153	43,042	11.89%
Construction	352,285	67,617	23.75%
Transportation and warehousing	347,056	112,806	48.16%
Finance and insurance	299,050	28,904	10.70%
Real estate and rental and leasing	276,931	37,545	15.68%
Wholesale trade	237,036	-1,729	-0.72%
Information	137,929	8,966	6.95%
Educational services	135,141	15,828	13.27%
Arts, entertainment, and recreation	125,860	21,003	20.03%
Management of companies and enterprises	99,447	31,829	47.07%
Forestry, fishing, and related activities	25,223	-585	-2.27%
Utilities	20,694	-52	-0.25%
Mining, quarrying, oil and gas extraction	8,244	-2,157	-20.74%
Total	**5,557,379**	**702,803**	**14.48%**

Source: Bureau of Economic Analysis, Table SAEMP25N
* Private sector nonfarm employment

Using Unemployment Security data from the Georgia DOL, we generated estimates of the number of jobs that establishments added between 2018 and 2019 that would be eligible for a Georgia job tax credit. We used 2018-2019 because employment was so heavily impacted in 2020 and 2021 by COVID. We are able to measure the change in employment for establishments by county and NAICS code. However, about 20 percent of the establishments in the file do not have NAICS codes, so our estimate likely understates the number of new jobs that might be eligible for a Georgia job tax credit. Furthermore, establishments might report NAICS codes to the Georgia DOL that incorrectly suggest that the establishment is or is not eligible for a job tax credit. In addition, we are unable to determine if an establishment is located in a specially designated area that would require fewer jobs for eligibility than in the rest of the county. We are

unable to combine employment across establishments in a given county for multi-establishment firms, which leads to an underestimate of JTC eligible jobs.

Nonetheless, we calculated estimated new credit-eligible jobs by tier, as shown in Table 11. The bulk of the new jobs were created in Tier 3, which is also the case for credited jobs (Table 4). We also report the number of establishments that are eligible; 61.4 percent are in Tier 1. We estimate that 28.8 percent of credit-eligible jobs were in the manufacturing sector. Comparing state total of new jobs reported in Table 4 to the total in Table 11 implies that about 45 percent of new creditable jobs earn a job tax credit. However, given that total jobs reported in Table 11 is estimated with error this percentage is also subject to error.

Table 11. Estimated Job Tax Credit Eligible Job, 2019

Tier	Estimated New Jobs	Share of Total New Jobs	Number of Establishments	Share of Total Establishments
1	8,242	16.5%	1,309	61.4%
2	5,168	10.4%	135	6.3%
3	26,118	52.4%	510	23.9%
4	10,273	20.6%	179	8.4%
Total	**49,801**	**100.0%**	**2,133**	**100.0%**

Using the Unemployment Security data, we can also estimate the number of new jobs that are still in place after 5 years. To do that we identified credit-eligible establishments in 2014 and the number of new jobs they created between 2013 and 2014. We then calculated the change in employment in these establishments between 2014 and 2019. We estimate that 48,325 new credit-eligible jobs were created between 2013 and 2014. Of these jobs, 22,564, or 46.7 percent, were lost by 2019 due to reduction in employment in these establishments.[5]

7. Development Objectives and Societal Benefits

Objectives of Economic Development Incentives

Many potential objectives of, or justifications for, economic development incentives have been suggested in the literature. The principal objective is thought to be to spur desirable economic development and attract and retain good jobs. Objectives beyond economic growth or job creation include spreading economic activity throughout the state, increasing the presence of high-value industries, and increasing equity, either by improving economic conditions in the most distressed places or by improving the well-being of underemployed and low-income workers.

Societal benefits and costs of JTC programs

Increasing the level and improving the distribution of societal wellbeing are benefits of economic development incentives (Courant, 1994; Partridge and Rickman, 2006). The following are

[5] For any establishment, the number of lost jobs was capped at the number of jobs created between 2013 and 2014.

potential benefits and costs that might accrue as a result of a JTC program. Measuring these benefits is very difficult and beyond the scope of this report.

Increased employment

- Moving an individual from involuntary unemployment or underemployment (i.e., earning less than the amount associated with a worker's skill level) to full employment is a benefit. The benefit is not the wage earned since the individual has an opportunity cost for the time spent working (Jones 1989). Rather, the benefit is the individual's wellbeing when employed less the wellbeing if unemployed. This would be measured by the amount the individual would be willing to pay to be fully employed rather than involuntarily unemployed or underemployed. Furthermore, if an individual needed to move to another labor market in order to obtain employment, a benefit of a job created as a result of a job tax credit would be the elimination of the cost and disruption of such a move.
- A JTC may reduce the time that an individual would expect to be unemployed. If the individual would be unemployed for, say, 6 weeks without the job tax credit program, the benefit would be less than if the individual is expected to be unemployed for 6 months without the job tax credit program. In other words, the longer the individual would expect to wait to become employed in the absence of a JTC program, the greater the benefit. Furthermore, the better the new job, i.e., the more secure it is and the higher the wage, the greater the benefit.
- From the state's point of view, these benefits would normally be counted only if the hired worker is a state resident. Thus, if the new job is taken by a migrant, that would not normally be considered a benefit to the state.

Spillover benefit of new jobs

- Research has found that the loss of jobs leads to an increase in mortality and morbidity, and to increased risk of violent behavior. To the extent that new jobs would reduce those outcomes, society benefits.
- To the extent that new jobs are located in areas where the involuntary unemployment rate is high, society benefits from the reduced inequality.
- If additional employment increases population in a jurisdiction, the local government benefits to the extent that there are economies of scale in providing local public services.
- An increase in employment and population could change a community's characteristics. To the extent that these changes are considered desirable, society benefits. Of course, changes in a community's characteristics might be considered a negative. For example, an increase in employment and population could lead to increased congestion and environmental degradation.
- An increase in employment and the corresponding increase in income reduces the need for unemployment insurance and other social services, reducing government cost. The benefit would be the difference in the benefit from the new use of the revenue and the reduction in spending on unemployment insurance and other social services.
- If the increased employment requires new public infrastructure, that is a cost of the new jobs.

Increase in government revenue
The increase in employment and earnings will likely increase government revenue. While this is a positive outcome from the government's perspective, it is not a benefit from society's perspective. The increase in output or income is the societal benefit. How the increase in income is allocated, whether it is an increase in tax revenue or spending on automobiles, is not relevant to measuring social benefits.

Increase in property values
The increase in income and population might result in an increase in property values because of the resulting increase in demand for property. Property owners might consider this a personal benefit. But the increase in property values is not a benefit to society since it is completely offset by the increased cost of using the property.

Costs of JTC
In addition to the cost of the job tax credits and the administrative costs of the JTC program, other costs include potential distortions to the economy. JTC provides an incentive to use more labor relative to capital than what might be economically optimal. Furthermore, incentives reduce taxes for qualifying firms, meaning that other activities and businesses must pay higher taxes, which is an equity issue.

8. Estimating the Economic and Fiscal Effects of a JTC

Estimating the economic effect of a Job tax credit program involves addressing two main questions. First, how many jobs were created as a direct result of the JTC program? Second, what are the economic and fiscal effects of these new jobs on the state?

The answer to the first question must account for the "but for" question, i.e., how many of the new jobs for which firms take a job tax credit would not have been created in the absence of the job tax credit? The effect of a JTC on a state's economy depends on the number of jobs for which the JTC was decisive in creating jobs, not the number of jobs that earn a tax credit. Thus, it is necessary to measure the number of the jobs that would not have been created "but for" the job tax credit.

A firm might expand its labor force in response to several possible factors, including job tax credits. But there are other reasons why a firm will increase employment, including an increase in the demand for its product or service. Thus, we expect that only a percentage of the increase in a firm's employees are hired because of the job tax credit. Later in this section, we explore the percentage of new jobs for which the job tax credit is decisive.

The second question concerns the subsequent effects on the state's economy and government revenue and expenditures from the jobs created because of the job tax credit. These effects include jobs, income, and government revenues and expenditures. These effects are generally estimated using existing empirical modelling software, such as IMPLAN (Impact Analysis for Planning) or REMI (Regional Economic Models Incorporated). We use IMPLAN. These calculations are discussed in Section 10.

There are a few studies that use a somewhat different approach to estimating the effects of JTC than we use, i.e., they use a simulation model. Rather than using an estimate of the "but for" percentage, these studies use estimates of the elasticity of employment with respect to net wage or to taxes.[6] One can model the JTC program as the reduction in the net wage that the firm must pay to new workers or as the reduction in the firm's effective tax rate. Multiplying the percentage change in net wage rate or in the effective tax rate by the appropriate elasticity yields an estimate of jobs created as a result of the JTC. This calculation is then generally incorporated into an empirical model that provides estimates of the total economic effects. We review two such studies below, Luger and Bae (2005) and Bartik and Erickceh (2014). More detailed stimulation models can be found in Hoyt, Jepsen and Troske (2009), who consider the Kentucky JTC program; Anderson Economic Group, LLC (2016), which considers the Tennessee JTC program; and the report analyzing the Louisiana Quality Jobs program by the Louisiana Legislative Auditor (2020).

Summary of Results

Tables 12 and 13 summarize our findings; details are presented in subsequent sections. The first panel of Table 12 shows the estimates of the economic effect on Georgia from new jobs under alternative assumption regarding the percentage of credited jobs for which the JTC is decisive. We first derive estimates of the economic effect under the assumption that job tax credits were decisive for 100 percent of jobs that earned a job tax credit (first row).

The values in the first row do not measure the economic effects of Georgia's JTC program because Georgia's JTC program was not decisive for 100 percent of the jobs that earned a job tax credit, i.e., all 22,668 new jobs. As discussed below, we adopt two alternative assumptions regarding the percentage of credited jobs for which the JTC program is decisive, namely 5 percent and 11.4 percent. The economic effects for these two decisive percentages are found in the second and third rows of Table 12. The last row shows the economic effects of spending $65.9 million, the costs of the tax credits and administration of the program, on general state services rather than on job tax credits.

Table 12. Total Economic Effect of New Jobs

($ *millions*)	**Employment**	**Labor Income**	**Value Added**	**Output**
Assumed Decisive Percent:				
100% -- All Credited Jobs	50,954	$3,045.3	$5,300.2	$11,566.5
5% of Credited Jobs	2,548	$152.3	$265.0	$578.3
11.4% of Credited Jobs	5,809	$347.2	$604.2	$1,318.6
Alternative Use of Funds:				
Increase State Expenditures	1,771	$72.5	$88.0	$138.5

Table 13 presents the estimated effect on state and local revenues and the total cost of the JTC program. The first and second rows of Table 13 are estimates of the effects of Georgia's JTC

[6] The elasticity measures the percentage change in of employment that results from a one percent change in, say, the net wage. Estimates of this elasticity are available in Lichter, Peichl, and Siegloch (2015).

program on state and local tax revenue for the two alternative decisive percentages. The last column is the total cost to the state of the JTC program, which includes both cost of the tax credits and the administrative cost, and the third row presents the equivalent revenue estimates for increasing state expenditures by $65.9 million. It is clear that the cost of the JTC program far exceeds the increase in tax revenue.

Table 13. Estimates of Government Revenue

($ *millions*)	State Tax Revenue	Local Tax Revenue	Total Tax Revenue	JTC Program Cost
5% Decisive Percentage	$11.8	$9.4	$21.2	$65.9
11.4% Decisive Percentage	$26.9	$21.3	$48.2	$65.9
Increase State Expenditures	$3.8	$1.6	$5.4	$65.9

The remainder of the report provides detailed explanations of the methods used to generate these estimates.

Factors Affecting the Percentage of New Jobs for Which a JTC is Decisive

The review of the literature in Section 5 and Appendix C suggests that the number of jobs created "but for" the job tax credit is small. To explain why that might be the case, consider the following. A firm would add a new worker if the tax credit were sufficient at the margin to warrant hiring another worker beyond what the firm would hire in the absence of the tax credit. However, Georgia's job tax credit is small relative to the wage rate. The maximum credit of $3,500 is 11.2 percent of the minimum wage that must be paid for a new job to be eligible, i.e., $31,304. On the other hand, the minimum credit of $750 is 2.4 percent of the minimum required wage. A tax credit of $3,500 is 5.4 percent of the mean earnings for a full time, year-round worker in Georgia of $64,175.

These calculations do not include the other costs associated with a new worker. First, there are fringe benefits. The Bureau of Labor Statistics (2019) estimates that for workers in goods producing industries, fringe benefits are 29.2 percent of total compensation, including supplemental pay. Second, a firm will incur costs associated with hiring new workers. Dube, Freeman and Reich (2010) report that the median cost of hiring a worker is $1,928 for a blue-collar worker and $7,051 for a professional worker. Furthermore, over a 5-year period, a firm may have to replace the worker due to turnover. Farber (1999) reports that 50 percent of new full-time employees leave in one year, and an additional 17 percent leave in the second year, either because the worker quits or was dismissed. These rates do not differ much across occupations. On average a firm can expect to have to hire 2.8 workers over the 5-year period for one new position. Assuming a hiring cost of $1,928, the expected total cost of hiring the worker would be $5,398. Adding an additional worker could also require adding additional capital. For some occupations the additional capital will be minor, for example, the tools for a carpenter, while for other occupations the additional capital can be large, for example, a backhoe for a construction worker. The new worker might also require adding or reconfiguring workspace.

JTC programs have reporting requirements for the firm, but there is no reported cost of these requirements. Katz (1998) and Ihlanfeldt and Sjoquist (2001) suggest that the regulatory burden, paperwork, and fear of an increased possibility of an audit might lead to low participation rates in JTC programs. However, recent correspondence with the Metro Atlanta Chamber of Commerce claims that the compliance costs are modest.

Under Georgia's JTC program in most tiers, the firm must apply the tax credit against the firm's tax liability. If the firm has a small tax liability, then the tax credit might not be of much value to the firm. It is the case that many corporations do not have a state tax liability. For example, according to Georgia DOR for tax year 2021, 90 percent of corporate tax returns filed in Georgia reported taxable income of zero or less. This will likely also reduce the participation rate.

Firms are not likely to hire an additional worker unless there is sufficient demand for its product or service to warrant hiring an additional worker even if the net wage is reduced due a tax credit. It is generally assumed that in a competitive market, the new worker will produce output that will be sold. However, in a less competitive market the producer might have to discount the price in order to sell the additional output or might be able to sell only a percentage of the additional output.

Even if the job tax credit caused a firm to hire a new worker, it is not necessarily the case that the new job represents an increase in jobs in the state. New workers at a firm could have been non-employed residents, individuals employed at other firms, or new residents. If the new jobs are filled by previously non-employed or new residents, then the county employment would increase by this number of new jobs. However, if the new workers at a firm are hired away from other firms in the county, the county would experience no net increase in employment. There are studies that find that the opening of a new business does not always lead to a net increase in county employment. For example, Hicks (2007) studies the effect on county employment in seven U.S. counties that experienced the entrance between 1993 and 2003 of Cabela retail outlets, which are large-scale specialty retail stores. Hicks found that the entrance had no persistent effect on net employment. Similarly, Fox and Murray (2004) examine the location of large, mobile firms and conclude that it is most likely that large companies simply displace other sources of job and income growth in the regional economy.

Reported new jobs at an establishment might be the result of shifts in employment between establishments of a given firm, but with no increase in total state employment. If a Georgia firm shifted workers from one of its establishments to a second establishment in a different county, it would be illegal to claim a tax credit for the increase in employment in the second establishment. However, a firm might lay off workers at one establishment and expanded employment at the other establishment in another county, for example, as a result of consolidating production. In such a case, the firm could claim job tax credits for the expanding establishment even though state employment did not increase.

New jobs might be taken by migrants to the state, something that is relevant if the state is concerned only with an increase in employment of state residents. There is research on how local job growth is apportioned among new jobs for current residents vs. new residents (for a review of this literature, see Bartik 2012). This research suggests that in the short run, after a year or

two, between 50 and 80 percent of the new jobs go to increasing the employment rates of current residents, and the rest go to persons who otherwise would have lived elsewhere. Studies do find that the migration effect is larger in regions with higher mobility, such as the Sunbelt. And the conventional wisdom is that local effects are larger in local labor markets with high unemployment

Finally, consider a business that in the absence of a job tax credit might add a few workers each year for multiple years, but not enough to be able to claim a job tax credit in any given year. However, what the firm might do to qualify for a job tax credit is to bunch the hiring into one year. (The Anderson Economic Group (2016) found evidence of such bunching.) Similarly, a firm might consolidate its potential hiring in multiple counties to one county in order to qualify for a job tax credit. In both cases, the job tax credit incentivized the timing and placement of the new jobs but did not result in new hiring.

Estimates of the "But For" Assumption

Existing economic evaluation studies of JTC use one of two approaches to address the "but for" issue. First, some studies assume an elasticity of employment with respect to wages or to taxes. These studies then multiply the implied change in taxes or net wages as a result of the JTC by the wage or tax elasticity to estimate the change in jobs due to the JTC. Second, based on existing research, studies assume a given percentage of new jobs for which the job tax credit is decisive. The latter is the more common approach and the one we use. We discuss studies that use these two approaches in turn.

Luger and Bae (2005) estimate the employment effect of tax incentives in North Carolina by first estimating the change in net wage a firm pays as a result of the tax credit, and then multiplying the change in the net wage by alternative values for the labor elasticity of demand. They estimate that in 1999, North Carolina's job tax credit program resulted in 97 new net jobs. However, in 1999 there were 7,888 jobs that were awarded a job tax credit. Thus, the job tax credits were decisive for only 1.23 percent of the jobs that were provided a job tax credit.

Bartik and Erickceh (2014) use a similar approach to estimate the effect of the Michigan Economic Growth Authority (MEGA) credits, but they use published estimates of the responsiveness of employment to taxes rather than the responsiveness to net wage. They are implicitly assuming that employers' responsiveness to job tax credits is the same as the responsiveness to taxes more generally. They consider several different values of the elasticity of employment with respect to taxes. Their basic results imply that the MEGA credit is decisive for 8.25 percent of the jobs receiving a MEGA credit.

In most evaluation studies the percentage of credited jobs for which the JTC is decisive is chosen from a range of percentages found in the literature. Bartik (2006) estimates that a typical location incentive package is decisive for 3.7 percent of firms in choosing a location. In a subsequent paper, Bartik (2018) surveys 34 studies that provide estimates of the decisive percent. Bartik claims that 23 of the studies that he reviewed are positively biased, i.e., the methodology causes the estimates to overstate the effect, 4 are negatively biased, and 7 have an unbiased methodology. For the 7 unbiased studies, the average decisive percent is 6.7 percent while the

median is 3.4 percent. Bartik concludes that 11.4 percent is a reasonable upper bound of the estimates of the decisive percentage.

Some state evaluation studies report other ranges of the decisive percentage. The Nebraska Legislature Performance Audit Committee (2020) claims that the percent of jobs for which tax credits are decisive, as reported in academic studies, ranges from 12 percent to 25 percent and choose 12 percent as the decisive percent. A review of existing studies by Pennsylvania's Independent Fiscal Office (2019) finds that the percentage of new jobs for which the job tax credit is decisive generally ranges from 2 to 8 percent; the Pennsylvania study assumes a decisive percentage of 5 percent. Maryland also assumes a 5 percent rate (Maryland Department of Legislative Services 2016), while Rhode Island assumes a 25 percent decisive factor (Rhode Island Department of Revenue 2021).

9. IMPLAN Economic and Fiscal Impact Analysis

In this section, we model job creation activity to estimate the direct, indirect, and induced economic impacts of the new jobs created by the JTC program. Results reported here include estimates of employment, wages, value added, and total output associated with the three levels of economic impact. In addition, as explained further below, we use these economic impact estimates to produce estimates of tax revenue impacts at the state and local levels.

IMPLAN Model Overview

To estimate the economic impact of new jobs in Georgia, we use IMPLAN, a regional input-output model that is widely used for economic impact analysis. IMPLAN estimates how an initial change in employment for any industry category works its way through a regional economy, using data on input-output relationships between any industry and its suppliers and customers within or outside the given region, in this case the state of Georgia. It also has data on the size of each industry in the economy in terms of revenue and employment at the state and county level. The model uses sector multipliers to estimate the impact of the initial spending by firms on suppliers of goods and services to the sectors of interest, or on labor. This analysis uses IMPLAN model data for the year 2019, adjusted forward to represent average annual revenues and wages in 2021 dollars. Below is a discussion of the relevant IMPLAN terms used in the report.

- Direct effects are the changes that initiate the ripple effects through the economy. For purposes of this analysis, direct effects are increased firm output (revenue) directly attributable to the jobs created.
- Indirect effects are the economic activity supported by business-to-business purchases in the supply chain for firms. For example, a firm purchases raw materials and equipment needed. Each of the supplying businesses subsequently spends a portion of the money they receive on their own production inputs, which in turn prompts spending by the suppliers of these inputs. This spending continues but progressively diminishes in its in-state impacts due to "leakages," which occur when firms spend money on imports (including imports from other states), taxes, and profits.
- Induced effects are economic activity that occurs from households spending labor income earned from the direct and indirect activities. This activity results from household

purchases on consumption items such as food, housing, healthcare, and entertainment. The labor income spent to generate these effects does not include taxes, savings, or compensation of nonresidents (commuters) as these leave the local economy (leakage).

- Output is the value of production. This includes the value of all final goods and services, as well as all intermediate goods and services used to produce them. IMPLAN measures output as annual firm-level revenues or sales, assuming firms hold no inventory.
- We also report value added, which measures the contribution to state gross domestic product (GDP).
- Estimates of output changes resulting from construction activity or operations are then used to estimate state and local sales tax revenue.
- Labor income includes total compensation – wages, benefits, and payroll taxes – for both employees and self-employed individuals.
- Employment includes full-time, part-time, and temporary jobs, including the self-employed. Job numbers do not represent full-time equivalents, so one individual may hold multiple jobs.

Analysis Using all Credited Jobs

In this subsection we derive estimates of the economic effect on Georgia from new jobs under the assumption that all jobs that earned a job tax credit were the result of the job tax credit. However, as we have argued above, not all of these jobs were the result of, i.e., caused by, the JTC program, and thus the economic effect we report in this subsection is not the economic impact of the JTC program. The effect of jobs created as a result of the JTC program is reported below.

We conduct the analysis using JTC data for 2019. We selected 2019 rather than the more recent 2020 because of concerns that 2020 employment was affected by COVID. The number of new jobs used is 22,668 (see Table 3). Jobs are summed by the six-digit NAICS code associated with each firm. These six-digit NAICS sectors are converted to IMPLAN industry sector codes using the NAICS-to-IMPLAN crosswalk.

Not all firms in the DOR data set have an associated NAICS code. To address this, we first calculated for firms with NAICS codes the share of those jobs in each IMPLAN sector. We then allocated the jobs without NAICS codes to IMPLAN codes based on those shares.

We use the IMPLAN generated firm revenue per worker to estimate the sector level firm revenue associated with these jobs. It is this estimate of sector level firm revenue that is entered into IMPLAN for the 145 unique IMPLAN industry sectors. The economic activity associated with that firm revenue is shown in Table 14.

Table 14. The Economic Effects* of 22,668 New Jobs ($ *millions*)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	22,668	$1,450.3	$2,488.8	$6,453.2
Indirect Effect	14,411	$927.3	$1,542.6	$2,940.9
Induced Effect	13,876	$667.7	$1,268.8	$2,172.4
Total Effect	50,954	$3,045.3	$5,300.2	$11,566.5

* See subsection *IMPLAN Model Overview* for definitions of terms

10. Analysis of the Economic Effects of Georgia's JTC Program

The "But For" Assumption

The economic effects presented in Table 14 are the effects of 22,668 new jobs.[7] But these are not the economic effects of Georgia's JTC program because Georgia's JTC program did not create 22,668 new jobs. As discussed in Section 5 and Appendix C, most studies of the effect of JTC programs on employment find that these programs have little to no effect on job creation. This literature suggests that most of the jobs that are given a credit would have been created without the JTC program. To measure the economic effect of Georgia's JTC program we need to determine the number of credited jobs for which the JTC program was decisive.

The first part of Section 8 explains why the number of jobs that are generated by the JTC is likely to be a small percentage of the jobs that are given a tax credit. The second part of Section 8 contains a discussion of various estimates of the percentage of credited jobs that are likely to be the result of the tax credit. These are the jobs that would not have been created but for the tax credit. Most estimates of the percentage of credited jobs for which the job tax credit is decisive are less than 10 percent, and many are less than 5 percent. In a literature review, Bartik (2018) identified 7 studies that estimate the decisive percentage that are not positively or negatively biased. The median decisive percent of these studies is 3.4 percent. He identifies 11.4 percent as a reasonable upper bound of the estimates of the decisive percentage from these 7 studies. Published reports of the economic and fiscal effect of JTC programs in Pennsylvania and Maryland use 5 percent as the decisive percentage.

We follow the studies from Pennsylvania and Maryland and first assume a decisive percentage of 5 percent. This is consistent with the findings of Kuehn (2016) and Gurmu, Sjoquist, and Wheeler (2021) in their analysis of Georgia's JTC program. They find that Georgia's JTC program has little to no effect on job creation. For the upper bound of our estimate, we use 11.4 percent as suggested by Bartik (2018).[8]

[7] Due to the researcher judgment needed to assign jobs without sector identification, IMPLAN estimates the number of direct jobs created to be 20,711. If the actual sectors were known, IMPLAN would have generated an estimate that was closer to the DOR data generated count of 22,668. We use 22,668 jobs created for the direct effect as that represents actual job counts reported by DOR. The relatively small difference (about 8 percent) in the two numbers will not have a material effect on our estimates of economic impact, which relies on IMPLAN's estimates of total output and labor income, which remain unchanged.

[8] The Faulk (2002) estimates discussed earlier are not used here for several reasons. First, Bartik (2018) finds that the methodology employed likely biases the results upward. Second, the data relied on are now over 25 years old

Economic Effects of JTC Program

Assuming that the JTC program is decisive for 5 percent of the credited jobs, it follows that the JTC program created 1,133 new jobs. Table 15 contains the estimates of the economic effects of the new jobs attributable to Georgia's JTC program. These jobs generated an additional $322.7 million in new output. Total economic activity attributable to the JTC program includes the support for 721 indirect jobs and 694 induced jobs. The total economic activity supports 2,548 total jobs and generates $578.3 million in additional output.

Table 16 presents information equivalent to that in Table 15 but assuming that the JTC program is decisive for 11.4 percent of the credited jobs. In total at this level, 5,809 jobs are supported and an additional $1.32 billion in output is generated.

Table 15. Economic Effects of JTC Program at 5 Percent Decisive Rate ($ *millions*)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	1,133	$72.5	$124.4	$322.7
Indirect Effect	721	$46.4	$77.1	$147.0
Induced Effect	694	$33.4	$63.4	$108.6
Total Effect	2,548	$152.3	$265.0	$578.3

Table 16. Economic Effects of JTC Program at 11.4 Percent Decisive Rate ($ *millions*)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	2,584	$165.3	$283.7	$735.7
Indirect Effect	1,643	$105.7	$175.9	$335.3
Induced Effect	1,582	$76.1	$144.6	$247.7
Total Effect	5,809	$347.2	$604.2	$1,318.6

Opportunity Cost

The economic effects reported in Tables 15 and 16 do not account for the opportunity costs of the forgone state revenues, i.e., the economic impacts of alternative uses of the funds expended through the tax credits. Estimating net economic impacts requires consideration of the economic effects of alternative uses of the job tax credits expenditures. If Georgia did not fund the JTC program, it would have those funds available to spend in an alternative way, which would generate economic effects.

Alternative uses of the funds could include other economic incentives, spending on other policy areas across state government, or a reduction in taxes. These alternative expenditures also would result in direct, indirect, and induced economic effects. Absent information as to how the

and much has changed in the Georgia economy as well as the rules governing the JCT, since then. Thus, we believe the recent study by Gurmu, Sjoquist, and Wheeler (2021) is a better indicator of the current impacts the JCT is having on job creation.

General Assembly would otherwise choose to use foregone revenue, if not on job tax credits, we estimate the impact of using the revenue to fund an equivalent increase in state government spending generally, in proportion to existing expenditures. That is, we allocated the revenue used to fund the credits to industry sectors based on the sector shares of spending in the state budget. The two largest categories of spending – education (56.6 percent) and healthcare (22.5 percent) – account for roughly 79.1 percent of the budget (see Appendix E for more details).

The economic effects of spending the $65.6 million in job tax credits plus the administrative costs on other government programs is shown in Table 17. The direct effect shows that 1,312 jobs would be created in the designated sectors from the $65.9 million in Georgia state government spending. An additional 451 jobs would be supported based on indirect and induced effects. Total economic output would be $138.5 million. This is less than the output reported in Tables 15 and 16, which implies that $65.9 million in general state government spending would generate less economic effects than funding the JTC program.

Table 17. Alternative Use of JTC Expenditures Scenario ($ *millions*)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	1,318	$50.3	$47.0	$65.9
Indirect Effect	123	$6.3	$10.8	$20.9
Induced Effect	330	$15.9	$30.2	$51.7
Total Effect	1,771	$72.5	$88.0	$138.5

11. JTC Program's Fiscal Effects

In this section we present estimates of the fiscal effects of Georgia's JTC program, that is, the effect on government revenue less the cost of the JTC program. Table 18 shows the estimates of state and local government revenue that is generated by the economic effects reported in Tables 15, 16, and 17. Under the assumption of a 5 percent decisive percentage, the JTC credit program would generate additional state revenue of $11.8 million and local tax revenue of $9.4 million. Assuming a decisive percentage of 11.4 percent state revenue would increase by $26.9 million and local revenue by $21.3 million.

The last two columns of Table 18 present the estimate of the tax revenue from using $65.9 million to increase state government expenditures. The estimated tax revenue is less than the tax revenue from the JTC program.

Table 18. Estimates of Government Revenue

	State Tax revenue		Local Tax Revenue		Alternative Use	
($ *millions*)	5% Rate	11.4% Rate	5% Rate	11.4% Rate	State	Local
Income tax	$5.6	$12.8	$0.0	$0.0	$2.4	$0.0
Sales tax	$3.6	$8.1	$3.4	$7.7	$0.6	$0.6
Property tax	$0.0	$0.0	$6.0	$13.6	$0.0	$1.0
All Other taxes	$2.6	$5.9	$0.0	$0.0	$0.8	$0.0
Total Tax Revenue	$11.8	$26.9	$9.4	$21.3	$3.8	$1.6

There are several costs associated with the JTC program. The major costs are the credits that firms earned, which in 2019 totaled $65,550,270. Note that we have credits earned, not credits utilized, and thus cost is on an accrual and not cash basis.

Georgia's DOR and DCA both have administrative responsibility for Georgia's Job Tax Credit program.[9] To estimate the cost of administering the Job Tax Credit program, each department was asked to identify employees with some responsibility for administering the program and their salary and fringe benefits, and then multiple the salary and fringe benefits for each employee by an estimate of the percentage of the employee's time devoted to the JTC program. This approach was the one used in the evaluation of tax credit programs conducted by the Department of Audits and Accounts in 2006. The administrative cost was estimated to be $194,546 for DCA (see Appendix Table F2 for details). DOR provided an estimate of $1.22 million for the administrative cost for 42 tax credit programs (see Appendix Table F3), but was not able to break out costs to administer an individual business credit program like the JTC program. For 2019, job tax credits accounted for approximately 10.7 percent of total tax credits earned by the 42 tax credit programs. We used 10.7 percent of the $1.22 million, $130,673, as the estimate of DOR's administrative cost.

The total cost (i.e., tax credits and administrative costs) of the JTC program is $65.9 million, which is much larger than the additional state revenue generated, and even the combined state and local revenue generated. Thus, as shown in Table 19, Georgia's JTC program results in a net fiscal loss to the state, even when we consider the increase in total state and local revenue.

The last column of Table 19 presents the Return on Investment (ROI) for both the 5 percent decisive percent and the 11.4 percent decisive percent. For this calculation we use the increase in the tax revenue and the total of the cost of job tax credits and the administrative costs. The ROIs are negative and large for both decisive percentages regardless of which decisive percent we use.

Table 19. Estimated Net Revenue and ROI ($ *millions*)

Assumed Decisive Percentage	Estimated Revenue	Estimated Cost	Net Revenue	ROI
Panel A. State Revenue				
5%	$11.8	$65.9	($54.1)	-82.1%
11.4%	$26.9	$65.9	($39.0)	-59.2%
Panel B. State and Local Revenue				
5%	$21.2	$65.9	($44.7)	-67.8%
11.4%	$48.2	$65.9	($17.7)	-26.9%

[9] For a discussion of the administrative roles of DCA and DOR, see *Program Evaluation: Internal Controls over Corporate Income Tax Credits: Georgia Department of Revenue*, Georgia Department of Audits and Accounts Report 05-08. Available at https://www.audits.ga.gov/ReportSearch/download/5234.

The cumulative 5-year data reports that there were 67,902 new and retained jobs that earned a JTC in 2019, which totaled $201.6 in job tax credits. While the $201.6 million is the cost of the JTC program to the state in 2019, it is not the cost of the 22,668 new jobs created in 2019.

We used other data sources to confirm the reasonableness of two IMPLAN calculations above. The employment and labor income in Table 15 implies that labor income per worker is $63,981. This value is close to average compensation per worker of $67,471 for Georgia as reported by the U.S. Bureau of Economic Analysis. State and local tax revenue reported in Table 18 and labor income from Table 15 implies that state and local tax revenue as a share of labor income is 13.9 percent. BEA data implies that labor income as a percentage of personal income is 72.0 percent, which implies that state and local tax revenue as a share of personal income is 11.0 percent. This is larger than total state and local tax revenue as a percent of personal income of 7.88 percent, as reported for Georgia by the Census Bureau. Thus, if anything, IMPLAN calculations of tax revenue are larger than implied by Census data.

We calculated that the decisive percentage would have to be 15.5 percent in order for state and local tax revenue to exceed the cost of the JTC program, and 27.9 percent in order for state tax revenue to exceed the cost. So, selecting a somewhat larger decisive percentage than 11.4 percent would not change the basic conclusion.

Present Value of Fiscal Effects

Some, but not all credited jobs will exist for several years. Thus, the state will reap the benefit of the jobs created because of the JTC for several years. However, the state will continue to pay job tax credits for five years. We estimate the present value of the JTC program assuming a ten-year horizon.

Since jobs do not last forever, we need to first estimate the number of credited jobs that remain in each of the next 10 years. Using the Georgia DOL's employment security records, we identified establishments that by our account were eligible for a job tax credit in 2014 and measured the increase in employment for these establishments between 2013 and 2014. We then tracked these jobs and found that over time many establishments reduced their employment. We determined the number of these new jobs lost each year for five years; we did not include 2021 data in the analysis of lost jobs because the effects of COVID were unusual. Several establishments reduced their employment by more than the increase in jobs between 2013 and 2014. However, for our analysis we did not include jobs lost that exceeded the original increase. Using the pattern of job loss over the five years, we then projected job lost for the next 10 years. The percent of jobs remaining each year is shown in Table 20.

Table 20. Percent of Jobs Remaining

Year	Percent of New Jobs Remaining
Year 1	100.00%
Year 2	85.20%
Year 3	71.88%
Year 4	64.00%
Year 5	58.56%
Year 6	54.27%
Year 7	50.76%
Year 8	47.80%
Year 9	45.23%
Year 10	42.97%

For each year we calculate the effect of the JTC program on state net revenue. We assume that the cost of the job tax credits will fall by the same percentage as do the jobs, and then is zero after 5 years. We then calculate the present value of that stream of net revenues. We calculate the present value over 10 years using a discount rate of 2.625 percent. The discount rate is the 1st quarter 2020 average of 2-year and 10-year U.S. Treasury rates, which is a proxy for the state's expected return on invested funds. All values are in constant dollars.

For the case of the 5 percent decisive rate the present value of the stream of net revenues is a loss that totals $172.7 million. For the case of the 11.4 percent decisive rate the present value of the 10-year stream of net revenues is a loss of $87.3 million.[10]

12. Summary and Conclusions

Georgia's Job Tax Credit program was instituted in 1990, and has expanded in terms of the eligible industries, geographic coverage, and utilization. An analysis of Georgia's economic development incentives, including the job tax credit program, was conducted in 2000 (Faulk et al., 2000) and an evaluation was performed by the Georgia Department of Audits and Accounts in 2006. There have also been three studies that measure the effect of Georgia's Job Tax Credit program on employment (Faulk, 2002; Kuehn, 2016; and Gurmu et al., 2021).

For fiscal year 2022, the Georgia DOR reports that $270.2 million in job tax credits were utilized against tax liabilities on returns filed in the year, and the value of credit carryforwards at the end of the fiscal year was $659.5 million. This includes credits for jobs created in that year plus jobs created in the prior 4 years that have been retained.

Based on data from DOR, we estimate that 22,688 new jobs were created in 2019 that were eligible for job tax credits, while the number for 2020 is 26,322. Jobs earning a tax credit are

[10] As noted in the text, we use credits earned and thus cost is on an accrual basis. While firms appear to ultimately take all the credits earned, many firms delay taking the credits. This means that the correct present values are somewhat smaller (i.e., less negative) than reported in the text because of the delay in utilizing the credits.

located mainly in metro areas and particularly in the northern half of the state. The average credit per job is about $2,892 in 2019 and $2,781 in 2020.

Studies of the effect of job tax credits on employment find that the resulting number of jobs created is very small. Thus, a key variable in estimating the economic and fiscal effects is the percentage of the jobs that earn a tax credit that are actually the result of the job tax credit programs. Published research suggest that this percent is small, with a median of about 3.5 percent and a reasonable upper bound estimate of 11.4 percent (Bartik 2018).

Using IMPLAN, we estimate the economic and fiscal effects of Georgia's job tax credit program for 2019. We use data for 2019 given the concern that employment in 2020 was affected by the COVID pandemic and thus may not be representative.

The IMPLAN analysis suggests that economic activity due to the JTC generates substantially less state and local tax revenue than the cost of the Job Tax Credit program. Based on the empirically determined estimates of the decisive share of new jobs for which the JTC was responsible, we assume alternative decisive percentages of 5 percent and 11.4 percent. Our IMPLAN analysis suggests the JTC programs generate roughly 2,548 new jobs if the decisive percentage is 5 percent and 5,809 new jobs if the decisive percentage in 11.4 percent. This new economic activity generates $21.2 and $48.2 million in state and local tax revenue, respectively. This is less than the $65.9 million cost of the JTC program in 2019.

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Appendix A: Other Georgia Job Related Tax Credit Programs

Quality Jobs Tax Credit

Businesses may receive a Quality Jobs Tax Credit if they create and maintain net new jobs that pay at least 110 percent of the county's average wage. The value of the tax credit varies from $2,500 for jobs that pay between 110 percent and 120 percent of the county's average wage up to $5,000 for jobs that pay 200 percent or more of the county's average wage. The minimum number of jobs that must be created to be eligible varies across counties groups, which are determined by population and poverty rate. The credit can be taken for up to five years as long as the jobs are retained. A business cannot take both the JTC and the Quality Jobs Tax Credit.

Mega Project Tax Credit

To be eligible for the Mega Project Tax Credit a firm must hire 1,800 new employees, pay an average wage above some specified minimum, and either invest $450 million or have an annual payroll of $150,000. Firms meeting these requirements may claim a credit of $5,250 per job for five years. A business cannot take both the JTC and the Mega Project Tax Credit.

Premium Tax Credit

The Premium Tax Credit is very similar to the Job Tax Credit but applies to insurance companies, with the tax credit taken against the insurance premium tax.

Rural Physician Tax Credit

A physician whose practice is in a county that the state classifies as rural is allowed a tax credit of up to $5,000. The tax credit may be claimed up to five years, provided that the physician continues to qualify as a rural physician.

Appendix B: Credited Jobs by County

Table B1. Credited Jobs by County

	Credited Jobs			Credited Jobs	
County	**2019**	**2020**	**County**	**2019**	**2020**
Appling	9	127	Jefferson	2	10
Atkinson	0	7	Jenkins	11	4
Bacon	5	0	Johnson	0	0
Baker	0	0	Jones	0	0
Baldwin	9	128	Lamar	0	0
Banks	0	16	Lanier	0	3
Barrow	0	15	Laurens	129	4
Bartow	195	525	Lee	0	0
Ben Hill	22	37	Liberty	101	29
Berrien	0	69	Lincoln	0	0
Bibb	1100	1293	Long	0	9
Bleckley	28	4	Lowndes	332	184
Brantley	0	0	Lumpkin	0	0
Brooks	0	0	McDuffie	16	17
Bryan	13	212	McIntosh	0	0
Bulloch	163	23	Macon	0	0
Burke	116	0	Madison	0	0
Butts	6	48	Marion	0	0
Calhoun	6	0	Meriwether	7	7
Camden	2	9	Miller	0	0
Candler	0	67	Mitchell	0	88
Carroll	372	475	Monroe	0	180
Catoosa	0	0	Montgomery	0	0
Charlton	0	0	Morgan	45	39
Chatham	778	783	Murray	18	159
Chattahoochee	15	0	Muscogee	156	128
Chattooga	328	0	Newton	32	17
Cherokee	74	122	Oconee	0	13
Clarke	212	225	Oglethorpe	5	0
Clay	0	0	Paulding	2	51
Clayton	892	708	Peach	0	0
Clinch	0	0	Pickens	0	0
Cobb	906	873	Pierce	0	0
Coffee	101	164	Pike	0	0
Colquitt	206	9	Polk	26	2
Columbia	249	193	Pulaski	6	0
Cook	0	37	Putnam	253	283
Coweta	83	730	Quitman	0	0
Crawford	0	0	Rabun	56	34

County	Credited Jobs 2019	2020	County	Credited Jobs 2019	2020
Crisp	27	30	Randolph	0	0
Dade	0	0	Richmond	306	930
Dawson	0	0	Rockdale	65	18
Decatur	45	18	Schley	2	0
DeKalb	415	1431	Screven	20	8
Dodge	7	12	Seminole	0	0
Dooly	2	0	Spalding	109	32
Dougherty	435	283	Stephens	0	151
Douglas	426	226	Stewart	83	0
Early	0	6	Sumter	9	13
Echols	0	0	Talbot	0	0
Effingham	0	96	Taliaferro	0	0
Elbert	0	307	Tattnall	26	49
Emanuel	83	176	Taylor	0	0
Evans	7	33	Telfair	2	7
Fannin	0	0	Terrell	0	2
Fayette	90	0	Thomas	0	332
Floyd	53	224	Tift	116	30
Forsyth	114	12	Toombs	64	12
Franklin	0	66	Towns	0	0
Fulton	6087	6979	Treutlen	0	3
Gilmer	0	3	Troup	341	32
Glascock	0	0	Turner	0	0
Glynn	32	0	Twiggs	0	0
Gordon	263	61	Union	2	0
Grady	145	29	Upson	0	5
Greene	115	5	Walker	0	0
Gwinnett	1031	1205	Walton	0	20
Habersham	18	0	Ware	4	20
Hall	305	372	Warren	0	62
Hancock	3	0	Washington	0	0
Haralson	0	40	Wayne	0	0
Harris	48	0	Webster	0	0
Hart	126	255	Wheeler	0	0
Heard	0	0	White	0	0
Henry	1337	555	Whitfield	1661	1783
Houston	65	87	Wilcox	0	11
Irwin	64	16	Wilkes	0	0
Jackson	892	2031	Wilkinson	0	0
Jasper	518	28	Worth	0	56
Jeff Davis	18	0			
			Georgia	**22,668**	**26,322**

Appendix C: Studies of Job Tax Credit Programs

This appendix provides a review of academic studies that attempt to estimate the causal effect on job creation of tax credit programs. We first review studies of job tax credit (JTC) programs other than Georgia's job tax credit program and then consider studies of other programs that use tax credits to increase employment.

There are also job tax credit programs that target specific populations, including disadvantaged workers, former members of the armed services, youth, welfare recipients, etc., and supply side tax incentives such as the Earned Income Tax Credit. We do not consider these tax credit programs.

Studies of Job Tax Credit Programs

Gabe and Kraybill (2002) use data on 366 Ohio establishments that expanded their operations between 1993 and 1995 to estimate the effect of tax credits on two-year employment growth. They compare employment growth of the 129 of these establishments that were awarded a tax incentive to the employment growth of the 237 other establishments. Their empirical approach is similar to that used by Faulk (2000), i.e., a switching regression model. (See Section 5 for a discussion of Faulk (2000)). They include a host of control variables that are related to employment growth and find that the tax credits did not result in an increase in the employment growth.

Hicks and LaFaive (2011) consider the Michigan Economic Growth Authority (MEGA) credits. The MEGA program is not an entitlement in that the firm has to apply for the credit and be approved by the state. Hicks and LaFaive use annual county level data for the period 1990-2003, and thus include pre and post MEGA-adoption years. Their dependent variables are aggregate or sectoral employment, income, or unemployment rate, while the principal explanatory variable is the MEGA credits awarded in the county. The model accounts for long-run trends in the economy, the business cycle, labor force participation rates, and the impact of adjoining counties on employment and income in each of Michigan's counties. Formally, the econometric model is a fixed-effects instrumental variable model with spatial and time autocorrelation functions.

They find no impact of the MEGA credits on wages or employment at the county level, but they find a short-term gain in employment in the construction industry. Although they include several control variables, the possibility of unmeasured heterogeneity still exists.

Oklahoma's Quality Job program gives firms that create jobs a cash payment equal to a percent of the increased payroll. Whitacre, Shideler, and Williams (2016) estimated the effects of this incentive program on several outcomes, including growth of manufacturing employment, income, and population. Their empirical analysis compares communities in Oklahoma to communities in Kansas, which does not have a job growth incentive program. They use two empirical approaches, multivariate regression and a matching estimator approach. They conclude that economic growth between 1990 and 2005 was not statistically different between communities with and without businesses that participated in the Quality Jobs program.

Jensen (2017) estimated the effect of Kansas' PEAK (Promoting Employment Across Kansas) program. The PEAK program offers an incentive equal to up to 95 percent of state withholding tax for new workers for up to 10 years. Jensen uses data on establishments that received a PEAK incentive for years 2006 through 2012 and creates a control group of establishments using matching routines. Matching routines find establishments that are very similar to the establishments that received the incentive but did not get a PEAK incentive themselves. The use of matching routines is a common method used to generate a control group. Jensen finds that the PEAK program had no discernable impact on job creation; that is, there is no statistically significant difference in the employment creation between the treated and control firms.

Chirinko and Wilson (2016) and Neumark and Grijalva (2017) use an alternative approach to measuring the casual effects of job tax credits on employment. They use difference-in-differences models to measure the change in employment when a state adopts a JTC program. Chirinko and Wilson compare state employment growth pre- and post-adoption of a JTC across the 19 states that they identified as having adopted a broad-based JTC. They find that employment growth rises when firms become eligible for a job tax credit, and that this effect is larger the greater the time between when the program is announced, and when firms become eligible. Neumark and Grijalva also use the variation in the year that states adopt a job tax credit program, as well as variations in the nature of the JTC programs in order to identify the effect on job growth of job tax credits. They find no effect on employment for job tax credits when they do not control for JTC features but do find a positive effect for JTC programs with specific characteristics.

Studies of Non-Statewide Tax Incentive Programs

In addition to JTC programs that apply throughout the entire state, programs exist in which eligibility for JTCs is restricted to geographically defined sub-state areas. Maryland has a JTC program that provides a credit in selective urban areas of the state called Priority Funding Areas (PFA). The objective of the Maryland program is to concentrate economic growth in PFAs. The effect of the Maryland tax credit program was explored by Sohn and Knaap (2005). The control areas are the areas of the state that were not eligible for a tax credit. Sohn and Knaap use zip code employment in selective sectors over the period 1994-1998. Since the aggregate value of the tax credit is available by PFA, while employment is by zip code, Sohn and Knaap allocate the PFA tax credit to the zip codes in the PFA. The empirical models are estimated separately for manufacturing; finance, insurance, and real estate (FIRE); transportation, communications, and utilities (TCU); and services. Formally, the empirical model is called a fixed effect random growth model.

They find no effect on employment for 1997 in any of the sectors. For 1998, they find an increase in employment in the TCU and services sectors in the PFAs. Note that they are measuring the growth in employment in PFAs, not in the state. Thus, they state that it is likely that job growth in a PFA was simply geographic shifting of jobs from outside PFAs.

Other programs that are geographically restricted include enterprise zone and empowerment zone programs. There are numerous studies of the employment effects of these programs; Hanson (2009) provides a review of earlier research, while Neumark and Simpson (2015) provide an extensive analysis of more recent studies. Neumark and Simpson conclude that the

literature has produced very mixed results regarding the effectiveness of these place-based incentive programs.

There are many issues associated with measuring the effect of sub-state place-based incentive programs. It is common that the financial benefits available in an enterprise zone include a host of incentives, making it impossible to separate the effect of a job tax credit from the effect of other incentives. But the major issue is that these zones are not randomly chosen, so that in order to measure causal effects it is necessary to identify an appropriate control area or in some other way control for endogeneity in the selection of the treated area. Researchers have used three ways to address this issue: use an area that is similar to the zone; use areas targeted for a zone but not selected; address the endogeneity in how the zone is selection. Hanson and Rohlin (2017) compare alternative approaches and find wide-ranging estimates of program effectiveness across the various approaches, with both positive and negative point estimates and a range of statistical significance. They examine program outcomes using standard cross-section regression, difference-in-differences, triple difference, instrumental variables, and regression discontinuity; they construct comparison groups using several alternatives for each style of model.

Appendix D: Georgia Private Sector Nonfarm Employment by County

Table D1. Employment by County, 2019

County	Employ[a]	Growth (2014-19)	Growth Rate (2014-19)	County	Employ[a]	Growth (2014-19)	Growth Rate (2014-19)
Appling	7,733	751	10.76%	Jefferson	6,052	633	11.68%
Atkinson	2,587	418	19.27%	Jenkins	1,810	115	6.78%
Bacon	4,278	27	0.64%	Johnson	1,792	-39	-2.13%
Baker	659	73	12.46%	Jones	6,703	1,438	27.31%
Baldwin	16,857	1,560	10.20%	Lamar	4,582	386	9.20%
Banks	5,139	1,193	30.23%	Lanier	1,766	266	17.73%
Barrow	28,384	4,948	21.11%	Laurens	20,819	1,385	7.13%
Bartow	51,060	9,903	24.06%	Lee	9,279	1,944	26.50%
Ben Hill	6,458	-426	-6.19%	Liberty	18,357	2,068	12.70%
Berrien	4,552	193	4.43%	Lincoln	1,825	228	14.28%
Bibb	102,316	1,518	1.51%	Long	1,682	622	58.68%
Bleckley	2,914	-6	-0.21%	Lowndes	53,484	2,869	5.67%
Brantley	3,329	486	17.09%	Lumpkin	9,368	1,074	12.95%
Brooks	4,123	904	28.08%	McDuffie	8,637	983	12.84%
Bryan	12,344	2,584	26.48%	McIntosh	2,989	220	7.95%
Bulloch	28,588	3,302	13.06%	Macon	3,366	144	4.47%
Burke	15,289	5,800	61.12%	Madison	5,856	1,020	21.09%
Butts	8,703	1,492	20.69%	Marion	1,372	-606	-30.64%
Calhoun	1,028	-20	-1.91%	Meriwether	6,304	544	9.44%
Camden	14,981	1,464	10.83%	Miller	1,433	-219	-13.26%
Candler	4,102	690	20.22%	Mitchell	7,538	-373	-4.71%
Carroll	50,826	3,503	7.40%	Monroe	9,402	1,871	24.84%
Catoosa	20,078	2,956	17.26%	Montgomery	2,190	74	3.50%
Charlton	2,462	-33	-1.32%	Morgan	10,159	1,538	17.84%
Chatham	188,792	24,679	15.04%	Murray	9,959	-1050	-9.54%
Chattahoochee	2,546	32	1.27%	Muscogee	104,095	607	0.59%
Chattooga	6,946	-389	-5.30%	Newton	40,006	8,025	25.09%
Cherokee	101,423	20,640	25.55%	Oconee	20,262	5,119	33.80%
Clarke	69,228	7,054	11.35%	Oglethorpe	3,010	703	30.47%
Clay	699	98	16.31%	Paulding	44,326	13,726	44.86%
Clayton	165,198	25,616	18.35%	Peach	11,325	825	7.86%
Clinch	2,451	-273	-10.02%	Pickens	11,793	1,143	10.73%
Cobb	508,074	69,645	15.89%	Pierce	5,490	457	9.08%
Coffee	20,802	2,950	16.52%	Pike	4,770	658	16.00%
Colquitt	15,589	781	5.27%	Polk	14,002	-421	-2.92%
Columbia	51,270	8,456	19.75%	Pulaski	3,447	180	5.51%
Cook	4,793	673	16.33%	Putnam	7,738	890	13.00%
Coweta	57,387	8,254	16.80%	Quitman	443	-26	-5.54%
Crawford	1,944	469	31.80%	Rabun	7,331	867	13.41%

County	Employ[a]	Growth (2014-19)	Growth Rate (2014-19)	County	Employ[a]	Growth (2014-19)	Growth Rate (2014-19)
Crisp	9,747	-	0.00%	Randolph	2,141	124	6.15%
Dade	5,088	863	20.43%	Richmond	104,289	6,192	6.31%
Dawson	12,087	1,777	17.24%	Rockdale	45,225	4,450	10.91%
Decatur	9,425	421	4.68%	Schley	1,201	48	4.16%
DeKalb	421,143	33,500	8.64%	Screven	3,691	-45	-1.20%
Dodge	5,622	293	5.50%	Seminole	2,843	-83	-2.84%
Dooly	4,179	770	22.59%	Spalding	26,904	2,515	10.31%
Dougherty	51,713	1,311	2.60%	Stephens	9,727	-580	-5.63%
Douglas	63,930	9,983	18.51%	Stewart	1,582	200	14.47%
Early	4,005	-87	-2.13%	Sumter	12,114	205	1.72%
Echols	582	85	17.10%	Talbot	1,303	237	22.23%
Effingham	15,009	3,477	30.15%	Taliaferro	327	91	38.56%
Elbert	6,955	-26	-0.37%	Tattnall	6,231	593	10.52%
Emanuel	7,424	80	1.09%	Taylor	2,217	187	9.21%
Evans	5,069	82	1.64%	Telfair	3,151	-987	-23.85%
Fannin	10,676	1,715	19.14%	Terrell	2,593	-570	-18.02%
Fayette	62,901	9,057	16.82%	Thomas	22,848	-912	-3.84%
Floyd	46,744	2,744	6.24%	Tift	21,111	1,860	9.66%
Forsyth	112,433	23,363	26.23%	Toombs	13,709	-107	-0.77%
Franklin	9,697	808	9.09%	Towns	4,971	438	9.66%
Fulton	1,088,510	167,089	18.13%	Treutlen	1,493	80	5.66%
Gilmer	10,189	109	1.08%	Troup	47,199	3,281	7.47%
Glascock	542	52	10.61%	Turner	2,758	77	2.87%
Glynn	44,715	5,143	13.00%	Twiggs	2,721	1,145	72.65%
Gordon	27,167	4,353	19.08%	Union	8,813	911	11.53%
Grady	7,126	294	4.30%	Upson	8,214	478	6.18%
Greene	8,792	1,475	20.16%	Walker	17,461	1,060	6.46%
Gwinnett	527,907	68,403	14.89%	Walton	33,504	7,607	29.37%
Habersham	16,894	233	1.40%	Ware	16,809	1,326	8.56%
Hall	108,841	18,439	20.40%	Warren	1,934	219	12.77%
Hancock	1,763	8	0.46%	Washington	6,932	145	2.14%
Haralson	8,647	1,206	16.21%	Wayne	9,060	528	6.19%
Harris	9,192	2,208	31.62%	Webster	674	105	18.45%
Hart	8,876	1,542	21.03%	Wheeler	1,367	-200	-12.76%
Heard	2,560	16	0.63%	White	12,170	1,988	19.52%
Henry	98,871	21,925	28.49%	Whitfield	61,904	879	1.44%
Houston	58,658	9,471	19.26%	Wilcox	1,329	-200	-13.08%
Irwin	2,435	434	21.69%	Wilkes	3,265	110	3.49%
Jackson	36,835	12,999	54.54%	Wilkinson	4,550	991	27.84%
Jasper	3,622	764	26.73%	Worth	4,698	238	5.34%
Jeff Davis	5,081	-53	-1.03%				
				Georgia	**5,557,379**	**702,803**	**14.48%**

Appendix E: Value of Alternative Use – IMPLAN Code Table

Table E1 shows the approximate breakdown of state expenditures into functional areas that either directly correspond or are similar to the specified IMPLAN sectors in terms of the nature of labor and other inputs.

Table E1. Approximate Distribution of State Expenditures

Category	Share State Spending	IMPLAN Codes	IMPLAN Sector Descriptions
Education, PK-12	41.6%	480	Elem. and secondary schools
Education, Post-Sec	15.0%	481	Post-secondary education
Health Care	22.5%	493	Individual and family services
Public Safety, excl Corrections	3.5%	471	Facilities support services
Public Safety, Corrections	4.6%	475	Investigation and security services
Mobile Georgia	7.7%	457	Architectural, engineering, related svcs.
Growing Georgia	1.5%	469	Management of companies and enterprises
General Government	3.6%	469	Management of companies and enterprises

Source: Spending shares based on AFY 2019 and FY 2020 Governor's Budget Report
https://opb.georgia.gov/budget-information/budget-documents/governors-budget-reports

Appendix F: Estimated Administrative Cost

Table F1. Department of Community Affairs

Category	Cost
Salaries	$120,977
State Benefits	$61,361
Mandatory State Charges	$732
Tools Required for Job	$2,895
Rent	$5,955
Travel/Training	$1,300
Overhead Costs	$1,326
Total	**$194,546**

Table F2. Department of Revenue

Functional Area	
Taxpayer Services Division:	
Salaries	$513,545
Benefits	$317,032
Subtotal	$830,577
Office of Tax Policy:	
Salaries	NA
Benefits	NA
Subtotal	
Audits Division:	
Salaries	$241,550
Benefits	$149,118
Subtotal	$390,668
Total	**$1,221,245**

NA: not available