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ANDERSON ECONOMIC GROUP

The Economic Impact of Business Tax Credits in Tennessee

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I.Executive Summary

State and local governments have a range of policy tools at their disposal to encourage economic growth, increase wages, and create jobs for local residents. Targeted tax credits for businesses are one of the most common policy tools used to accomplish these goals. In particular, many state governments offer business tax credits that are directly tied to new hiring or investment in the state, especially when that hiring or investment occurs in economically depressed areas.

While business tax credits and grants that encourage expansion or relocation have grown across the country over the past several decades, their effectiveness is not guaranteed and depends on their structure and implementation. Unfortunately, according to the Pew Charitable Trusts, "lawmakers often approve or continue incentives without knowing their potential cost or whether they are working. State leaders need better information to avoid unexpected budget challenges, identify effective incentives, and reform or end programs that are not meeting expectations."[1] To ensure that business tax credits are effective and efficient at improving the state's economy, states should learn from best practices in other states and regularly evaluate the impact of the tax credits they provide.

The State of Tennessee has been working to improve its business incentives since at least 2013, when it was chosen by Pew and the Center for Regional Economic Competitiveness (CREC) as one of seven states to participate in an assessment of business incentives policy and practice. During that assessment, Tennessee was identified as a leader in due diligence, agency coordination, and data transparency. The assessment also identified several opportunities for improvement. The State has already acted on several of those opportunities, including by proactively removing some credits that were ineffective. A further opportunity that arose from the assessment entailed the establishment of a process to evaluate the effectiveness of all economic development incentives.

PURPOSE OF REPORT

To that end, the Tennessee legislature passed Senate Bill 322 in June 2015, requiring the Department of Economic and Community Development (ECD) and the Department of Revenue to evaluate a set of tax credits provided to businesses in Tennessee. To aid in its evaluation, the ECD and the Department of Revenue commissioned Anderson Economic Group to perform research and analysis to estimate the economic impact of a set of business tax credits, and to provide recommendations based on the results.

1. The Pew Charitable Trusts, "Why Tax Incentives Matter," http://www.pewtrusts.org/en/projects/economic-development-tax-incentives, accessed October 19, 2016.

In this report, we estimate the economic impact of a set of tax credits for businesses in the State of Tennessee. For each credit, we present summary information about its use, relevant and rigorous economic research on the impact of that type of credit, and our estimate of the credit's impact, if data and research are sufficient to provide an estimate.

OVERVIEW OF APPROACH

In this report, we analyze all active business tax credits outlined in Tennessee Code §§ 67-4-2009, 67-4-2109, and 67-6-224.[1] These credits include:

- jobs tax credits, including the standard jobs tax credit, the super jobs tax credit, the Tier 2 and Tier 3 jobs tax credit, and the disability jobs tax credit;
- the industrial machinery tax credit;
- the headquarters sales tax credit;
- the community investment tax credit; and
- the small business opportunity fund and rural opportunity fund tax credits.

For a detailed description of each tax credit, see "Business Tax Credits in Tennessee" on page 14.

Economic impact defined. Economic impact is defined in this report as the net increase in economic output (spending), employment, and/or earnings in Tennessee due to a tax credit. In estimating economic impact, we are careful to identify and exclude any activity that would have happened even in the absence of the credit. For example, we consider whether employees hired at a firm receiving the job credit may have been hired even in the credit's absence, or whether construction of low-income housing using the community investment tax credit replaces (or "crowds out") other forms of housing. In each case, we attempt to determine the amount of employment, earnings, and output in Tennessee that was *caused* by the credit, and exclude activity that would have occurred even in the credit's absence.

Limitations. This analysis has two important limitations. First, we do not attempt to compare our economic impact estimates with an estimate of the impact if government funds foregone to provide the credit were instead used to invest in government services or reduce other taxes. Policymakers should compare the economic impacts summarized in this report to the impact of other alternatives, such as

1. Many business tax credits in these statutes have been discontinued, though businesses that were previously awarded credits can still claim them if they have not expired. We do not examine those discontinued credits in this report. We also do not examine tax credits which are offered as offsets, as opposed to incentives, such as the tax credit for taxes paid on revenue from gross premiums.
   Finally, brownfield tax credits are covered in these statutes and were claimed during this period of study, but only by two companies. Since the State was required to suppress data that would allow us to identify information about individual firms, we were not provided data on the brownfield tax credit and did not perform analysis on the brownfield credit in this report.

broader-based tax cuts, additional health care or education spending, or other alternative uses of these funds.

Second, the credits we evaluate in this report are often provided as part of a package of credits and grants assembled by the ECD to attract companies relocating to the state or to encourage expanding companies to remain in the state. As such, these credits augment the tools available to the ECD to attract and retain businesses. We were not provided with firm-level data on the scale and nature of tax credits provided, and there is no "but-for statement" required of companies receiving these packages. Their use as a supplement to ECD packages is a potentially important way in which these credits have an economic impact, but we do not capture this component of their economic impact in this report. For details on the use of business tax credits in Tennessee by companies with ECD projects, see "Business Tax Credits Claimed by Companies with ECD Projects" on page 24.

Methods and sources. To come to our estimates of economic impact, we used results from our literature review, as well as statistical analyses of data provided by Tennessee government agencies.

We first performed research on Tennessee statutes and met with representatives from the Department of Revenue to fully understand how the business tax credits in Tennessee are administered. We then collected data from the ECD, Department of Revenue, and Department of Labor and Workforce Development for the years 2010 through 2015. For confidentiality purposes, we were not provided with data on individual firms, which considerably limited the options for our analysis.

We performed a literature review to determine what rigorous economic research has found regarding the impact of tax credits like those in Tennessee. Sources for this literature review included peer-reviewed academic studies, government reports, and studies from research organizations and consultants. For our research on tax credits in peer states, we used information from peer states' Departments of Revenue, Economic Development, or similar agencies.

Awarded vs. claimed. Throughout this report, we describe tax credits as awarded and claimed, respectively. For clarity, we define those terms here. A tax credit is *awarded* when a company performs the activity that makes it eligible for the credit—for example, when a company hires new workers in the case of the jobs tax credit or purchases industrial machinery in the case of the industrial machinery credit. A tax credit is *claimed* when a company uses the tax credit to reduce its tax liability. In many cases, a tax credit can be claimed several years after it has been awarded. Throughout this report, we describe the tax credits awarded in a year plus tax credits carried over from previous years (not yet claimed or expired) as the *available* tax credits in that year.

OVERVIEW OF FINDINGS

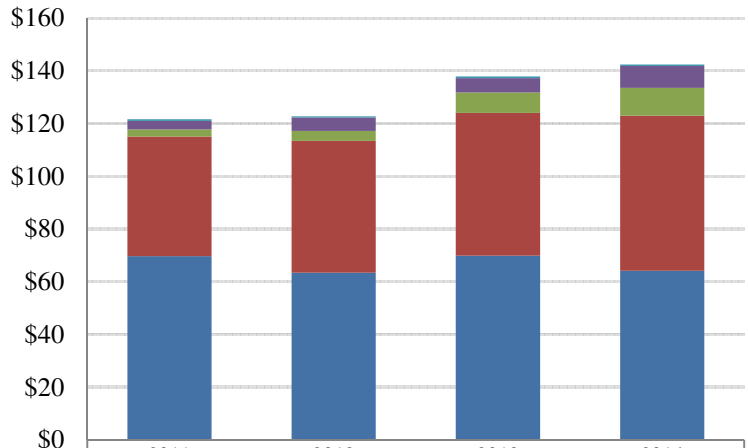
Our research and analysis resulted in the following findings:

1. *In 2014, businesses in Tennessee claimed $142 million in tax credits, an increase from about $122 million in 2011. Nearly 90% of those credits were in the form of jobs tax credits and industrial machinery credits.*

In 2014, businesses in Tennessee claimed $142 million in tax credits of the type investigated in this report. As we show in Figure 1 on page 4, the amount claimed increased from about $122 million in 2011. Nearly 90% of the credits claimed in 2014 were in the form of jobs tax credits and the industrial machinery credit. Over 1,780 businesses claimed the industrial machinery credit and over 300 businesses claimed the standard jobs tax credit.

Businesses in "manufacturing" claimed nearly 60% of the business tax credits in Tennessee. Businesses in "management of companies and enterprises" represented 11% of the tax credits claimed, while businesses in "finance and insurance" followed with 6% of the credits claimed.

FIGURE 1. Business Tax Credits Claimed by Credit Type, 2011-2014 (millions)



	2011	2012	2013	2014
Small Business and Rural Opportunity Funds Credit	$0.7	$0.5	$0.6	$0.6
Community Investment Credit	$3.2	$5.0	$5.4	$8.2
Headquarters Credit - Sales Tax	$2.7	$3.8	$7.7	$10.5
Jobs Tax Credits	$45.4	$50.0	$54.2	$58.9
Industrial Machinery Credit	$69.6	$63.3	$69.8	$64.1
Total	$121.6	$122.7	$137.8	$142.4

Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

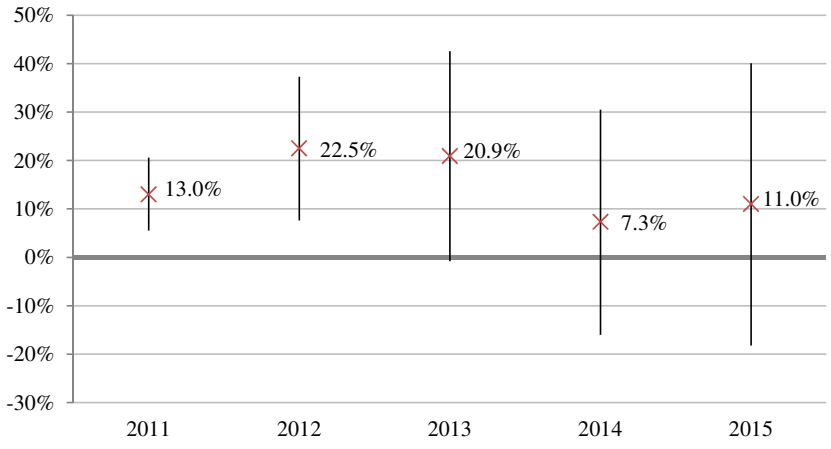
Businesses in "target clusters," which are clusters of industries where the ECD focuses its recruitment efforts, claimed at least 40% of the business tax credits claimed. The three largest target clusters by total credits claimed were "chemicals, plastics, and rubber," "automotive," and "food and agribusiness."

See "Recent Trends in Tennessee Business Tax Credits" on page 19 for further discussion.

2. *Companies that were awarded the jobs tax credit increased employment by 20% more than their peers, on average, within a year of being awarded the credit. This effect was no longer statistically significant by the third year after being awarded the credit.*

Jobs tax credits are awarded to employers based on the number of people they hire in Tennessee within a given time span. We found that companies that were awarded the jobs tax credit increased their employment, on average, relative to companies in the same industry that did not receive the credit. This effect peaked at about 20% the year after being awarded the credit and faded to about 10% by the third year, when it was no longer statistically significant. Companies that were awarded a jobs tax credit hired approximately 15,000 more people, in all, than their peers each year.

FIGURE 2. Growth in Employment Since 2010 for Companies Awarded the Jobs Tax Credit in 2011, Difference from Industry Average



Source: AEG analysis based on data provided by the Tennessee Department of Revenue and Tennessee Department of Labor and Workforce Development.
Note: Error bars represent 95% confidence interval.

Our results suggest that firms that claim the jobs tax credit tend to cluster hiring in the year in which they are eligible for the credit and then make fewer hires in subsequent years, relative to their peers. Figure 2 above shows the change in

employment over time at companies that were awarded the jobs tax credit in 2011 relative to their peers.

Of course, companies that apply for the jobs credit are expecting to hire more people, and many would have hired more people whether they received the credit or not. For this reason, this evidence does not suggest that all of these jobs were *caused* by the jobs tax credit.

See "Employment at Jobs Tax Credit Recipients" on page 34 for more information.

3. The annual effect of jobs tax credits alone was an increase of 600 jobs, $46 million in earnings, and $45 million in output in Tennessee, on average, from 2011 to 2014.

Since jobs tax credits are provided based on how many people a company hires, they are effectively a reduction in the cost of compensation for new employees. The reduction in cost of labor provided by the jobs tax credits in Tennessee resulted in a 0.6% to 1.8% increase in hiring at firms awarded the credit, on average, depending on which credit was awarded. This hiring increase also resulted in an increase in earnings for Tennessee residents. We estimate that 235 new jobs and about $33 million in wages at firms receiving the credit in Tennessee are attributable to the availability of the credit, on average.

There are also indirect effects since these new workers had more earnings to spend in the local economy. We estimate that this additional spending resulted in an additional 364 new jobs and $13 million in earnings, for a total of 600 jobs and $46 million in annual earnings in the state.

TABLE 1. Average Annual Economic Impact of Jobs Tax Credits in Tennessee, 2011 to 2014

	Direct	Indirect	Total
Employment	235	364	600
Earnings	$33.1 million	$13.3 million	$46.4 million
Output	$0	$45.3 million	$45.3 million

Source: AEG analysis based on data provided by the Tennessee Department of Revenue, Tennessee Department of Labor and Workforce Development, Bureau of Labor Statistics, and Bureau of Economic Analysis

See "Elasticity Analysis" on page 36 for more information.

4. Companies that claimed the industrial machinery credit lagged employment growth at peer companies but surpassed average wage

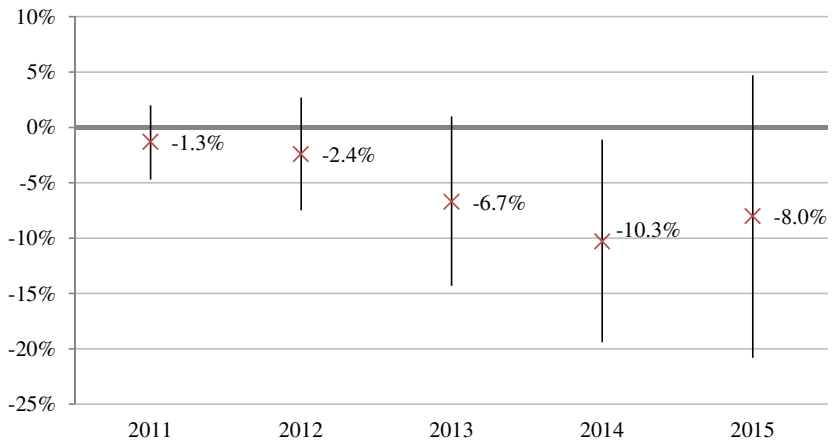
growth at peer companies, on average, after being awarded the credit. Neither effect was statistically significant.

Companies that were awarded the industrial machinery credit invested in new industrial machinery or other capital equipment. On average, companies that claimed these credits had a lower growth rate for employment than peer companies that did not claim the credit; however, these companies had a higher growth rate for average wages than peer companies that did not claim the credit. Figure 3 below shows the change in employment at companies that were awarded the industrial machinery tax credit in 2011 relative to their peers, and Figure 4 on page 8 shows the change in average wages at companies that had received the industrial machinery credit prior to this time period.

As with the jobs tax credit, we do not have the data to determine whether these employment and wage changes were *caused* by the credit. There are at least two potential explanations for these relative effects. Firstly, it is possible that companies that apply for the industrial machinery credit are more likely to be in distress prior to applying for the credit, and therefore would have reduced employment even in its absence. Secondly, companies apply for the industrial machinery credit to stay competitive, by using the machinery that they purchase to modify their operations in such a way that requires less, but more skilled labor.

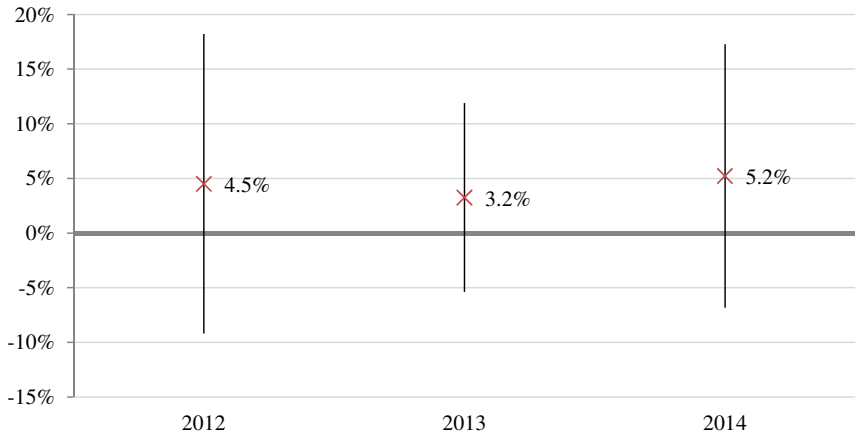
In either case, this result suggests that there is no direct positive effect on employment in the state due to the industrial machinery credit, at least in the short term, but there may be an effect on productivity and wages.

FIGURE 3. Growth in Employment Since 2010 for Companies Awarded the Industrial Machinery Credit in 2011, Difference from Industry Average



Source: AEG analysis based on data provided by the Tennessee Department of Revenue and Tennessee Department of Labor and Workforce Development
Note: Error bars represent 95% confidence interval.

FIGURE 4. Relative Growth in Wages Since 2011 at Companies That Claimed the Industrial Machinery Credit between 2011 and 2014



Source: AEG analysis based on data provided by the Tennessee Department of Revenue nd Tennessee Department of Labor and Workforce Development.
Note: Error bars represent 95% confidence interval.

See "Employment at Industrial Machinery Tax Credit Recipients" on page 42 for more information.

5. The industrial machinery tax credit resulted in an economic impact of $7.4 million annually in Tennessee, on average, due to increased purchases of industrial machinery and other eligible equipment. This resulted in $2.0 million in annual earnings and 55 jobs.

While the primary purpose of the industrial machinery credit is to improve productivity and investment at Tennessee firms, it has an indirect economic effect, as well. Some of those firms increase their spending in the state as they increase investment. We estimate that annual industrial machinery purchases by Tennessee companies increased by $86 million annually, on average, due to the credit. We estimate that around $4 million of these additional purchases were made at Tennessee companies, resulting in an economic impact on output in the state of $7.4 million. This also resulted in $2.0 million in annual earnings and 55 jobs.

See "Impact of Increased Industrial Machinery Purchases" on page 43 for more information.

6. Corporate headquarters sales tax credits have a negligible economic impact in Tennessee.

An extensive review of literature on the economic impact of tax credits for corporate headquarters reveals that corporations make headquarters location decisions based on access to operations, infrastructure, and a local talent pool. Tax credits for headquarters, in general, appear to have impact on relocation deci-

sions only at the margins, and given the size of headquarters tend to have little statewide economic impact. In addition, a sales tax credit is a particularly inefficient way to provide incentives for relocating headquarters due to compliance costs, reducing the importance of sales tax credits within the incentive package offered for relocation.

One potential source of economic impact from these credits is an increase in goods purchased in the state, since the recipient no longer is required to pay sales tax on purchases. However, given the nature of purchasing decisions in establishing a national or global headquarters, there is little reason to believe that a sales tax credit significantly affects these decisions. Therefore, we conclude that the economic impact of the sales tax credit for headquarters is very small.

See "Headquarters Sales Tax Credit" on page 47 for more information.

7. The community investment tax credit resulted in the construction or preservation of 1,500 affordable housing units from 2011 to 2014. The economic impact of the construction effort attributable to the credit was an estimated $11 million in annual earnings and 236 jobs.

On average, from 2011 to 2014, loans that were eligible for the community investment tax credit (CITC) were used to build or preserve 360 units of owner-occupied affordable housing and 944 units of affordable rental housing per year. Economic literature on the impact of these loans suggests that affordable rental housing construction tends to crowd out other housing construction activity, but affordable *owner-occupied* housing construction does not. Therefore, we can conclude that a large portion of the spending on construction induced by the CITC would not have happened in Tennessee if not for the credit.

Approximately $26 million in loans were provided to finance this housing in 2011, increasing to $47 million in 2014. On average, the portion of this construction financed by CITC loans resulted in 236 jobs and $11 million earnings, annually.

TABLE 2. Average Annual Economic Impact of Affordable Housing Construction due to the CITC in Tennessee (dollar amounts in millions)

	Direct	Indirect	Total
Employment	0	236	236
Earnings	0	$10.6	$10.6
Output	$15.0	$18.9	$33.9

Source: AEG analysis based on data from the Tennessee Department of Revenue and Bureau of Economic Analysis

See "The Economic Impact of Affordable Housing Construction" on page 53 for more information.

8. While the small business opportunity fund and rural opportunity fund tax credits have brought in $71 million in financing for small businesses—and minority- and women-owned businesses, in particular—the statewide economic impact is unclear.

Financing for the small business opportunity fund and rural opportunity fund depends on loans and contributions from the financial sector that are incentivized by tax credits. These two funds provide credit to small businesses that have been unable to obtain loans otherwise, with a particular emphasis on minority- and women-owned businesses. As of last year, the small businesses opportunity fund had provided credit to 92 businesses and the rural opportunity fund had provided credit to 72 businesses, totaling $71 million in loans between them.

There is strong evidence that availability of credit can help small businesses thrive, and that thriving small businesses can contribute to a local economy. However, without more detailed knowledge about the firms that received loans and the nature of their operations and finances, we cannot make any specific claims about whether the funds have resulted in a net increase in economic activity in the state.

RECOMMENDATIONS

Based on our research and analysis, we make the following recommendations for potential changes to the structure, implementation, and monitoring of business tax credits in Tennessee.

1. The jobs tax credit and industrial machinery credit can only be applied to half of a firms' franchise and excise tax liability, and are rolled over for up to 15 years. Uncertainty and delay in the collection of these credits lower their value for expanding companies. The State should consider ways to restructure the jobs tax credit and industrial machinery credit to make them more efficient and effective. One option would be to make these credits refundable, potentially adding a clawback provision. While such a reform may be administratively difficult, it would allow the State to reduce the size of the credits and still provide greater incentives for hiring and investment.
2. The jobs tax credit for people with a disability is not being used, suggesting that it is not an effective way to incentivize jobs for disabled workers. If the State wants to encourage the entry of disabled residents into the workforce, it could make the credits more generous, or reroute these funds toward other services such as training or accessibility programs.
3. The headquarters sales tax credit does not seem to provide any economic incentives beyond those that would be provided by a generic increase in the amount of total credits and grants that the State can offer to relocating or expanding headquarters. As such, it is a particularly unwieldy and costly incentive to comply with. The State should consider replacing the headquarters sales tax credit with a more efficient option. Options could include an increase in the size of the

budget for headquarters grants, or a sales tax credit that is predetermined based on the size of a company's investment.

4. ECD and the Department of Revenue should produce an annual report showing how many credits have been awarded, claimed, and rolled over; the nature of the companies receiving the credits; and more. This would increase transparency and allow for consistent monitoring of these programs. As an additional benefit, a more sustained effort to collect this information would encourage better and consistent monitoring and collaboration across the Department of Revenue, Department of Labor and Workforce Development, and the Department of Economic and Community Development.

ABOUT ANDERSON ECONOMIC GROUP

Anderson Economic Group, LLC, is a boutique research and consulting firm, with offices in Chicago, Illinois; East Lansing, Michigan; New York, New York; and Istanbul, Turkey. The experts at AEG specialize in economics, public policy, business valuation, and industry analyses. They have conducted nationally-recognized economic and fiscal impact studies for private, public, and non-profit clients across the United States.

The team at Anderson Economic Group has a deep understanding of advanced economic modeling techniques and extensive experience in a variety of industries in multiple states and countries. Work by AEG has been utilized in legislative hearings, legal proceedings, and public debates, as well as major planning exercises and executive strategy discussions. For more information, please see "Appendix D. About AEG" on page D-1 or visit www.AndersonEconomicGroup.com.

II.Business Tax Credits in Tennessee

In this section, we first generally discuss the purpose and use of tax credits for businesses to encourage economic activity. We then go into detail about each of the business tax credits available in Tennessee that we will analyze in this report.

PURPOSE OF BUSINESS TAX CREDITS

States throughout the U.S. have provided business incentives since as early as 1791, when the state of New Jersey offered a company a tax exemption to build an industrial park.[2] Business incentives can come in the form of grants, tax credits, and loans provided directly by state and local governments.

State and local governments use incentives for the following purposes:

1. **Address Cost Disadvantages**
   Incentives are used to reduce the overall cost of doing business for firms that are starting up, expanding, or relocating.
2. **Revitalize Distressed Local Economies**
   Governments often offer more generous incentives to business that choose to locate in areas with higher rates of unemployment and poverty. Tennessee provides additional tax credits to firms that locate in so-called Tier 2 and Tier 3 counties, which are defined as counties in economic distress by the ECD.
3. **Encourage Beneficial Behavior**
   Many states have incentive programs that encourage beneficial behavior, such as lowering plant emissions, creating new products, or providing social services.
4. **Targeted Industrial Policy**
   Some states use incentives to attract or support an industry that is not already prevalent in the state due to the potential strategic importance of the industry to growing the state's economy. For example, the ECD has a set of target clusters in which they focus recruitment efforts due to the state's competitive advantage.

While the statewide economic impact of business tax credits is the focus of this report, the goal of these programs is not always to maximize the statewide economic impact. For example, incentives that encourage plants to lower emissions might result in higher costs for consumers and potentially fewer jobs. Incentives that direct investment toward high-poverty counties can draw investment away from areas where it would be more productive. The goal of these programs is to balance statewide economic growth with other interests, such as addressing climate change or reducing rural poverty. Insofar as they have other well-defined

2. Peter Eisinger, *The Rise of the Entrepreneurial State: State and Local Development Policy*, Wisconsin, 1988.

goals, business incentives can be successful even with an insignificant or negative economic impact.

While the State of Tennessee offers a range of business incentives that fit the categories listed on the previous page, in this report we focus only on the set of tax credits listed in "Business Tax Credits in Tennessee" on page 14. Importantly, these tax credits are often used as part of a larger package along with ECD grants and other incentives for relocation or expansion. Therefore, it is not always appropriate to consider a tax credit's goals or effectiveness in isolation, but as one tool in a toolkit alongside several other incentives that are often used in combination.

Common Incentive Components

There are two components of business incentives that are very common: but-for statements and clawback provisions. While neither of these components are used in Tennessee, it is important to understand them in order to better understand how Tennessee tax credits work, and how they compare to tax credits in other states. We discuss each below.

But-for statements. Incentives have the greatest impact when they compel businesses to do something (relocate to the state, hire more people, make investments, etc.) that they would not do without the incentive. For this reason, state and local governments often require that businesses applying for a tax credit, grant, or loan sign a "but-for statement." With this statement, a company guarantees, under legal penalty, that it would not perform the steps that make it eligible to receive the incentive *but for* the incentive being provided. For example, a business relocating to the state is only eligible to receive a relocation grant if it asserts that it would locate elsewhere without the grant.

There is reason to believe that companies often sign "but-for statements" in bad faith because the incentive to sign them can be very high and it is very difficult to prove that a company is lying. However, these statements can act as at least a mild deterrent. Many companies planning on an expansion whether or not they received a credit might refrain from taking advantage of the credit if there were a required but-for statement in order to be eligible.

Clawback provisions. Clawback provisions are used to ensure that companies maintain a given level of employment, investment, wages, or other commitment years after initially signing onto an agreement. Many states and local governments provide up-front lump sums to incentivize relocation or expansion. If the agreement comes with a clawback provision, that lump sum or a portion of it can be taken back if a company does not maintain its performance over an agreed-upon period of time.

Clawback provisions make it so that an incentive can be provided upfront—at a time when the company needs it most—while ensuring that the company maintains a commitment to the state or locality that provided the incentive. One drawback of clawback provisions is, if they are too strong, companies can perceive the incentive as too risky and avoid taking it. Another drawback is that clawbacks are by definition required when a company is already struggling to maintain its current level of operations in the state. Invoking a clawback provision might result in adding insult to injury and harming a company that may have otherwise been a valuable employer in the local or state economy.

BUSINESS TAX CREDITS IN TENNESSEE

In this report, we analyze all business tax credits outlined in Tennessee Code §§ 67-4-2009, 67-4-2109, and 67-6-224 that continue to be available for businesses today.[3] These credits include the following:

- Jobs tax credits, including the standard jobs tax credit, the super jobs tax credit, the Tier 2 and Tier 3 jobs tax credit, and the disability jobs tax credit;
- Industrial machinery tax credit;
- Headquarters sales tax credit;
- Community investment tax credit; and
- Small business opportunity fund and rural opportunity fund tax credits.

We describe each credit in detail below.

Jobs Tax Credits

The jobs tax credit (JTC) is used to reduce the state franchise and excise (F&E) tax for businesses that commit to create a certain amount of jobs in Tennessee. The size of the jobs tax credit for a business is calculated using the size of investment, number of jobs created, and project location. The following section details the four major jobs tax credits offered in Tennessee, including the standard jobs credit, the Tier 2 & 3 jobs tax credit, the super jobs tax credit, and the credit for employing persons with disabilities.

Standard Jobs Tax Credit. To qualify for this credit, a business must create at least 25 full-time jobs and invest a minimum of $500,000 in real property, tangible personal property and computer software. The size of the credit is $4,500 for

3. Many business tax credits in these statutes have been discontinued, though businesses that were previously awarded credits can still claim them if they have not expired. We do not examine those discontinued credits in this report. We also do not examine tax credits which are offered as offsets, as opposed to incentives, such as the tax credit for taxes paid on revenue from gross premiums.
   Finally, brownfield tax credits are covered in these statutes and were claimed during this period of study, but only by two companies. Since the State was required to suppress data that would allow us to identify information about individual firms, we were not provided data on the brownfield tax credit and did not perform analysis on the brownfield credit in this report.

each new job created, and could be enhanced to $5,000 if the business makes a minimum investment of $10 million.

The credit awarded in a given year is based on new hiring that occurs in that year. Any unclaimed amount can be carried forward up to 15 years. The amount of credit claimed in any given year cannot exceed 50% of a business's franchise and excise tax liability.

Tier 2 & 3 Jobs Tax Credit. The purpose of this credit is to incentivize businesses to locate and expand in Tier 2 and Tier 3 Enhancement Counties. The tier designation is based on monthly statistics of the average number of dislocated workers and per capita income from the Department of Labor and Workforce Development.

In addition to the $4,500 standard JTC, businesses in a Tier 2 county also receive a 3-year annual credit of $4,500 per job created. The additional credit applies against 100% of F&E liabilities. A 5-year annual credit of the same term applies to companies located in Tier 3 counties. Unlike the standard JTC, any unused Tier 2 & 3 jobs tax credits cannot be carried forward or used in a new tax year.

Additional Job Tax Credit for Higher Level of Investment. An additional job tax credit ("super credit") is available at higher levels of investment when a company establishes headquarter facilities in the State of Tennessee. Eligible projects must satisfy a minimum wage requirement equal to the average occupational wage in the state as well as a minimum investment requirement of $10 million.

TABLE 3. Summary of Super Job Tax Credits

Minimum Investment	Qualified Jobs	Annual Credit per Job	Duration of Annual Credit
$1,000,000,000	500	$5,000	20 years
$500,000,000	500	$5,000	12 years
$250,000,000	250	$5,000	6 years
$100,000,000	100	$5,000	3 years
$10,000,000[a]	100	$5,000	3 years

Source: Tennessee Department of Revenue

a. only applies to headquarter facilities with a minimum wage requirement equals to 150% of the state's average occupational wage

Qualified businesses receive an annual credit of $5,000 for each job created. Depending on the size of the investment and number of qualified jobs, a busi-

ness may claim the credit for up to 20 years. The super credit may be used to offset 100% of F&E liability. It is issued once a year, and any unused amount expires in the same year.

Job Tax Credit for Employing Persons with Disabilities. The State of Tennessee offers a tax credit to employers who hire persons with disabilities. A company receives a credit of $5,000 for hiring a qualified person for a full-time position, and $2,000 for a part-time position. Any unused credit may be carried forward for up to 15 years.

Industrial Machinery Credit

The State of Tennessee offers a tax credit to businesses that purchase industrial machinery that will be used in the state. The purchase can be made on machinery produced in Tennessee or on machinery imported to Tennessee.

The credit applies to the purchase price of any industrial machinery used in manufacturing, storage, handling, or transporting tangible property, packaging, and other machinery involved in the production of goods.[4] The credit also applies to the purchase price of computers, computer networks, or other hardware. The total amount of the credit varies from 1% to 10% of the purchase price, depending on the size of the investment. See Table 4 below for the rate at varying levels of investment. Unclaimed credits can be carried forward for up to 15 years.

TABLE 4. Industrial Machinery Credit at Different Levels of Investment

Industrial Machinery Purchased	Size of Credit
$1,000,000,000	10% of purchase price
$500,000,000	7% of purchase price
$250,000,000	5% of purchase price
$100,000,000	3% of purchase price
<$100,000,000	1% of purchase price

Source: Lexis Nexis State Code of Tennessee; Last Accessed: 7/7/2016

The amount claimed under this credit cannot exceed 50% of the tax liability in a given year, unless the Commissioners of Revenue and Economic and Community Development approve the additional claim for the year. The state can also reclaim a portion of the credit if the machinery is sold or moved during the

4. For a full list of eligible purchases, see Tennessee statute §67-6-102.

depreciation period. The reclaimed amount is equal to the proportion of the remaining depreciation period multiplied by the original amount of the credit.

Community Investment Tax Credit

Financial entities that make qualified loans or investments to low income-housing entities are eligible for credits on their franchise and excise taxes. The loans must be used in construction or preservation of low-income housing and related activities. Also, the credit is only available for loans to nonprofits, Tennessee housing development agencies, public housing authorities, or development districts.

To qualify, loans must have an interest rate at least 2% below the prime rate when the loan is approved. The lender receives a credit equal to either:

- 5% of the loan or long-term investment made
- 3% annually of the unpaid principal balance of the loan made

The credit is higher for qualified *low-rate* loans, grants, or contributions to a low-income housing entity. Low-rate loans are at least 4% below the prime rate when the loan is approved. In these cases the lender receives a credit equal to either:

- 10% of the loan, grant, or contribution made
- 5% annually of the unpaid principal balance of the loan made

Unclaimed community investment development credits can be carried forward for 15 years if they take the form of 5% of the loan amount (10% of a low-rate loan). If the company instead chooses to take a credit of 3% annually on the unpaid principal balance of the loan (5% annually on a low-rate loan), the unclaimed credits do not carry forward.

Rural and Small Business Opportunity Fund Credit

Financial entities that make a contribution or a loan to the Tennessee Rural Opportunity Fund or the Tennessee Small Business Opportunity Fund are eligible for credits on their franchise and excise taxes. The contributor/lender receives a credit equal to:

- 10% of the contribution or loan amount for 10 years

Unclaimed credits do not carry forward. If a contributor attempts to recapture any of the contributed amount from the fund at any point, the State can claw back a portion of these credits equivalent to the recaptured amount plus interest.

Headquarters Credit (Sales Tax)

The State of Tennessee also offers a sales tax credit, with some restrictions, to companies that establish a headquarters in the state. To qualify, a company must establish either a national or international headquarters, invest $10 million, and create 100 new full-time jobs in Tennessee. In prior years, regional headquarters also filled this definition, but as of July 1, 2015, no new regional headquarters applications are accepted to claim this credit.

To claim the credit, the company must file an investment plan with the Commissioner of Revenue. If the plan is approved the company must submit a claim and proof that the minimum investment has been made and that the jobs commitment has been fulfilled. The Commissioner, in conjunction with the Commissioner of ECD, can lower the investment and jobs requirement, which will reduce the size of the credit in proportion to the reduced requirements.

The only jobs that count toward this credit are those where employees work at least 37.5 hours per week, receive health care benefits, get 150% of the state average wage, and are in an executive, administrative, or similar function.[5] In addition, the jobs cannot have existed 90 days prior to the beginning of the investment period, and must be filled during the investment period. The investment period begins one year before construction and lasts one year following the completion of any construction, and cannot be longer than six years.

Any company meeting these requirements can claim a credit in the amount of all sales and use taxes paid on qualified personal property directly related to the creation of the jobs. This includes all building materials, machinery, equipment, furniture and fixtures purchased or leased to construct the facility, as well as any computer software necessary to perform the work functions done in the facility.

5. For the definitions of the types of jobs affected and the specified benefits that must be provided, see Tennessee statute 57-7-22

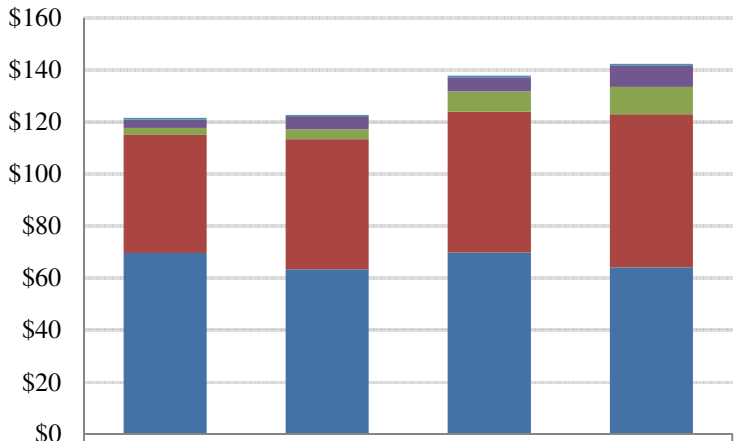
III.Recent Trends in Tennessee Business Tax Credits

In this section, we summarize the use of business tax credits in Tennessee, including the amount claimed by credit. We then present the breakdown of the tax credits claimed by industry and by location. We also provide information on economic characteristics of companies that claimed business tax credits.

We make a distinction between a company *receiving* a credit and *claiming* a credit. A company receives, or is awarded, a credit when it has become eligible for the credit. A company *claims* a credit when it uses at least a portion of the previously-awarded credit to reduce its tax liability during a particular year. Since some credits have a carry forward period, many companies do not claim the entire amount they are awarded during the year they received a credit.

BUSINESS TAX CREDITS CLAIMED

FIGURE 5. Amount of Business Tax Credits Claimed by Credit Type, 2011-2014 (millions)



	2011	2012	2013	2014
Small Business and Rural Opportunity Funds Credit	$0.7	$0.5	$0.6	$0.6
Community Investment Credit	$3.2	$5.0	$5.4	$8.2
Headquarters Credit - Sales Tax	$2.7	$3.8	$7.7	$10.5
Jobs Tax Credits	$45.4	$50.0	$54.2	$58.9
Industrial Machinery Credit	$69.6	$63.3	$69.8	$64.1
Total	$121.6	$122.7	$137.8	$142.4

Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

In Figure 5 above, we present a summary of the business tax credits that were claimed from 2011 through 2014. In 2014, businesses in Tennessee claimed $140 million in tax credits, a 17% increase from the amount claimed in 2011.

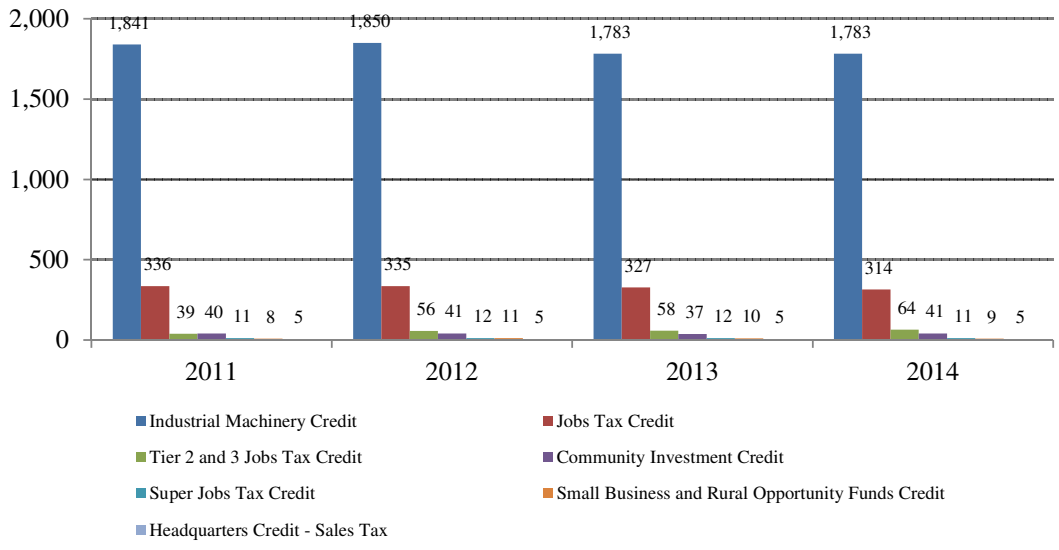
Industrial machinery credits and job tax credits are the two largest tax credits based on the overall volume of credits claimed. The $123 million claimed for these two credits represent about 86% of the total amount claimed in 2014. This share has gradually declined since 2011, when these two credits represented 95% of the total credits claimed.

The industrial machinery credit and standard job credit both have a carryover period of 15 years. This is the longest carryover period out of all franchise and excise tax credits. In 2014, the carryover of unclaimed credits from prior years for the industrial machinery credit totaled $629 million and the carryover for the standard jobs credit totaled $171 million.

COMPANIES THAT CLAIMED BUSINESS TAX CREDITS

In Figure 6 below, we present the number of taxpayers that claimed business tax credits from 2011 through 2014. The industrial machinery credit had the largest number of claimants, with nearly 1,800 in 2014. The standard jobs tax credit has the second largest number of claimants, at over 300 taxpayers annually. About 40 to 60 companies have claimed the Tier 2 and 3 jobs tax credit annually, while about 11 companies claimed the super jobs tax credit annually. There have been roughly 40 claimants annually for the community investment credit, about 10 claimants annually for the small business and rural opportunity funds credits, and five claimants annually for the headquarters sales tax credit.

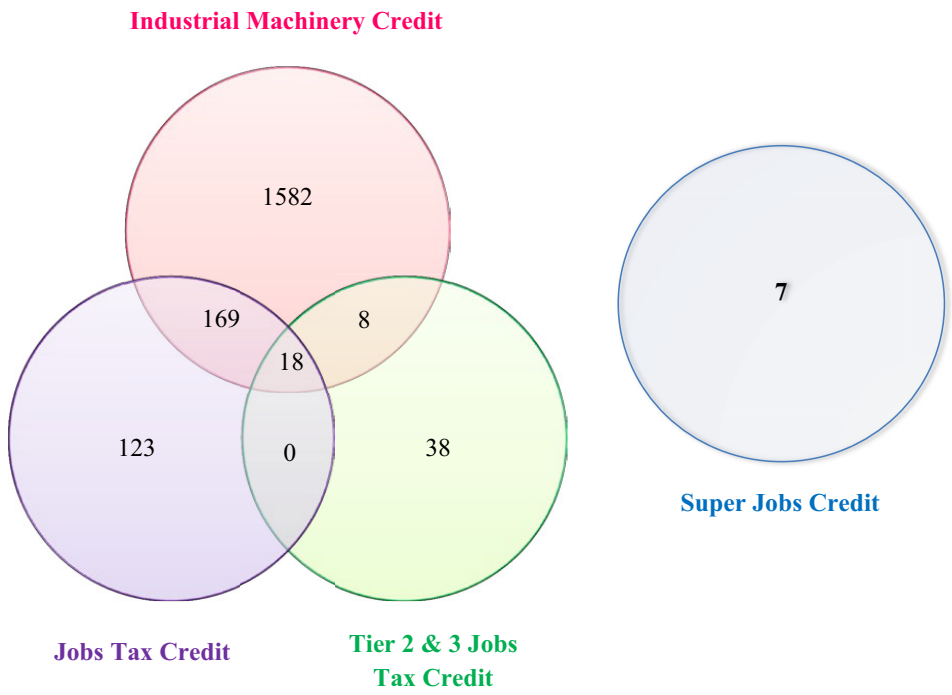
FIGURE 6. Number of Taxpayers that Claimed Business Tax Credits by Type, 2011-2014



Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC
Note: Some taxpayers claimed multiple types of business tax credits.

In 2014, there were 1,954 unique taxpayers that claimed the jobs tax credits, the industrial machinery credit, and the headquarters sales tax credit.[6] Figure 7 below presents the various combinations of tax credits that these businesses claimed. The numbers in the figure correspond to the number of companies that claimed the corresponding combination of credits in 2014. Companies claiming the headquarters sales tax credit were excluded due to data suppression.[7]

FIGURE 7. Combinations of Taxpayers that Claimed Business Tax Credits by Type, 2014



Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

As we show in the figure, 1,582 businesses claimed only the industrial machinery credit, 123 businesses claimed only the standard jobs tax credit, 38 businesses claimed only the Tier 2 and 3 jobs tax credit, and seven businesses claimed only the super jobs credit.[8] About 169 companies claimed both the jobs tax credit and the industrial machinery credit, while 18 companies claimed both

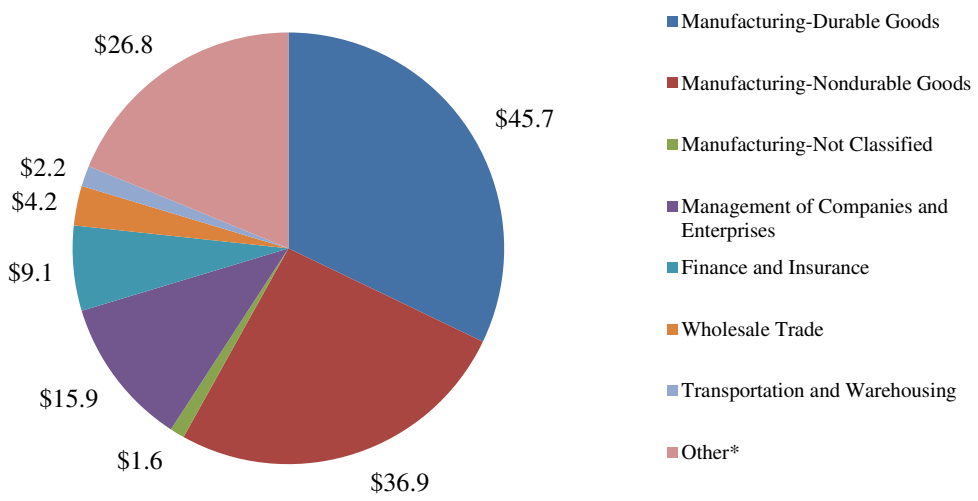
6. Companies that claimed the community investment fund credit, rural opportunity fund credit, and small business opportunity fund credit are excluded from this list. The companies that are eligible for these credits are distinct from those that are eligible for the other types of credits.
7. In addition to the five taxpayers that claimed the headquarters sales tax credit, another four taxpayers were excluded due to data suppression.

of these credits and the Tier 2 and 3 jobs tax credit. Eight companies claimed both the industrial machinery credit and the Tier 2 and 3 jobs tax credit.

BUSINESS TAX CREDITS CLAIMED BY INDUSTRY

In Figure 8 below, we break down claimants of business tax credits in 2014 by industry. Of the $142 million in credits claimed, about 59% was claimed by firms in the manufacturing sector. Firms that manufacture durable goods received about 32% of the total credits, while firms that manufacture nondurable goods received 26% of the total.

FIGURE 8. Amount of Business Tax Credits Claimed by Industry, 2014 (millions)



Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

Companies in the "Other" category include those that were not classified due to missing industry codes, as well as those in industries other than those listed in the legend of this figure.

The next largest category of firms that received business tax credits are those in the "management of companies and enterprises" sector. These firms represent about 11% of the tax credits claimed in 2014. Firms in "finance and insurance" follow with 6% of the credits claimed, while firms in "wholesale trade" represent 3% and firms in "transportation and warehousing" represent 2% of credits claimed. Nearly 20% of the credits were claimed by companies that were in industries other than those listed.

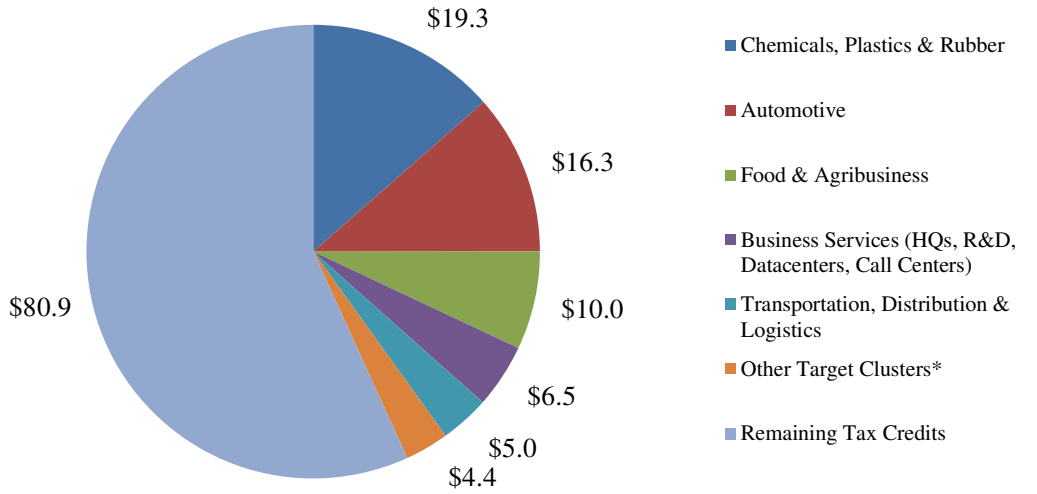
8. Companies awarded both the Tier 2 and 3 jobs tax credit and the standard jobs tax credit claim the Tier 2 and 3 credit first since the Tier 2 and 3 jobs tax credit can be applied to the entire tax liability and expires after a year.

BUSINESS TAX CREDITS CLAIMED BY TARGET CLUSTER

The State of Tennessee focuses its recruitment efforts on target clusters as one of its key strategies to make Tennessee the number one location in the Southeast for high-quality jobs. These target clusters include:

- automotive;
- chemicals, plastics and rubber;
- aerospace and defense;
- transportation, logistics and distribution services;
- business services, headquarters, and research & development;
- healthcare and medical devices;
- energy technologies;
- food and agribusiness; and
- entertainment and media.

FIGURE 9. Amount of Business Tax Credits Claimed by Target Cluster, 2014 (millions)



Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

"Other Target Clusters" includes "energy technology," "aerospace and defense," "health care and medical devices," and "entertainment and media."

Figure 9 above presents the amount of tax credits claimed in 2014 by target cluster. Companies in target clusters claimed at least 40% of the total $142 million in business tax credits claimed.[9] About 14% of the total was claimed by

9. This is a conservative estimate for the credits claimed by companies in target clusters since some credits may have been allocated under "remaining tax credits" due to data suppression.

businesses in the "chemicals, plastics, and rubber" cluster. The next largest category of firms were those in the "automotive" cluster, which represented 11% of the total credits claimed. The third largest target cluster of tax credits was "food and agribusiness" with 7% of credits claimed.

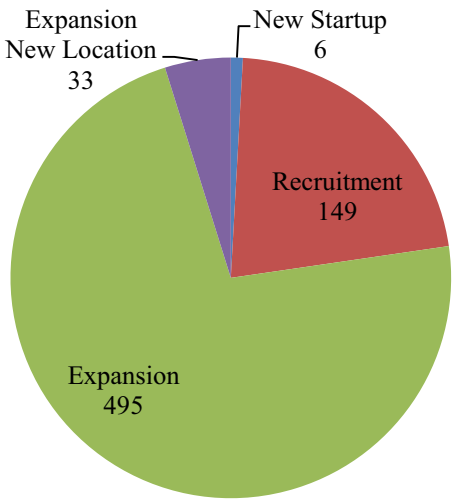
BUSINESS TAX CREDITS CLAIMED BY COMPANIES WITH ECD PROJECTS

Many businesses are awarded tax credits as part of a project with ECD. A project with ECD may involve one of the following activities:

1. New start-up
2. Relocation or recruitment of existing business to Tennessee (recruitment)
3. Expansion of existing business in Tennessee (expansion)
4. Expansion of existing business in Tennessee to a new location (expansion new location)

Businesses with an ECD project may receive tax credits as part of an incentive package that also includes FastTrack grants.[10] The FastTrack program assists companies with relocation and training of new employees and helps communities develop public infrastructure to assist expanding or relocating companies. As the annual budget for FastTrack grants is limited, business tax credits effectively allow the ECD to provide larger incentive packages.

FIGURE 10. ECD Projects, by Project Type, 2011-2014



Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

10. ECD has also awarded capital grants for a handful of significant projects.

From 2011 through 2014, there were 683 ECD projects with businesses in Tennessee. In Figure 10 on page 24, we present the breakdown of these projects by type. Over 90% of these projects entail either an expansion of an existing business in Tennessee (72%) or recruitment of an existing business from another state to Tennessee (22%). In aggregate, businesses with these projects committed to creating over 85,000 jobs and over $15.4 billion in capital investment. The ECD, in turn, has committed nearly $320 million in FastTrack grants for these projects.[11]

From 2011 through 2014, over 60% of the total business tax credits were claimed by businesses with an ECD project. This figure includes businesses that landed a project prior to 2011 and therefore are not reflected in Figure 6 on page 20. Each type of tax credit discussed in "Business Tax Credits Claimed" on page 19 was claimed by at least some businesses with an ECD project except for the community investment credit and the small business and rural opportunity funds credit.

Figure 11 on page 26 presents the share of business tax credit claimants with an ECD project, as well as the share of credits claimed by these businesses.[12] The headquarters sales tax credit is the only tax credit in which all of the businesses that claimed the credit also had a project with ECD.

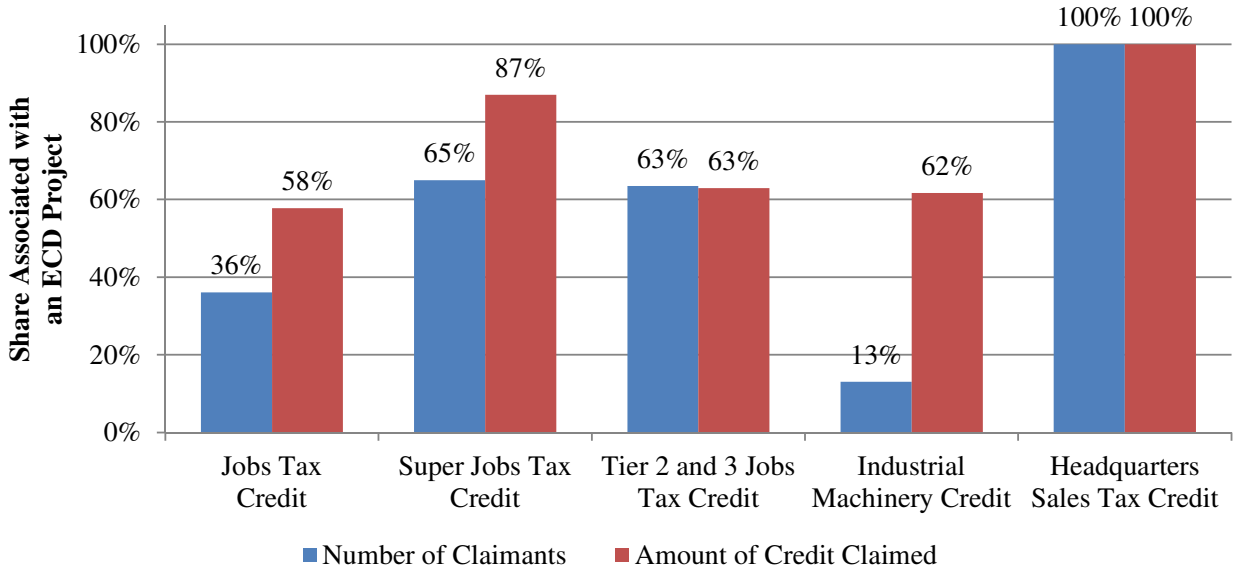
For the most common credits—the standard jobs credit and industrial machinery credit—businesses with an ECD project represented a minority of the businesses that claimed these credits (36% and 13%, respectively). However, these businesses claimed a majority of these credits (58% and 62%, respectively). This indicates that businesses with an ECD project claimed more credit per business, on average, than those that did not have an ECD project.

For the super jobs credit, businesses with an ECD project claimed nearly 90% of the total credit claimed, but represented 65% of the businesses claiming the credit. Other than the headquarters credit, the Tier 2 and 3 jobs credit is the only one in which the share of businesses and the credit claimed associated with an ECD project were roughly the same.

11. ECD has also committed nearly $230 million in capital grants for four of these projects that involved significant job and capital investment commitments. These grants were awarded to Volkswagen Group of the Americas, Beretta USA Corporation, Hankook Tire Co. Ltd., and Eastmand Chemical Company.

12. In this figure, the share of claimants with an ECD project is based on data that represents roughly 100% of the unique taxpayers that claimed each credit from 2011 through 2014, except for the industrial machinery credit. The share of industrial machinery credit claimants with an ECD project is based on data that represents 96% of the unique taxpayers that claimed the credit during this period.

FIGURE 11. Share of Claimants and Amount Claimed by Companies with ECD Projects, 2011-2014

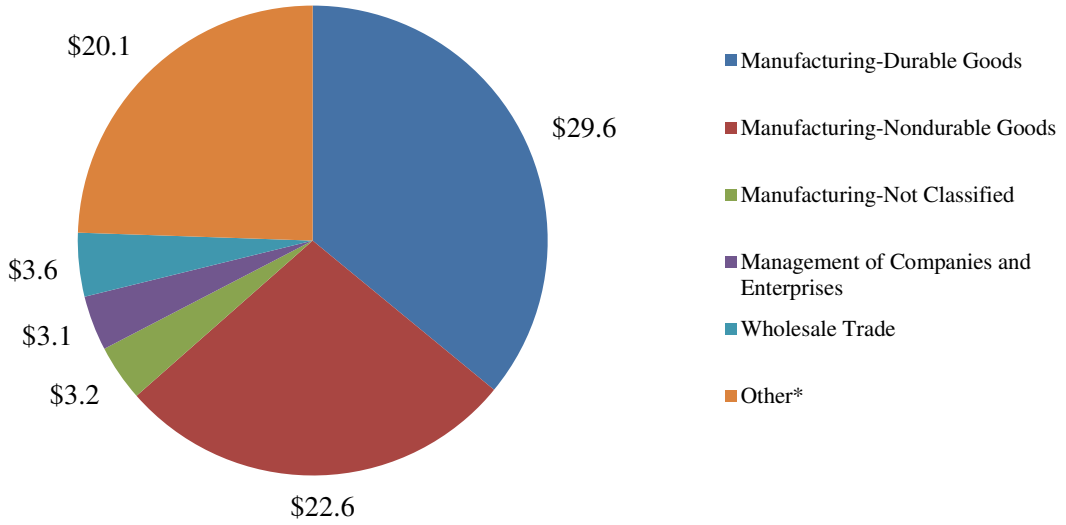


Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

Note: The share of taxpayers that landed a project with ECD is based on the taxpayers who used the respective credits at any time from 2011 through 2014 and filed a return in 2012, which may exclude companies that did not exist in 2011, 2013, or 201. This year best represented the number of unique taxpayers who used each type of credit from 2011 through 2014.

Figure 12 on page 27 presents a breakdown of the tax credits claimed by industry of businesses that had an ECD project in 2014. About $82 million in business tax credits were claimed by businesses with an ECD project. Of this, about $55 million—nearly 70%—was claimed by manufacturing businesses. After excluding the community investment credit and small business and rural opportunity funds credits, this share is roughly the same for businesses that did not have an ECD project. Businesses in "management of companies and enterprises" and "wholesale trade" each claimed about 4% of the $82 million in credits, while businesses in other industries claimed about 24% of the credits.

FIGURE 12. Amount of Business Tax Credits Claimed by Industry of Companies with an ECD Project, 2014 (millions)



Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

Companies in the "Other" category include those that were not classified due to missing industry codes, as ell as those in industries other than the sectors listed in the legend of this figure.

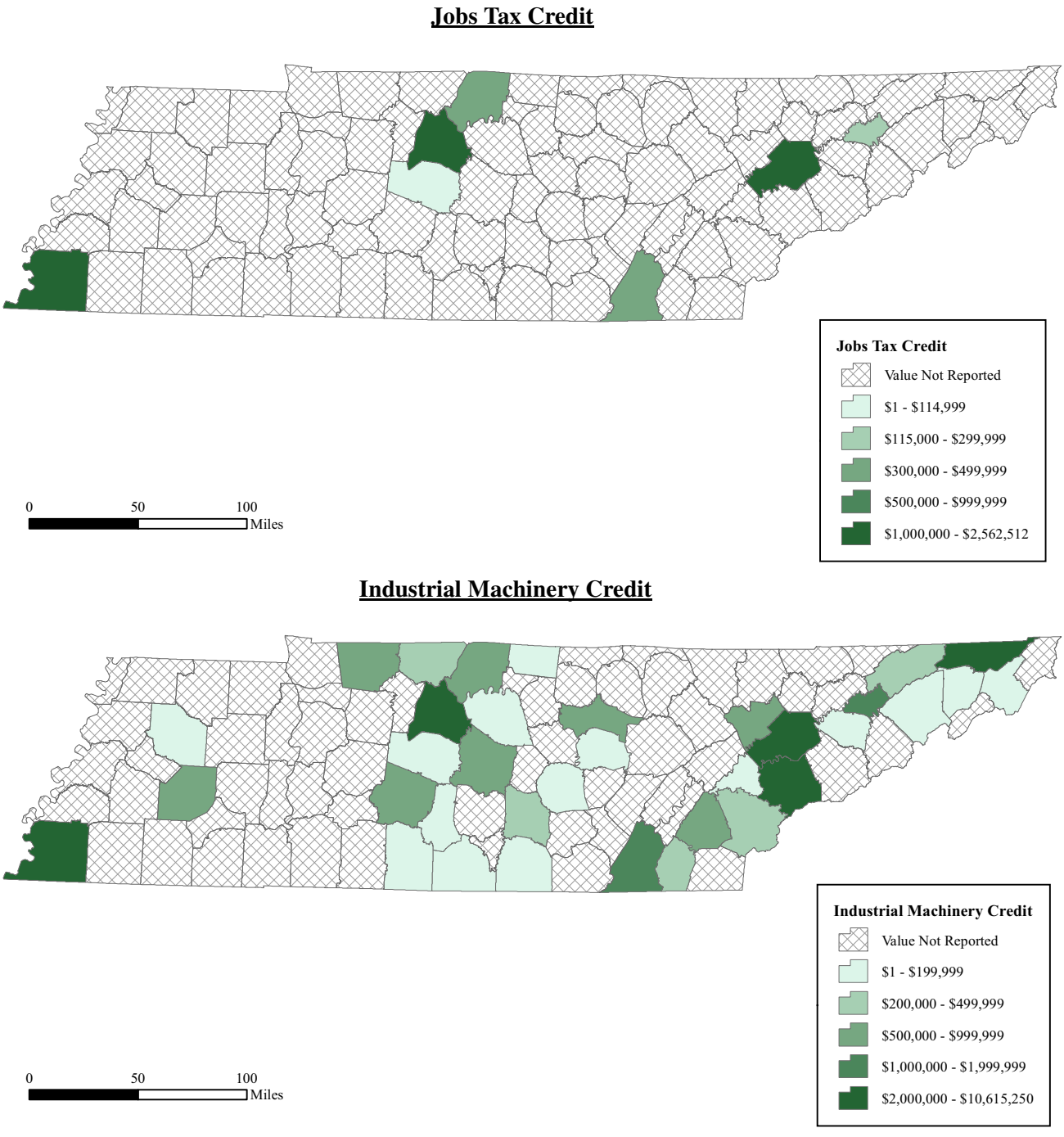
Business Tax Credits Claimed by Location

In Figure 13 on page 28 we present the standard jobs tax credit and industrial machinery tax credit claimed in 2014 by county.

Businesses in seven counties represented over 30% of the standard jobs tax credit claimed, and businesses in 34 counties represented over 70% of the industrial machinery credit claimed. The amount claimed in the remaining counties are not reported due to data suppression.

Shelby and Knox Counties were the largest counties for jobs tax credit claims, representing $2.6 millions and $2.3 million of the amount claimed, respectively. Sullivan and Shelby Counties were the largest counties for industrial machinery credit claims, representing $10.6 million and $6.4 million of the amount claimed, respectively.

FIGURE 13. Amount of Standard Jobs Tax Credits and Industrial Machinery Tax Credits Claimed by County, 2014

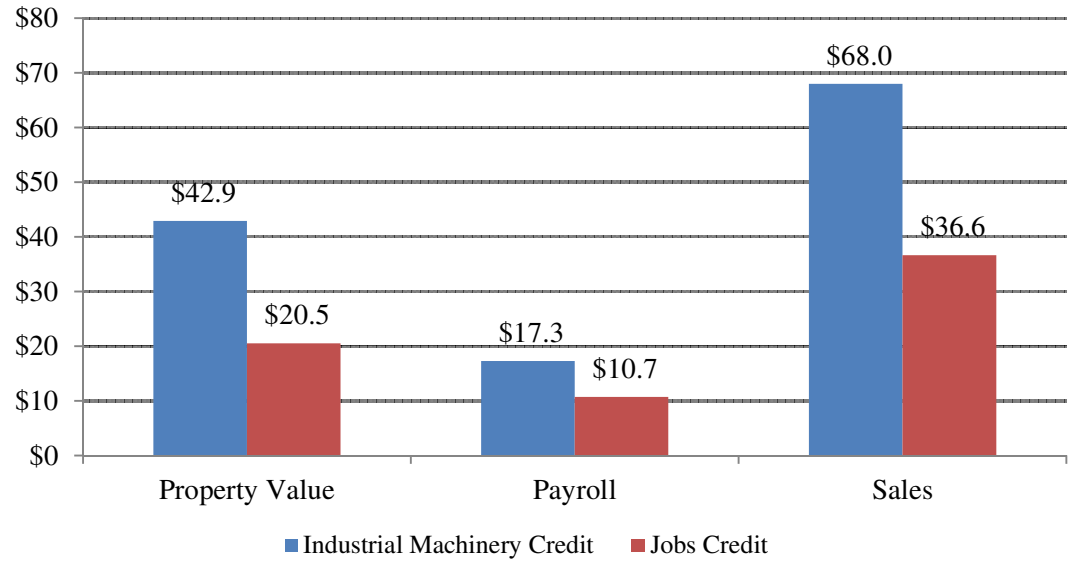


Source: Tennessee Department of Economic and Community Development
Analysis: Anderson Economic Group, LLC

ECONOMIC CHARACTERISTICS OF COMPANIES THAT CLAIMED BUSINESS TAX CREDITS

In Figure 14 below, we present estimates for the property value, sales, and payroll in Tennessee for companies that claimed the industrial machinery credit and the standard jobs credit, respectively, in every year from 2011 through 2014.[13] The estimates in the figure represent the values for the year 2014.

FIGURE 14. Property Value, Sales, and Payroll in Tennessee for Companies that Claimed Business Tax Credits, 2014 (billions)



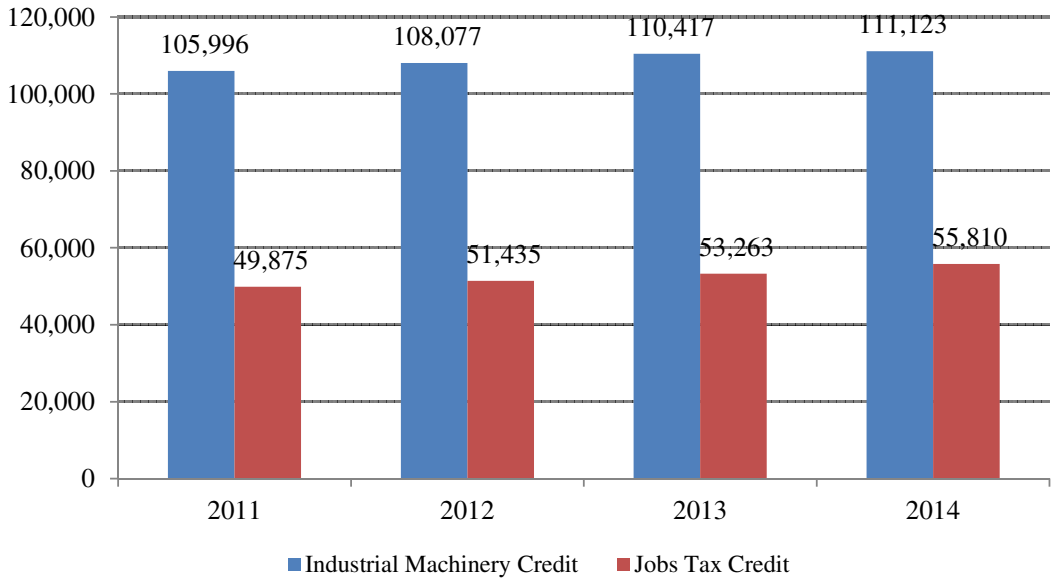
Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group, LLC

Note: Because there may be overlap between companies receiving the jobs credit and industrial machinery credit, it would not be appropriate to add the measures for each credit together to get the total.

Firms that claimed the industrial machinery credit own nearly $43 billion in real and personal property in Tennessee, compared to $21 billion in property owned by firms that claimed the standard jobs tax credit. Employees at the firms that claimed the industrial machinery credit earned a total of $17 billion in compensation and employees at the firms that claimed the jobs credit earned $11 billion in compensation. Finally, firms that claimed the industrial machinery credit made $68 billion in sales, while the firms that claimed the jobs credit made nearly $37 billion in sales. (The actual totals are much higher than shown since not all companies were required to report this information.)

13. This figure represents companies that provided complete payroll information. These estimates represent 73% of companies that claimed the standard jobs credit between 2011 and 2014. These companies claimed 83% of the standard jobs credits claimed in 2014. These estimates represent 45% of the companies that claimed the industrial machinery credit between 2011 and 2014. These companies claimed 93% of the industrial machinery credits claimed in 2014.

FIGURE 15. Employment in Tennessee for Companies that Claimed Business Tax Credits in All Years, 2011 to 2014



Source: Tennessee Department of Revenue, Department of Labor and Workforce Development
Analysis: Anderson Economic Group, LLC

Note: Because there may be overlap between companies receiving the jobs credit and industrial machinery credit, it would not be appropriate to add the measures for each credit together to get the total.

In Figure 15 above, we present estimates for employment in Tennessee from 2011 through 2014 for companies that claimed the industrial machinery credit and the standard jobs credit.[14] As we show in the exhibit, firms that claimed the industrial machinery credit employed 111,000 people in Tennessee in 2014, compared to nearly 56,000 employed by companies that claimed the jobs credit.[15] Employment at companies that claimed the industrial machinery credit increased by over 1% annually since 2011, while employment at companies that claimed the jobs credit increased by nearly 3% annually.

14. This figure represents companies that filed returns every year from 2011 through 2014 and provided complete information. These estimates represent 44% of companies that claimed the standard jobs credit, claiming 57% of the standard jobs credits claimed during the four-year period. These estimates represent 30% of the companies that claimed the industrial machinery credit, claiming 64% of the industrial machinery credits claimed during the four-year period.

15. Based on data for all companies that claimed these credits, companies that claimed the industrial machinery credit employed over 216,000 workers in Tennessee in 2014, while companies that claimed the standard jobs credit employed over 109,000 workers. These totals include companies that did not file a return every year or did not provide complete information.

IV.Economic Impact of Tennessee's Business Tax Credits

In this section, we discuss the economic impact of each tax credit described in "Business Tax Credits in Tennessee" on page 14. In each case, we discuss in detail some headline statistics about each credit's usage over the past few years. We then show, if applicable, an analysis on how that credit has had an impact on Tennessee's economy over that time period, and we share findings from our detailed literature review to put our analysis into the proper context.

ECONOMIC IMPACT DEFINED

We define the net economic impact of a business tax credit in Tennessee as the additional economic activity occurring in the state that would not happen in the absence of the business tax credit. In estimating the net impact, we follow a careful methodology that considers only the spending or employment that would be *net new* to the region due to the tax credit.

Economic activity that is *net new* is activity that would not have happened in the absence of the credit. For example, some businesses would likely have hired new employees even if they could not claim the jobs tax credit. Those employees that would have been hired anyway are not included in the economic impact of the jobs tax credit. Where possible, we estimate the economic impact of the credits in terms of output (spending), employment, and earnings.

Tax credits can have direct impacts upon the recipient of the credit, for example by inducing that company to employ more people or purchase more equipment in Tennessee. As the Tennessee vendors or employees that benefit from this new activity increase their own expenditures, more funds will circulate throughout the region, resulting in additional indirect impacts.

Limitations. There are two important ways in which we were unable to capture the extent to which economic activity induced by these credits is *net new*. First, we do not attempt to identify and estimate the counterfactual use for government funds provided in the form of credits. As we note in "Recent Trends in Tennessee Business Tax Credits" on page 19, $140 million in tax credits were claimed by Tennessee businesses in 2014. We have not made any assumptions about how that money may have been used in the absence of the credits, and therefore cannot compare the economic impact of the credits to a counterfactual use of the funds provided for them. Policymakers should compare the economic impacts summarized in this section to other alternatives, such as broader-based tax cuts totaling $140 million, $140 million in additional health care or education spending, or other potential scenarios.

Second, the credits we evaluate in this report are often provided as part of a package of credits and grants assembled by the ECD to attract companies relocating to the state or to encourage expanding companies to remain in the state. As such, these

credits augment the tools available to the ECD to attract and retain businesses. We were not provided with firm-level data on the scale and nature of tax credits provided, and there is no "but-for statement" required of companies receiving these packages. Therefore, we cannot identify whether firms relocating or expanding in the state would have done so in the absence of the ECD package and the extent to which the credits played a role in that decision.

In sum, their use as a supplement to ECD packages is a potentially important way in which these credits have an economic impact, but we do not capture this component of their economic impact in this report. For details on the use of business tax credits in Tennessee by companies with ECD projects, see "Business Tax Credits Claimed by Companies with ECD Projects" on page 24.

Due to the nature of the data available, we were only able to quantify the economic impact of tax credits in some cases. For confidentiality reasons, we were unable to acquire data on individual firms, which considerably curtailed the methodological options at our disposal. For a detailed description of the methodology behind the analyses in this chapter, see "Appendix A. Methodology" on page A-1.

JOBS TAX CREDIT

From 2011 to 2014, over 41,000 new qualified jobs were created at companies claiming the jobs tax credit for a total credit amount of $208 million, as we show in Table 5 on page 33. Companies are allowed to carry forward unused jobs tax credits for 15 years. During the 2011 to 2014 time period, companies carried forward an average of $150 million per year in credits, were awarded an additional $49 million in credits each year, and claimed $200 million each year. On average, firms claimed about 14.2% of the total available jobs tax credits in a given year.

Qualified businesses in Tennessee also receive an additional credit per job if they locate in a designated Tier 2 or Tier 3 county, or make a minimum investment of $100 million (super job credits). As reported in Table 6 on page 33 and Table 7 on page 34, 40.1% to 58.5% of Tier 2 and Tier 3 credits and 38.9% to 52.7% of super job credits were claimed in each year from 2011 and 2014. While these credits can be applied against 100% of F&E liabilities, any unused portion expires in the year it is generated and cannot be carried forward to a new tax year.

Note that the Tier 2 & 3 credit and super jobs tax credit can be collected over multiple years for the same job, so some of the credits claimed and "new jobs" numbers in the above tables represent the same employee from one year to the next. Also, as we show in Figure 7 on page 21, there is some overlap in companies claiming each of these credits. Notably, however, companies that claim the Tier 2 and 3 tax credits in 2014 did not claim standard jobs tax credits because their tax liability was not high enough to claim all credits.

TABLE 5. Standard Jobs Tax Credit, 2011 to 2014

	2011	2012	2013	2014
Companies Making Claims	486	493	476	472
Awarded in Current Year	$52.8 million	$52.4 million	$43.8 million	$46.9 million
Carryover from Previous Year	$120.3 million	$151.4 million	$160.0 million	$170.5 million
Total Available	$173.2 million	$203.8 million	$203.8 million	$217.4 million
Total Claimed	$27.8 million	$27.4 million	$27.9 million	$29.7 million
% of Awarded in Current Year	53.0%	52.2%	63.8%	63.4%
% of Total Available	16.0%	13.4%	13.7%	13.7%
Number of New Jobs	11,514	11,344	8,531	10,267
Effective Tax Saving per Job	$2,412	$2,413	$3,274	$2,893

Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group

TABLE 6. Tier 2 & 3 Jobs Tax Credit, 2011 to 2014

	2011	2012	2013	2014
Companies Making Claims	88	93	92	88
Total Awarded	$17.6 million	$22.9 million	$20.2 million	$20.7 million
Total Claimed	$7.0 million	$9.2 million	$11.8 million	$10.2 million
%	40.1%	40.3%	58.5%	49.0%
Number of New Jobs	3,909	5,097	4,481	4,611
Effective Tax Savings per Job	$1,798	$1,814	$2,633	$2,206

Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group

TABLE 7. Super Jobs Tax Credit, 2011 to 2014

	2011	2012	2013	2014
Companies Making Claims	19	20	19	20
Total Awarded	$23.7 million	$34.5 million	$35.4 million	$36.0 million
Total Claimed	$10.6 million	$13.4 million	$14.5 million	$19.0 million
%	44.7%	38.9%	41.0%	52.7%
Number of New Jobs	4,749	6,906	7,084	7,207
Effective Tax Savings per Job	$2,233	$1,944	$2,048	$2,635

Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group

Jobs Tax Credit for Employing Persons with Disabilities. The jobs tax credit for employing persons with disabilities aims to provide better employment opportunities for disabled job seekers. There is no required minimum investment or minimum number of jobs; all businesses in Tennessee qualify. However, the program appears to have had no actual effect on employment because of low program participation. During 2011 to 2014, only four businesses claimed this credit, totaling $50,000 in credit claimed for 11 positions created.

The low number of claims may be a result of lack of incentives. For many businesses, the size of the credit is small relative to the size of investment required to provide accommodations for disabled workers. To promote work opportunities, some alternative approaches worth considering would be subsidizing skill-specific training programs or funding workforce connection centers which provide employment-related services to people with disabilities.

Employment at Jobs Tax Credit Recipients

While it is clear that companies that received jobs tax credits created jobs, it is less clear whether they created jobs *because of* the credit. It is impossible to know for sure whether these companies would have created jobs even in the absence of the credit, but one way to shed light on this question is to see how companies that received jobs tax credits compared to their peers in employment growth.

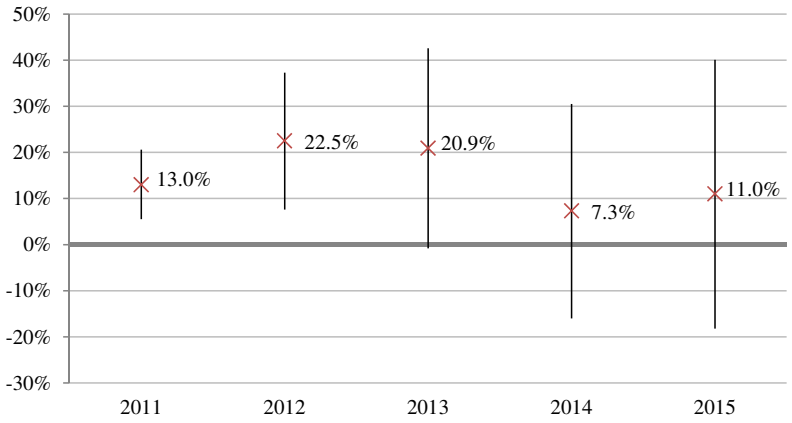
In Figure 16 on page 35, we show the employment growth over time at companies that received the jobs tax credit, relative to companies that did not, controlling for industry. For this analysis, we determined employment growth since 2010 at companies that received a credit in the year 2011. We then compare these estimates to employment growth since 2010 at other companies that existed in 2011 but did not receive the credit. We repeated this same analysis but

for companies receiving a credit in 2012 to ensure that one year's results were not an anomaly.

Figure 16 below and Figure 17 on page 36 show the 95% confidence interval, as it is a standard statistical convention to determine statistical significance. Applied here, it means that there is a 95% chance that the growth rate for employment relative to the industry average for companies receiving the credit will fall within the particular range shown in each given year.[16]

Companies that receive the credit increase employment about 20% faster than the industry average within a year of being awarded the credit. By three years after being awarded the credit, they retain a 10% to 15% edge, on average, but this effect is not significant. At that point, companies that were awarded the jobs tax credit are almost as likely to have fallen behind the industry average in employment growth as they are to have remained ahead. This suggests that firms that claim the jobs tax credit tend to cluster hiring in the year in which they are eligible for the credit and then make fewer hires in subsequent years, relative to their peers.

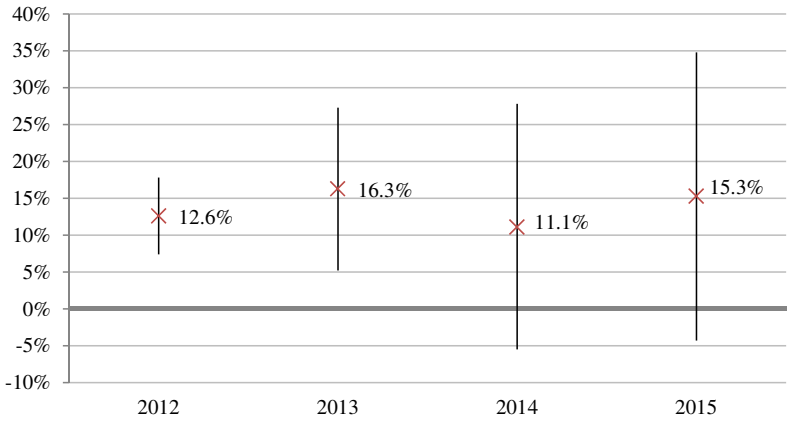
FIGURE 16. Growth in Employment Since 2010 for Companies Awarded the Jobs Tax Credit in 2011, Difference from Industry Average



Source: AEG analysis based on data provided by the Tennessee Department of Revenue and Tennessee Department of Labor and Workforce Development.

16. Because we perform a separate regression for multiple years, we should use a higher standard than the 95% confidence interval for statistical significance. A Bonferroni correction would require that we expand the confidence interval to a 99.7% range before declaring a result significant. Even after making this adjustment, there is no change in which years yield statistically significant results and which do not. For a complete description of our analytical methods and this correction, see "Bonferroni correction" on page A-1

FIGURE 17. Growth in Employment Since 2011 for Companies Awarded the Jobs Tax Credit in 2012, Difference from Industry Average



Source: AEG analysis based on data provided by the Tennessee Department of Revenue and Tennessee Department of Labor and Workforce Development

Companies receiving the tax credit in 2011 had a total of 35,100 employees prior to receiving the credit. A 20% increase in employment would total about 7,000 jobs. Applying the same math to companies that received the tax credit in 2012 gives an estimate of 9,400 jobs. When we consider that this effect lasts approximately two years, and that there is some overlap between the two sets of companies, the result is that companies claiming the jobs tax credit provide approximately 15,000 more jobs than if they had grown at the rate of their counterparts in any given year during this time period.

It is important to note that this analysis does not provide evidence that the jobs tax credit *caused* this relative increase in employment. Companies that apply for and receive the jobs tax credit are already planning on growing, and may or may not have grown at the same rate in the absence of the credit. Especially since there is no but-for statement (see "But-for statements" on page 13), there is reason to be skeptical that any increase in jobs at firms receiving the credit were actually induced to hire more workers by the availability of the credit.

Elasticity Analysis. Employers take advantage of the jobs tax credit because it reduces the cost of labor. The net cost of compensation over the course of an employee's career is the cost of the employee's compensation *minus* the amount of jobs tax credit that can be claimed for hiring that employee.

We determined that the average cost of compensation for a private sector employee in Tennessee, over the entire course of their tenure at a company, is $244,310.[17] Meanwhile, the average jobs tax credit claimed per new employee, as calculated in Table 5 on page 33, was $2,748 during the time period from

2011 to 2014. That is a reduction of 1.12% in the total cost of an average employee's compensation.

Across a broad range of research studies, on average, researchers find that for every 1% decrease in the cost of labor, employment will go up by about 0.5%.[18] If that applies here, we would expect that companies taking advantage of this tax credit would employ about 0.57% more people than they otherwise would. Using information about new hires at firms that claimed the credit in 2014, that would come out to about 250 jobs. Table 8 below shows our estimates for jobs created due to the jobs tax credit over time for each type of jobs tax credit, using this method.

This is a conservative estimate, since it involves several conservative assumptions to arrive at it. For example, for the Tier 2 & 3 jobs tax credit and the super jobs tax credit, we assume that the credit will be claimed for three years and four years, respectively, of the employee's tenure.

TABLE 8. Jobs Directly Created due to Jobs Tax Credits, 2011 to 2014

	Increase in Hiring	2011	2012	2013	2014
Standard Jobs Tax Credit	0.57%	65	64	48	58
Tier 2 & 3 Jobs Tax Credit	1.32%	51	66	58	60
Super Jobs Tax Credit	1.84%	86	125	128	130
TOTAL		**202**	**256**	**235**	**249**

Source: AEG analysis based on data provided by the Tennessee Department of Revenue, Tennessee Department of Labor and Workforce Development, and Bureau of Labor Statistics.

Over the past few years the reduction in the cost of labor for companies receiving the jobs tax credit has resulted in an estimated additional 235 jobs per year, on average. These additional jobs at companies receiving the jobs tax credit are the *direct* economic impact of the jobs tax credit. There is also an indirect impact. Greater employment means greater earnings for Tennessee residents, and those residents can increase their purchases at local businesses. This higher demand for goods at local businesses has its own effect on the local economy as those businesses increase purchases from their suppliers and hire new employ-

17. For more information on how we derived this estimate, see "Elasticity Analysis for Jobs Tax Credit" on page A-3.

18. Andreas Lichter, Andreas Peichl, and Sebastian Siegloch, "The Own-Wage Elasticity of Labor Demand: A Meta-Regression Analysis," *Institute for the Study of Labor Discussion Paper Series*, No. 7958, February 2014.

ees themselves. We summarize the indirect impact caused by increased payroll at Tennessee businesses in Table 9 below.

TABLE 9. Indirect Impact of Jobs Tax Credits in Tennessee, 2011 to 2014 (dollar amounts in millions)

		2011	2012	2013	2014
Increase in Payroll at Companies Receiving Jobs Tax Credits		$24.8	$34.1	$34.2	$39.5
INDIRECT IMPACTS	Employment	272	374	376	434
	Earnings	$9.9	$13.7	$13.7	$15.8
	Output	$33.8	$46.5	$46.7	$54.0

Source: AEG analysis based on data provided by the Tennessee Department of Revenue, Tennessee Department of Labor and Workforce Development, Bureau of Labor Statistics, and Bureau of Economic Analysis
Note: Payroll is not directly comparable to direct employment estimates because more companies provided payroll data than employment data.

When we add these indirect impacts to the direct impacts of employment estimated in Table 8 on page 37, we obtain the following estimates for total annual economic impact, on average, of the jobs tax credits provided in Tennessee from 2011 to 2014.

TABLE 10. Average Annual Economic Impact of Jobs Tax Credits in Tennessee, 2011 to 2014

	Direct	Indirect	Total
Employment	235	364	600
Earnings	$33.1 million	$13.3 million	$46.4 million
Output	$0	$45.3 million	$45.3 million

Source: AEG analysis based on data provided by the Tennessee Department of Revenue, Tennessee Department of Labor and Workforce Development, Bureau of Labor Statistics, and Bureau of Economic Analysis

Economic Research on Jobs Tax Credits

We performed an extensive review of research on the impact of jobs tax credits like those provided in Tennessee. See "Literature Review" on page C-3 for a list of studies that we reviewed.

Almost all studies that we reviewed found no significant impact or sometimes even a negative impact due to tax credits. However, these studies were often looking at *state-level* effects on employment. It is possible that the anticipated state-level effects on employment were simply too small to be determined using the techniques available to researchers. For example, in 2014, companies claim-

ing the standard jobs tax credit in Tennessee created 10,267 new jobs. Even if all of these jobs were directly created by the jobs tax credit, that is equivalent to only 0.27% of total state employment, and our estimated impact of Tennessee's jobs tax credits is much lower.[19]

One recent study looked at 128 state hiring credits and found that a *refundable* jobs tax credit is the only type of incentive that has a measurable positive impact on employment.[20] Significant at a 90 percent confidence interval, a refundable jobs credit was associated with a 0.44% increase in state employment. The same study also found a significant effect when credits were paired with a clawback provision. For all other types of jobs tax credits, the estimated effects were negative but statistically insignificant.

It makes sense that refundable credits would provide a greater incentive. Companies can claim the full credit whether they have a high tax liability or not. This provides certainty and, often, a larger credit. Refundable credits also do not carry forward to future years. Companies claim them in their entirety in the current year. This allows companies to receive the full value of the credit at a time when they need it most—during their planned hiring expansion—rather than hoping to have sufficient tax liabilities to benefit from the credit 10 years down the road.

It also makes sense that clawback provisions would result in more long-term effects. With strong clawback provisions, only companies that expect to stay in the state for an extended period of time will apply for the credit. When paired with refundability, clawback provisions make it so that the upfront credit can still be used to incentivize employment over several years.

None of the four job tax credits offered in Tennessee is refundable, and clawbacks in Tennessee only occur when companies subject to an audit have misestimated their employment and therefore requested the wrong amount of credits.

Tier 2 & 3 Jobs Tax Credit. The Tier 2 and 3 jobs tax credit provides an additional incentive to qualified businesses that expand or relocate in tier 2 or tier 3 counties, which are counties with high poverty and high unemployment. It can be difficult for these counties—largely rural areas—to attract startups or business expansions, and this tax credit seeks to counteract that.

A study on the effectiveness of a Georgia jobs tax credit with similar characteristics to the Tennessee credit showed that firms located in less developed coun-

19. Data on Tennessee employment from the Bureau of Economic Analysis, Table SA4, "Personal Income and Employment by Major Component."

20. Diego Grijalva & David Neumark, "The Employment Effect of State Hiring Credits During and After the Great Recession", *National Bureau of Economic Research*, 2013.

ties were not more likely to participate in the program after receiving additional incentives, suggesting that, in at least this instance, these types of incentives are not enough to overcome the forces resulting in disinvestment in these communities.[21]

Credit Structure and Value. All jobs tax credits in Tennessee are paid out over multiple years. In the case of the jobs tax credit, the credit can be carried forward for 15 years, and few companies are able to claim the full amount. In the case of the Tier 2 & 3 and super jobs tax credits, the credit is provided for each year that employees are retained for a period of several years. Research on how businesses value future income suggests a subsidy paid out or claimed over several years is less cost-effective because businesses apply a relatively high discount rate to future income flows.[22] In Table 11 below, we calculate the net present values of a 3-year and a 5-year income stream of $4,500, which reflects the statutory rate of Tennessee's Tier 2 and 3 jobs tax credit, with an average annual discount rate of 25%.[23]

The discounted total credits per job is $8,784 in a Tier 2 county and $12,102 in a Tier 3 county, which is just over half of the face value of the credits. This does not take into account the fact that not all businesses have enough taxable income to claim their credits, so the actual tax savings would be much smaller (and the discount rate would be much higher due to uncertainty about whether the credit can be claimed). As we show in Table 6 on page 33, less than half of tier 2 and 3 jobs tax credits are claimed.

TABLE 11. Discounted Tax Savings from Tier 2 & 3 Jobs Tax Credit

Discount Rate	25%
5-year Cash Flow (Tier 3)	$22,500
Discounted 5 Year Cash Flow	$12,102
3-year Cash Flow (Ti34 2)	$13,500
Discounted 3 Year Cash Flow	$8,784

Analysis: Anderson Economic Group

A multi-period subsidy reduces the value of the tax credit in tier 2 and 3 counties to about half of its statutory level after applying an average discount rate of

21. Dagney Faulk, "Do State Economic Development Incentives Create Jobs?", *National Tax Journal*, 55.2 (June 2002), p. 263.

22. Timothy Bartik, "Taking Preschool Education Seriously as an Economic Development Program: Effects on Jobs and Earnings of State Residents Compared to Traditional Economic Development Programs", *Upjohn Institute*, 2006.

23. This discount rate represents the industry standard for privately-held businesses. Among other sources, see Stanley Block, "The Liquidity Discount in Valuing Privately Owned Companies", *Journal of Allied Finance,* Vol. 17 Issue 2. p. 30-40.

25%. The state could create a greater incentive at little change in cost if it offered qualified businesses an 100% up-front credit payment in year one when the jobs are created. Similar reasoning applies to the standard jobs tax credit. Companies would value the incentive much more if it were provided as an upfront refundable credit rather than a nonrefundable credit that can be claimed over the course of 15 years.

INDUSTRIAL MACHINERY TAX CREDIT

To encourage investment and improve firm competitiveness, the state of Tennessee offers a tax credit on the purchase of industrial machinery. This credit is equal to between 1% and 10% of the purchase price of the qualified industrial machinery and can offset up to 50% of the F&E tax liability. In total over $404 million in industrial machinery credits were awarded from 2011 to 2014. Table 12 below shows the amount of credits awarded in each year, and the amounts claimed in each year. As with the jobs tax credit, industrial machinery credits can be carried forward for 15 years.

TABLE 12. Industrial Machinery Credit, 2011 to 2014 (dollar amounts in millions)

Year	2011	2012	2013	2014	Total
Awarded in Current Year	$126.1	$81.6	$113.5	$82.9	$404.1
Carryover from Previous Years	$201.1	$288.3	$376.3	$515.9	$1,381.5
Total Available	$326.8	$369.6	$489.5	$598.3	$1,784.2
Total Claimed	$56.5	$51.8	$62.3	$59.3	$230.1
% of Current Year	44.8%	63.5%	55.0%	71.6%	56.9%
% of Total Available	17.3%	14.0%	12.8%	9.9%	12.9%
Number of Companies Claiming Credits	1,111	1,167	1,170	1,157	1,605
Total Employment of Claimants	194,343	202,147	211,380	215,718	n/a

Source: Tennessee Department of Revenue
Note: Since employment varied over this period and companies claimed credits over multiple years, we do not have sufficient data to make an estimate for average employment over this time period.

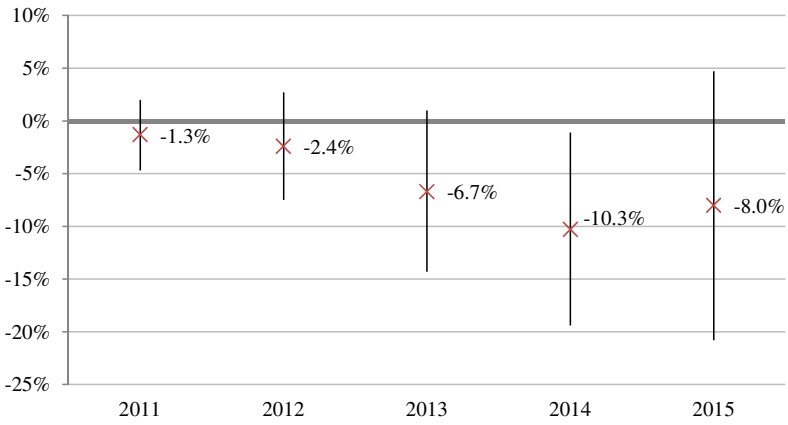
While the amount of industrial machinery credit has fluctuated, the amount of credit carried over each year has grown in every year for the data we have. The credits can only be carried forward for 15 years, and is almost certain that companies receiving the credit will be unable to claim the full amount of available credits. This inability to claim the credit likely reduces its impact on the purchasing decisions of companies.

Employment at Industrial Machinery Tax Credit Recipients

Academic research on the impact of tax credits of this nature suggests that these credits will effectively increase the amount of investment in industrial machinery.[24] The additional capital will allow workers to produce more, which will increase their earnings. Because workers will be more valuable, firms could increase hiring, but they will also be able to replace workers with capital that has been made less expensive due to the tax credit. Because of these two contrary effects, the effect of the industrial machinery credit on employment at firms claiming the credit is ambiguous. In the following subsection, we compare employment trends for recipients of the industrial machinery credit against the trends of their peers.

In Figure 18 below and Figure 19 on page 43, we show the results of our analysis comparing the growth of companies who were awarded the credit to peer companies who were not, controlling for industry. In this analysis, we index employment to a baseline of employment in the year before the credit was awarded. The results show that, on average, the industrial machinery credit does not have a significant effect on employment. In fact, companies that received the industrial machinery credit hired fewer people, on average, than their peers within a few years of receiving the credit.

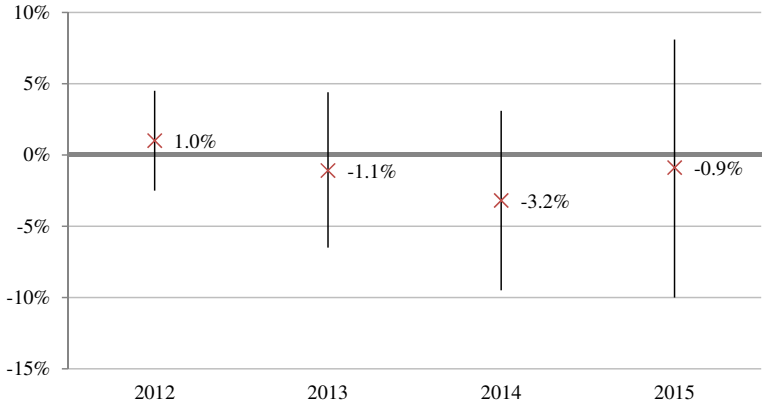
FIGURE 18. Growth in Employment Since 2010 for Companies Awarded the Industrial Machinery Credit in 2011, Difference from Industry Average



Source: AEG analysis based on data provided by the Tennessee Department of Labor and Workforce Development and Tennessee Department of Revenue

24. See "Industrial Machinery Tax Credit Employment Analysis" on page C-1 for a list of sources we reviewed to come to this conclusion.

FIGURE 19. Growth in Employment Since 2011 for Companies Awarded the Industrial Machinery Credit in 2012, Difference from Industry Average



Source: AEG analysis based on data provided by the Tennessee Department of Labor and Workforce Development and Tennessee Department of Revenue

There are two potential explanations for this. First, it is possible that companies that use the industrial machinery credit to purchase more machinery are using additional machinery to cut back on their labor requirements. Second, it is possible that companies that take advantage of the industrial machinery credit were already in a worse position than their peers, such that they would have reduced their employment over time even without the credit. Unfortunately, we do not have sufficient data to determine which of these two is accurate and to what degree.

Impact of Increased Industrial Machinery Purchases

The results in the previous sections suggest that there is no *direct* effect on employment in Tennessee due to the credit. Since the industrial machinery credit results in more investment in the state, there is an *indirect* effect on Tennessee retailers and manufacturers that sell or manufacture products that qualify as industrial machinery.

Academic research on the impact of these tax credits shows that these credits increase the amount of investment companies make. Some fraction of the industrial machinery purchased due to this credit will be produced in Tennessee. This increase in spending on goods in Tennessee will have spillover effects as the industries that produce these goods will need to purchase additional inputs to build the machinery, hire transportation to deliver the goods, and pay workers for the additional production. We make a conservative estimate that approximately $4 million in annual spending would not have occurred in the absence of the credit.[25]

The table below summarizes our estimates on the annual increase in spending on industrial machinery in Tennessee, the additional increase in goods require to meet this increase, the increased earnings for workers as a result of the industrial machinery credit, and the additional jobs created by the credit.

TABLE 13. Average Annual Economic Impact of the Industrial Machinery Credit (dollar amounts in millions)

Average Annual Increase in Spending on Eligible Machinery and Equipment	Average Annual Spending at Tennessee Companies	ECONOMIC IMPACT		
		Output	Earnings	Employment
$85.6	$3.6	$7.4	$2.0	55

Source: AEG analysis based on data from the Tennessee Department of Revenue and Bureau of Economic Analysis

Companies in Tennessee annually purchase $86 million more in industrial machinery because of the credit. We estimate that $3.6 million more is spent *at Tennessee companies* due to these purchases. This additional spending results in $7.4 million in increased annual spending statewide. The additional spending and production results in $1.7 million in increased annual earnings for Tennessee workers, and 55 additional jobs.

These figures represent a conservative estimate for the impact of the industrial machinery credit. We assumed that only 2% of certain types of industrial machinery were purchased in Tennessee, which represents the share of national industrial machinery production that occurs in Tennessee. On the one hand, this may be an underestimate, since companies are more likely to purchase machinery from nearby producers when given an option. On the other hand, this estimate does not account for the fact that a lot of industrial machinery is actually sourced *globally*. For a full description of the methodology used to estimate these figures and information on other assumptions, see "Economic Impact from Industrial Machinery Purchases" on page A-3.

Average Wages of Industrial Machinery Credit Recipients

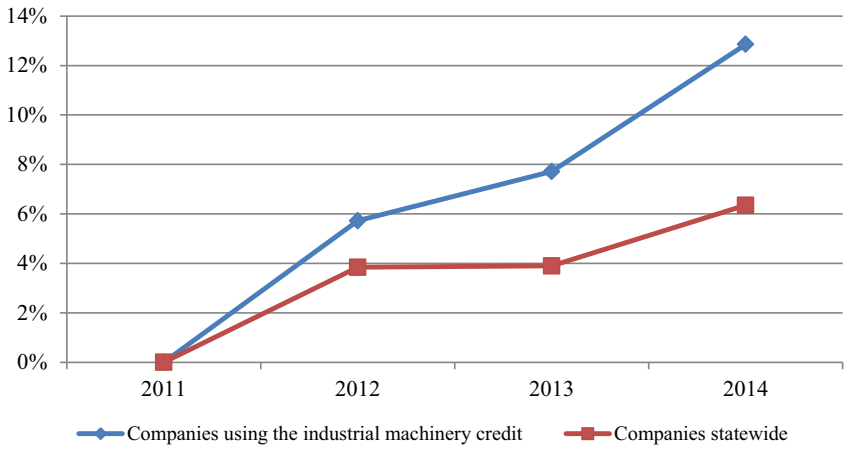
As we note earlier in this section, industrial machinery credits may increase employee earnings by providing incentives to increase investment in capital and increase worker productivity. On Figure 20 on page 45, we present the cumulative growth in average wages at companies that used the industrial machinery credit compared to companies statewide.[26] The growth in the

25. See "Economic Impact from Industrial Machinery Purchases" on page A-3 for more information on this estimate and our method for estimating economic impact.

average wage for companies that used the industrial machinery credit was about seven percentage points higher than the growth statewide.

The effect on wages that is exclusively attributable to the industrial machinery credit would likely vary from this estimate. Companies that use the industrial machinery credit may have characteristics that would contribute to wage growth that are independent of receiving the industrial machinery credit. Estimating the precise effect of the industrial machinery credit on wages would require controlling for the company's industry, size, location within Tennessee, and other characteristics.

FIGURE 20. Cumulative Growth in Average Wages Since 2011 at Companies Claiming the Industrial Machinery Credit Compared to Companies Statewide



Source: Tennessee Department of Revenue; U.S. Bureau of Labor Statistics, Occupation Employment Statistics
Analysis: Anderson Economic Group, LLC

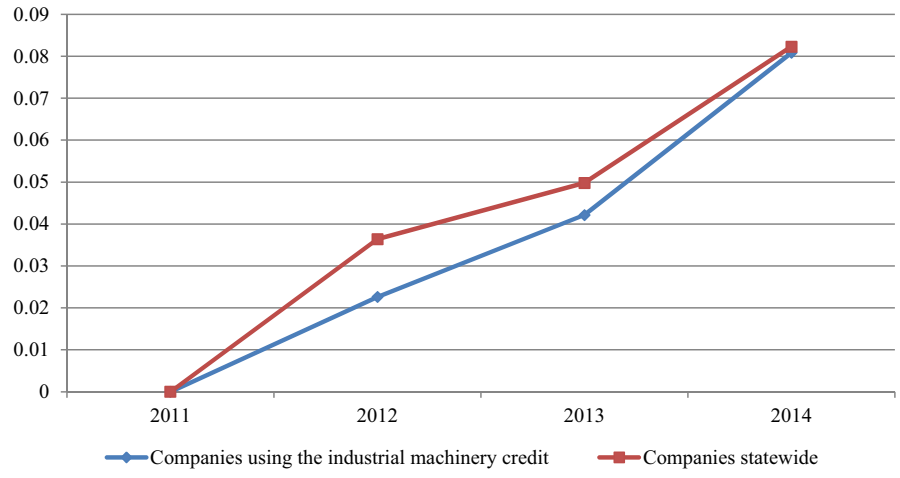
Because companies in the manufacturing sector represent the largest share of credit claims, we also analyzed the growth in wages for manufacturing companies who claimed the industrial machinery credit, against the manufacturing industry in Tennessee as a whole. Figure 21 on page 46 shows the difference in growth from 2011 in each set of companies. The growth in wages for manufacturing companies that claimed the credit was roughly equal to that of companies that did not receive the credit by the year 2014, and even lagged behind the

26. The figure does not represent every business that claimed the industrial machinery credit from 2011 through 2014, since some businesses either were not required to provide payroll information or did not file a tax return each year. The businesses included in the analysis shown in this figure represent about 33% of the businesses that claimed the industrial machinery credit, accounting for about three-quarters of the industrial machinery credit claimed during this time period.

growth in wages for companies that did not receive the credit in the intervening years.

While we cannot know for sure why this is this case, it may be that companies who are performing worse need to modernize their machinery in order to remain competitive in the market. Therefore they may not have the revenue to raise wages until they have upgraded their capital and experience some years of growth. In that case, these companies may have lagged wage growth by even more without the credit. This sort of selection problem makes it difficult to determine the impact of the credit on wages.

FIGURE 21. Cumulative Growth in Average Wages at Manufacturing Companies Claiming the Industrial Machinery Credit Compared to Companies Statewide (indexed to 2011 average wages)



Source: Tennessee Department of Revenue; U.S. Bureau of Labor Statistics, Occupation Employment Statistics; US Census Bureau, County Business Patterns
Analysis: Anderson Economic Group, LLC

In Figure 22 on page 47 we show the results of a statistical analysis estimating the difference in wage growth between companies who accepted the credit between 2011 and 2014 and the statewide average. This analysis differs from that shown in the previous two graphs because we control for industry across the whole sample of companies claiming the credit.

Companies that accepted the industrial machinery credit saw average wage growth roughly 5% above peer companies in their industry from 2011 to 2014, although the effect was not significant. While companies that received the credit experienced higher wage growth, on average, there was wide variation and many companies experienced lower wage growth than their peers. For more detailed information on the method for this analysis, see "Industrial Machinery Credit Wage Analysis" on page A-2.

FIGURE 22. Relative Growth in Wages Since 2011 at Companies Claiming the Industrial Machinery Credit Between 2011 and 2014

Source: AEG analysis based on data from the Tennessee Department of Revenue, U.S. Bureau

HEADQUARTERS SALES TAX CREDIT

Table 14 below shows data provided by the Tennessee Department of Revenue on sales tax credits claimed by relocating or expanding headquarters. From 2011 to 2014, the total amount of sales tax credits claimed averaged $6.2 million a year. The amount claimed has been growing quickly, more than doubling since 2012. Only twelve unique taxpayers claimed this credit during this time period, the fewest of all of the credits we analyzed.

TABLE 14. Headquarters Sales Tax Credit, 2011 to 2014 (dollar amounts in millions)

	2011	2012	2013	2014
Number of Taxpayers Claiming Credit	5	5	5	5
Amount of Credits Claimed	$2.7	$3.8	$7.8	$10.5
Implied Spending Base	$38.8	$54.0	$110.5	$150.6
Credit Claimed per Taxpayer	$0.5	$0.8	$1.5	$2.1
Implied Spending per Taxpayer	$7.8	$10.8	$22.1	$30.1

Source: Tennessee Department of Revenue
Analysis: Anderson Economic Group

Much of the economic research on the location of corporate headquarters falls into two main categories, the impact of headquarter locations decisions on the value to the firm, and the role of headquarters within the firm and how location

impacts the performance of certain headquarters functions. Some studies in these areas do touch on the role of tax credits in headquarters location decisions, but they are generally not relevant to the question of the impact of sales tax credits.

Most headquarter location decisions are made as part of a broader business plan. These business plans take many factors into account, including proximity to operations and clients, local talent, infrastructure, and tax considerations. In addition, each of these headquarters also received significant other incentives as part of their relocation or expansion. The sales tax credit itself was only a marginal piece.

High regulatory burdens imposed by the credit dissuade some companies from even applying for the sales tax credit, further reducing any potential benefits. However, it is important to note that this credit is applied to a different tax base than any other incentive provided. By providing a credit on sales tax rather than franchise and excise tax, companies are guaranteed to be able to claim the credit.

Since the magnitude of this credit suggests it was unlikely to be the tipping point in determining a headquarters location, any economic benefit from the sales tax credit would stem from an increase in spending on those qualified items which would not have occurred in absence of the credit. The qualifying purchases must be used in the construction or operation of the facility and include:

- Machinery
- Equipment, including furnishings
- Computer software

The economic benefits could take two forms. First, businesses looking to remodel, or expand, may construct somewhat larger facilities than they would have if required to pay the sales tax. Second, these businesses may purchase additional equipment, furnishings, or computer software made relatively less expensive due to the tax credit.

Given the small size of the credit relative to the cost of relocation and headquarters construction, the cost burden of compliance for companies and for the State, and the paucity of evidence to suggest otherwise, we conclude that the economic impact of this credit is negligible.

COMMUNITY INVESTMENT TAX CREDIT

Affordable housing development incentives are an important tool that federal and state policy makers use to improve housing stability, public health conditions, and financial relief among low-income households. Incentives are often used to increase access to funding for affordable housing projects, subsidize

below-market-rate units, and encourage preservation and renovation of existing affordable housing stocks.

The community investment tax credit (CITC) is an incentive for financial institutions to provide low-interest loans to non-profit organizations and government agencies to build and renovate low income housing. In this section, we first look at the use of the tax credit in the state. We also provide an overview of affordable housing in Tennessee. Lastly, we analyze the economic and social impact of affordable housing using the available data, informed by academic literature and case studies.

The Use of CITC in Tennessee

In Table 15 below, we list the amount of below-market loans that were eligible for CITC during the period from 2011 to 2014, broken down into three areas of spending: owner-occupied properties, rental properties, and homeless prevention activities.

TABLE 15. Amount of Loans Eligible for CITC 2011-2014 (millions)

	2011	2012	2013	2014
Total Amount of Loans	$29.7	$30.2	$40.6	$50.3
Loans to Support **Owner-Occupied**	$5.6	$4.9	$3.6	$10.5
Loans to Support **Rental**	$21.2	$25.3	$35.0	$36.8
Loans to **Other Housing Related Services**	$3.0	-	-	$3.0

Source: Tennessee Housing Development Agency - Program Summary 2012-2014

This funding allows developers to create and preserve affordable housing units. In Table 16 on page 50, we summarize the numbers of affordable owner housing and affordable rental housing created and maintained as a direct result of these CITC eligible loans.

TABLE 16. Number of Units Built or Preserved Using CITC Eligible Loans

	2011	2012	2013	2014	Average
Total Units	946	1,369	1,581	1,518	1,354
# of **Affordable Owner-Occupied** Units Built or Renovated	317	155	748	218	360
# of **Affordable Rental** Units Built or Renovated	629	1,214	833	1,100	944
# of Units (**Other**)	-	-	-	200	50

Source: Tennessee Housing Development Agency - Program Summary 2012-2014

Housing Affordability in Tennessee

As defined by the Department of Housing and Urban Development (HUD), households that pay more than 30% of their income on housing are considered to be cost burdened.[27] While the housing ownership rate in Tennessee has stayed relatively constant since 2000, the share of cost-burdened households has increased significantly. Fewer homes are affordable to a family earning the median income. In 2012, 38% of households in Tennessee spent more than 30% of their income on housing in the form of rent or mortgage payments, almost doubling from 2000.[28] More renters, at 46%, are cost-burdened than homeowners, but homeowners are still cost burdened at an estimated rate of 32%.[29]

Existing Affordable Housing in Tennessee

The current housing stock across Tennessee is aging, with the majority of low-income housing built more than 15 years ago. Among deeply subsidized properties, such as public housing projects funded by the Department of Housing and Urban Development, nearly 60% were constructed prior to 1980 and are over 30 years old.[30] Many of these units and properties require consistent inflows of funding to pay for regular maintenance and major repairs.

27. U.S. Department of Housing and Urban Development—Affordable Housing, http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/ accessed on August 24, 2016.

28. Hulya Arik, "Tennessee Housing Market at a Glance 2014." Tennessee Housing Development Agency, 2014.
In 2010, 15% of owners and one-third of renters were cost-burdened.

29. Hulya Arik, 2014.

However, federal housing subsidies have declined substantially in the recent years. Federal funding for public housing operations and replacement has dropped 25%, after adjusting for inflation, since 2001.[31]

Privately-owned subsidized units are also at risk. In 2014, there were 395 properties with a total of 34,828 units that received funding from Section 8 Project Based Rental Assistance and offered affordable rental housing to low-income households in Tennessee.[32] Property owners may choose to opt out the HUD's Section 8 program when the contracts expire, allowing them to charge market-rate rents. These contracts are typically renewed every five years. Tennessee Housing Development Agency estimates that "33 percent (10,953 units) of total PBRA units are at risk (of conversion to market-rate rental) by the end of the fifth year."[33]

Literature Review on the Economic and Social Impact of Affordable Housing

Governments provide housing incentives for a variety of reasons, including public health, homelessness, and economic growth. In this section, we summarize what we currently know from research about the effects of affordable housing.

Affordable Housing Projects and Families. In theory, providing affordable housing units to families reduces the fraction of income they must spend on rent or mortgage, and thus allows them to consume more of other goods.

Affordable housing can improve housing conditions and stability for low-income families, but research shows that housing quality plays a more dominant role than housing affordability in predicting emotional and behavioral problems among low-income children.[34] The stress from living in homes with leaking roofs and broken windows and being forced to move multiple times during childhood contributes to poor performance at school. This result emphasizes the importance of ensuring the upkeep of older affordable homes for children's wellbeing. Ensuring that funding for affordable housing preservation is suffi-

30. Laura Swanson, "Aging Affordable Rental Housing in Tennessee & the Need for Preservation," Tennessee Housing Development Agency, 2015.

31. Will Fischer, "Expanding Rental Assistance Demonstration Would Help Low Income Families, Seniors and People with Disabilities," Center on Budget and Policy Priorities, November 7, 2014.

32. Tennessee Housing Development Agency, "2014 Program Summary," 2014.

33. Laura Swanson 2015.

34. Rebekah L. Coley, Tama Leventhal, Alicia Doyle Lynch & Melissa Kull, "Relations between Housing Characteristics and the Well-Being of Low-Income Children and Adolescents", *Developmental Psychology,* 2013, 49(9): 1775-1789.

cient can have lifelong positive impacts on low-income children and their families.

One other area of research looks into how this increase in disposable income affects families with children. Accessing more disposable income does not necessarily imply more spending on child development. Research suggests an inverted U-shaped relationship between expenditures on child enrichment and housing cost burden.[35] Families who spend 30% of their income on rent spend the most on child enrichment; the spending dropping at both higher and lower levels of affordability. This finding supports the threshold that defines cost-burdened households at 30%. The result also suggests that providing affordable housing to cost-burdened families, especially those severely cost-burdened, can have a significant effect on their consumption.[36]

Affordable Housing and Value of Neighboring Properties. Property values are generally regarded as an indicator of neighborhood quality. A sharp drop in value often leads to an increase in housing turnover and foreclosure, affecting social and economic stability in local communities. Many communities have expressed opposition to subsidized housing out of fear of reduction in property values.

Yet, empirical researchers have not reached a consensus on the effect of affordable housing on neighboring property prices. Some researchers find a drop in housing prices if "white residents flee or potential purchasers begin to view the neighborhood as undesirable based on tenant characteristics."[37] Others find that the transformation of disamenities into newly-designed residential buildings often generates positive externalities on nearby housing prices.[38]

While economic research has found some evidence suggesting a positive impact of affordable housing on nearby home values, we are cautious in generalizing the effect to the state of Tennessee. Overall, the impacts are highly sensitive to the income level of hosting neighborhoods, conditions of the local housing market, and tenant mix of the new projects.

35. Sandra J. Newman & C. Scott Holupka, "Housing Affordability and Investments in Children", *Journal of Housing Economics*, 24(2014), 89-100.

36. Severely cost-burdened households are defined as those spending 50% or more of their household income on housing

37. Ayoung Woo, Kenneth Joh & Shannon Van Zandt. "Unpacking the Impacts of the Low-Income Housing Tax Credit Program on Nearby Property Values," *Urban Studies,* 2016, Vol. 53(12) 2488-2510.

38. Schwartz, et al. "The External effects of Place-based Subsidized Housing," *Regional Science and Urban Economics,* 2006, 36(6): 679-707.

The Crowd-Out Effect of Affordable Housing Projects. Crowding out arises when government-funded developments compete with and therefore discourage private enterprises from engaging in business activities in the same area of the market. For this reason, affordable housing programs such as the community investment tax credit could displace private construction, dramatically reducing potential economic benefits.

Previous research has found substantial crowd-out effects on private rental housing construction by government-funded projects. A recent study examining the effect of Low Income Housing Tax Credit (LIHTC) developments finds displacement in unsubsidized construction that ranges from 70% to 100%.[39] Another study looking at various programs that pre-date the LIHTC program finds the crowd-out effect to be smaller, ranging from 30% to 70%.[40] Additionally, the effect is less prominent for housing projects that target very low-income families, because few similar projects have been developed by private market developers without government subsidies.[41] Therefore, the crowd-out effect varies by the targeted income group of the housing program. Almost all of these crowd-out effects apply exclusively to rental units. Researchers find no crowd-out effect from the construction of owner-occupied affordable units.[42]

The Economic Impact of Affordable Housing Construction

There are many potential areas where subsidies for affordable housing could have an economic impact. These include more disposable income for families receiving affordable housing, improved long-term health and behavioral outcomes for children, changes in home values for nearby properties, and increased construction activity.

Of all of these categories of economic impact, the one which we are able to quantify given available research and data is the impact of increased construction activity. As shown in Table 15 on page 49, there were about $50 million in loans for affordable housing provided under this tax credit in 2014. Of these, $10.5 million in loans were for owner-occupied housing and $36.8 million in loans were for rental housing.

39. Michael D. Eriksen & Stuart S. Rosenthal, "Crowd Out Effects of Placed-Based Subsidized Rental Housing, New Evidence from the LIHTC Program," *Journal of Public Economics,* 2010.

40. Todd Sinai & Joel Waldfogel, "Do Low-Income Housing Subsidies Increase the Occupied Housing Stock?" *Journal of Public Economics,* 89, 2137-2164.

41. Michael P. Murray, "Subsidized and Unsubsidized Housing Stocks 1935 to 1987: Crowding Out and Cointegration", *Journal of Real Estate Fiance and Economics*, 1999, 18, 107-124.

42. Murray, 1999.

As we described in the previous section, research suggests that the majority of publicly subsidized rental housing construction actually crowds out construction activity that would have otherwise occurred. The scale of this crowd-out effect varies among researchers, with 70% representing the middle of this range. There is no such effect for owner-occupied housing, so we assume there will be no crowd-out on housing construction due to loans for owner-occupied housing.

Applying our estimates for crowd-out and multipliers for housing construction in Tennessee, we find that the economic impact of housing construction annually is $34 million, including 236 jobs and $11 million in earnings. These results are summarized in Table 17 below. The direct impact is the amount of construction spending directly attributable to the loans. The indirect impact is the activity in Tennessee caused by that spending.

TABLE 17. Average Annual Economic Impact of Affordable Housing Construction due to the CITC in Tennessee (dollar amounts in millions)

	Direct	Indirect	Total
Employment	0	236	236
Earnings	0	$10.6	$10.6
Output	$15.0	$18.9	$33.9

Source: AEG analysis based on data from the Tennessee Department of Revenue and Bureau of Economic Analysis

Note that the size of loans and amount of construction increased significantly in 2014, the last year of our analysis. If that is a trend instead of a temporary spike, then we would expect the economic impact to be considerably greater than these estimates moving forward.

SMALL BUSINESS JOBS AND RURAL OPPORTUNITY FUNDS TAX CREDITS

The State of Tennessee offers a 10-year annual tax credit equivalent to 10% of the total amount of loans to the Tennessee Small Business Jobs Opportunity Fund and the Rural Opportunity Fund. In addition to the tax credits, participating financial institutions are eligible to receive interest payments at 2.5% to 3% annual interest for a 10-year period, depending on the size of the loan.

The Small Business Jobs Opportunity Fund

The Small Business Jobs Opportunity Fund (SBJOF) was launched in 2010 by a partnership between the State of Tennessee, the Tennessee Bankers Association and Pathway Lending, a not-for-profit community development financial institution. SBJOF provides access to capital for small businesses in all Tennessee counties. The SBJOF focuses on lending to very small businesses. Among all 92 companies receiving loans from SBJOF, only 10 companies had more than 30 employees.[43] The average number of employees was 16.[44]

As of August 2016, the fund had 125 loans outstanding totaling $51 million in principal. Many companies receiving loans from the fund have shown strong capacity to service the debt but a lack of collateral. Typical rates charged to borrowers are 1% to 3% above the prime rate, which is a favorable rate for a borrower that cannot access a traditional bank loan.

The Rural Opportunity Fund

Launched in 2007, the Rural Opportunity Fund (ROF) offers loans to small businesses that are located in low- and moderate-income areas. Though many of the loans go to businesses located in rural areas, the fund does not have an agricultural focus. Approximately half of the loans from this fund go to manufacturers, with over 20% going to health care and social services enterprises. As of August 2016, the fund had 111 loans outstanding to 72 companies, totaling $20 million in principal. Like the SBJOF, the goal of the fund is to provide credit to companies that are unable to access traditional bank loans. Typical rates charged to borrowers are 1% to 3% above the prime rate, which is a favorable rate for a borrower that cannot access a traditional bank loan.

Both the SBJOF and the ROF make a concerted effort to provide credit to minority- and women-owned businesses, in particular. As of last year, 37% of loans were provided to women-owned businesses and 17% of loans were provided to minority-owned businesses.

Literature Review on Small and Rural Businesses and the Economy

In this section, we discuss our extensive literature review on the importance of credit availability for small and rural businesses, and how thriving small businesses might aid the economy.

Impact of Small Businesses. Assisting small business has been viewed as a means to enhance job creation and economic growth. The federal government has provided favorable government regulations, tax incentives, and support programs for small businesses. Examining the contribution of small and large firms to U.S. job growth, researchers find that small businesses with less than 100 employees are the largest source of net job growth.[45] This finding has also been confirmed by later studies which show that small businesses create more jobs than larger ones.[46] Furthermore, supporting small businesses appear to reduce

43. Clint Gwin, "Pathway Lending TN-ROF and TN-SBJOF Request Response." Letter to Anderson Economic Group, August 23, 2016.

44. Ibid.

45. Bruce A. Kirchhoff, and Bruce D. Phillips, "The Effect of Firm Formation and Growth on Job Creation in the United States," *Journal of Business Venturing*, 1998, 3:4, 261-272.

job loss during economic recessions, as smaller firms are less sensitive to aggregate fluctuation and tend to cut fewer jobs than larger firms when the unemployment rate is high.[47]

The Effect of Credit Availability on Small Businesses. Both the SBJOF and ROF extend credit to small businesses in need. Bank's lending activities have a profound impact on firm performance. The impact is more prominent on the smaller businesses since they do not have access to capital from the bond market like larger firms do.[48]

The local economy benefits from the positive spillover effects of new business activities. Availability of credit encourages business start-ups as it allows the owners to cover their initial expenses.[49] Research also shows it has a positive effect on small business survivability.[50] Growing businesses often require capital to fund equipment and technology upgrades, or to pay for more labors to expand operations. Conversely, firms that are credit constrained may become more financially distressed as they may be forced to use more expensive capital to finance their operations. Evidenced by the same research, borrowing on credit cards or trade credits is associated with an increased probability of firm failure.[51]

Women and Minority Business Owners in the Credit Market. Research concerning the role of discrimination in credit markets shows that small business owners from some demographic groups face greater difficulties in accessing capital from financial institutions than others.[52] Minority business owners are denied credit far more frequently than their white counterparts even after accounting for differences in credit scores.[53] There is also evidence showing

46. David Neumark, Brandon Wall & Junfu Zhang, "Do Small Businesses Create More Jobs? New Evidence for the United States from the National Establishment Time Series," *The Review of Economics and Statistics*, 2011, 93(1):16-29.

47. Guiseppe Moscarini & Fabien Postel-Vinay, "The Contribution of Large and Small Employers to Job Creation in Times of High and Low Unemployment." *American Economic Review*, 2012, 102(6): 2509-2539.

48. Gabriel Chodorow-Reich, "The Employment Effects of Credit Market Disruptions: Firm-Level Evidence from the 2008-9 Financial Crisis," *The Quarterly Journal of Economics*, vol. 129, 2014.

49. Nada Kobeissi, "Impact of the Community Reinvestment Act on New Business Start-Ups and Economic Growth in Local Markets," *Journal of Small Business Management,* 2009 47(4), pp.489-513.

50. Traci L. Mach & John D. Wolken, "Examining the Impact of Credit Access on Small Firm Survivability," Federal Reserve Board, 2011.

51. Ibid.

52. Cavalluzzo, Ken & Linda Cavalluzzo, "Market Structure and Discrimination: The Case of Small Businesses," *Journal of Money, Credit, and Banking,* Nov 1998, 771-792

that female business owners face more constraints beyond those faced by male owners. Researchers found that "banks do hold a stereotypical misperception that women owners are less capable of paying back a loan than their male counterparts."[54] As a result, loan denial rates for women-owned businesses are significantly higher than businesses owned by men.[55]

This connection between the likelihood of loan approval and the race and gender of the applicant hurts the growth potential of many small businesses. Women and minority business owners are more likely to be discouraged from applying for a bank loan for fear of rejection.

In addition to a high loan denial rate, minority-owned firms face higher interest rates. Black-owned firms, including the ones with a good credit history, are charged one percent higher on loan interest than white-owned firms with a similar credit rating, on average.[56] Greater obligations on interest payments add to the operating cost of a small business, increasing the likelihood of business contraction or closure.

Estimating Economic Impact

A loan to the SBJOF or the ROF is a safe investment. Lenders earn interest at a rate of 2.5% to 3%, and they receive their principal back in the form of 10 years of tax credits, each worth 10% of the loan. We can conclude that banks would not provide the same financing for small businesses that they provide to the SBJOF and ROF, and therefore that these funds provide $71 million in financing for small businesses in Tennessee that would not otherwise occur.

Despite the benefits for small businesses and the surrounding community, we are unable to quantify the economic impact of these particular loans on the state. Without more detailed knowledge about the firms that received loans and the nature of their operations and finances, we cannot make any specific claims about whether and how the funds have resulted in a net increase in economic activity in the state.

53. David G. Blanchflower, Phillip Levine & David J. Zimmerman, "Discrimination in the Small-Business Credit Market," *The Review of Economics and Statistics,* MIT Press, 2003, vol.85(4), pages 830-943.

54. Naranchimeg Mijid, "Why are Female Small Business Owners in the United States Less Likely to Apply for Bank Loans than Their Male Counterparts?" *Journal of Small Business & Entrepreneurship,* 2015, Vol. 27, No.2, 229-249.

55. Ibid.

56. Blanchflower, et al. 2003

Appendix A. Methodology

To estimate the economic impact of business tax credits in Tennessee, we adopted an unique methodology that took advantage of the data provided and the unique nature of Tennessee's tax credits. This methodology varied by credit. See the detailed methodology and assumptions from our analysis below.

JOBS TAX CREDIT AND INDUSTRIAL MACHINERY CREDIT EMPLOYMENT ANALYSIS

To complete our employment analysis for the standards jobs tax credit and industrial machinery credit, we started with two sets of data for each credit. Each of these data sets include two different types of companies: (1) companies that received the credit, and (2) companies that did not receive the credit but were in the same industries as companies in the first group. We refer to this second group as "peer companies."

The first set of data included companies that were awarded the credit in 2011, as well as companies that were in the same industries and were operating in 2011, but did not receive the credit. The second set of data included companies that were awarded the credit in 2012, as well as companies that were in the same industries and operating in 2012, but did not receive the credit.

Employment growth by industry. To account for industry specific growth effects, we analyzed employment growth within an industry for companies who received the credit compared to employment in the same industry for companies who did not receive the credit. To do this, first we indexed each year's employee headcount in each industry to the employee headcount in that industry in the year before the credit was received. For companies in the 2011 data set, the index year is 2010. For companies in the 2012 data set, it's 2011.

We then ran a regression in Stata on the effect of the credit on the indexed employment for each of the years following the base year, with industry fixed effects. We weighted our observations so that larger industries would have a larger impact on our estimates. We developed the weight for each industry by adding together employee headcount in an industry in the base year for companies who did receive the credit and companies who did not receive the credit. We then divided the industry total headcount by the total headcount for all industries in the base year. Because we tested multiple hypotheses, we applied a Bonferroni correction, described below, to determine the standard error level at which we should consider our results to be statistically significant.

Bonferroni correction. A Bonferroni correction adjusts the variance required to declare a result significant when testing multiple hypotheses. To test a result, a researcher estimates the impact of one variable on another. Then, the researcher determines the likelihood that he or she would have obtained that result if the true impact were zero. This likelihood is termed a p-value. If the p-value is low, the researcher can reject the hypothesis that the impact is zero with

strong confidence. A common threshold for a p-value is 5%. If there is less than a 5% chance there is no impact (the impact is zero) given our standard error, we accept the hypothesis that our impact variable has an effect. However this implies that 5% of the time, we will accept our estimate, even when the true estimate is zero. If we test multiple times, eventually we would expect to make this error.

In our analysis we ran 18 significance tests. Using a p-value of 5%, we would expect a high likelihood of incorrectly rejecting the hypothesis that the tax credit has no impact on indexed employment in a given year. To account for the use of multiple tests, the Bonferroni correction divides the threshold p-value by the number of tests being run—in this case, 5% divided by 18. This gives us an adjusted p-value of 0.3% required for significance, where we are confident enough to reject the hypothesis that the tax credit does not have an impact on indexed employment. This reduces the probability of making these types of errors to approximately 5%, as it would be if we ran a single regression and used a standard p-value of 5%.

INDUSTRIAL MACHINERY CREDIT WAGE ANALYSIS

To measure the impact of the industrial machinery credit on wages, we collected data from the Tennessee Department of Revenue for companies who received the credit between 2011 and 2014. Note that these companies made an investment and were awarded the IMC at some point in the previous ten years. We then indexed the average wage, using the sum total of payroll in each industry divided by the sum total headcount within the industry, to the 2011 average wage. We then used a fixed effects regression, using industry specific effects, to determine the impact the industrial machinery credit had on wage growth in successive years.

We again weighted our observations, this time by the share of employment within an industry among companies that claimed the credit. Because we ran multiple hypotheses, we again used a Bonferroni correction to determine significance. Using a standard 5% p-value to indicate significance, we would require an adjusted p-value of 1.67% to declare a result significant.

We were unable to obtain payroll data for companies who did not receive the credit. To establish a control group, we used statewide industry data from the BEA. This data does include information from companies who claimed the credit, but they make up a very small portion of the statewide data and should not produce much of an effect our results. We also were unable to analyze every industry due to differences between BEA data and data from the Tennessee Department of Revenue. We limited our analysis to industries for which we could produce a reliable comparison.

ELASTICITY ANALYSIS FOR JOBS TAX CREDIT

To estimate the increase in employment and payroll caused by the jobs tax credit, we first estimated the average savings in labor costs each jobs tax credit provides, as a percentage of the total for the average new hire. We then calculated the total hiring and payroll change at firms by year, using data from the Department of Revenue. We then applied an estimated *elasticity*, which measures the percent change in employment for each percent change in compensation. We applied this same percentage change to both the employment and the change in payroll estimate.

According to the Bureau of Labor Statistics, the average annual wage in Tennessee was $41,300 in 2015. Also according to the Bureau of Labor Statistics, the average employee tenure in the private sector was 4.2 years in 2014. Assuming that these averages apply to the employees hired at firms that claim the jobs tax credit in Tennessee, the average wages paid per employee over the employee's tenure are $173,460. Notably, wages only account for a portion of the cost of compensation. According to the Bureau of Labor Statistics, wages have accounted for 71% of worker compensation in the private sector since 2010. The resulting estimated cost per employee, including benefits, is $244,310, over their tenure at a company.

For each tax credit, we need to account for the fact that companies cannot collect the full credit. To account for this, we assume that the amount that companies expect to collect per job is the average amount actually claimed per job in each year. In the case of the Tier 2 & 3 credit and the super jobs credit, the credit can be claimed over multiple years. We multiply this amount by three and four, respectively, to take this into account for the Tier 2 & 3 credit and the super jobs credit.

Finally, we rely on a meta-analysis of hundreds of studies on the elasticity of labor demand relative to its cost to determine the elasticity. We find that, for every 1% reduction in labor cost, there will be a corresponding 0.5% increase in employment. We make the additional assumption that the corresponding increase in payroll will also be 0.5%.

To determine the indirect effect of this increased payroll, we apply Bureau of Economic Analysis RIMS II final-demand multipliers that correspond to the "Households" industry for the state of Tennessee.

ECONOMIC IMPACT FROM INDUSTRIAL MACHINERY PURCHASES

To estimate the impact of the industrial machinery credit, we used industry-level data from the Tennessee Department of Revenue. The data provided to us gave us all of the information listed in form Schedule T, filed by companies who claimed the credit. This information was aggregated to the NAICS industry code due to data suppression rules. In cases where we had detailed industry codes, we further aggregated the data to the NAICS two digit sector code for analysis.

We began by aggregating the purchase price of machinery by NAICS sector for each year. We then determined the annual average spending on qualified machinery in each industry from 2011 to 2014. Once we determined the annual amount of spending, we then estimated the share of spending that occurred due only to the industrial machinery credit. Using academic research on the effect of investment credits, we estimate that a 1% decrease in the purchase price of machinery leads to a 2% increase in the total spending on investments. For further information on the sources used to determine this elasticity, please see "Literature Review" on page C-3.

Once we had estimated the portion of investment attributable to the credit, we estimated how that spending would impact the state's economy. Not all of the purchases will be made at Tennessee companies. The share of spending that occurs in Tennessee will depend on the purchase type and industry. Because we do not have firm-specific data on the purchases of qualified machinery, we assumed a purchase industry based on the industry of the purchaser. For example, we assumed that for companies in the mining industry, they would be most likely to purchase equipment from a company in the machinery manufacturing industry, while companies in the health care and social assistance industry, would be most likely to purchase equipment from a company in the computer and electronic product manufacturing industry.

We further assumed that all purchases not in the computer and electronic product manufacturing industry were purchased directly from the manufacturer, while computer and electronics purchases would be a mix of retail and wholesale purchases. Once we determined the purchase industry, we determined the share of the purchase price that should be apportioned to the seller. For direct purchases this share is 100% of the purchase price.

We then used Bureau of Economic Analysis (BEA) data to determine the retail and wholesale share of the purchase price. This data apportions the value of goods sold by an industry to the producer, the transporter, the wholesaler, the retailer, and the purchaser. By dividing the retail value from the purchase value, we apportioned 9% of the purchase price to retailers, and 14% to wholesalers.

Most manufacturing equipment is made in highly specialized production facilities, likely to be located in another state. But retail purchases of computer equipment are very likely to be purchased from a local facility. We assumed that the following share of purchased equipment would occur in Tennessee: 2% purchases direct from the manufacturer, 25% from wholesalers, and 95% from retailers. This 2% estimate corresponds to the share of all national industrial machinery manufacturing production that occurs in the state of Tennessee. Multiplying all of these factors by spending in each industry gives us the resultant spending in Tennessee.

We then multiplied this total resultant spending amount by the corresponding final demand multiplier to estimate the total effect of the additional spending, accounting for secondary effects. The final demand multiplier is calculated by the BEA and represents the increase in economic activity resulting from an additional dollar spent in the purchase industry. Once we multiply our share of resultant spending in Tennessee by the correct economic multiplier, we then sum up each of the industry effects to produce a total effect for the entire state of Tennessee.

See Table A-1 on page A-6 for a summary of total expenditures, expenditures in Tennessee, and the multipliers we used to determine the economic impact of industrial machinery purchases in Tennessee.

Table A-1. Annual Economic Impact of the Industrial Machinery Credit in Tennessee, 2011-2014

Payment Type/Industry Category	Average Annual Expenditures	Average Annual Expenditures in TN	Final Demand Multipliers			Economic Impact		
			Output	Earnings	Employment	Output	Earnings	Employment
Machinery Manufacturing	$ 65,910,584	$ 1,318,212	2.187	0.487	10.546	$ 2,883,193	$ 641,310	14
Motor Vehicle Manufacturing	$ 23,606	$ 472	2.372	0.500	10.573	$ 1,120	$ 236	0
Warehousing and Storage	$ 880,999	$ 17,620	2.081	0.630	17.834	$ 36,672	$ 11,108	0
Other Retail (Computer and electronic products)	$ 1,687,351	$ 1,590,468	2.031	0.628	20.727	$ 3,230,399	$ 998,177	33
Wholesale Trade	$ 2,624,768	$ 650,197	1.944	0.582	12.009	$ 1,264,243	$ 378,610	8
Totals	$ 71,127,308	$ 3,576,968	2.073	0.567	15.375	$ 7,415,627	2,029,441	55
Average Annual Economic Impact of the Industrial Machinery Credit in Tennessee, 2011-2014						**$ 7,415,627**	**$ 2,029,441**	**55**

Source: AEG Estimates using Tennessee Dept. of Revenue data, BEA RIMS II Type II Multipliers

Analysis: Anderson Economic Group, LLC

Notes: Employment multipliers express the number of jobs per $1 million increase in expenditures in an industry.

Expenditures include payments to vendors and suppliers with a payment address in Tennessee.

Appendix B. Business Tax Credits in Peer States

In this section, we show the results of our research on business tax credits available in Tennessee's peer states. We first compare the requirements and size of the jobs tax credit and investment tax credits in Tennessee to a set of general peers. We then list a set of tax credits available in other states that are not available in Tennessee. Finally, we look into tax credits available for headquarters in a separate set of peer states that are particularly competitive for headquarters locations.

The lists of peer states were determined using information from the ECD about who the most common competitors are for businesses considering relocation or expansion in Tennessee. For a map of all peer states, see Figure B-1 on page B-4.

GENERAL PEER STATES

We compared business tax credits in Tennessee to those in a set of peer states. These peer states are a combination of competitors and neighboring states, determined in collaboration with the ECD. They include:

- Alabama
- Georgia
- Kentucky
- Mississippi
- North Carolina
- South Carolina
- Texas

Jobs Tax Credits

In Table B-1 on page B-5, we summarize the jobs tax credit in peer states, and provide the main requirement, credit value, and credit length. We exclude Texas from the list, because it currently doesn't offer any job tax credits of this nature. Three out of seven states listed base their credit rates on the gross payrolls from the previous year(s). All jobs tax credits have some carryforward periods, ranging from 5 to 10 years. Tennessee is the most generous in the amount it awards per job created; however, it is one of only two states that does not reward companies for retaining jobs over an extended period. No states among this set of peers provide refundable credits for this type of credit.

Investment Tax Credits

In Table B-2 on page B-6, we summarize information about the credits similar to Tennessee's industrial machinery credit in peer states. Texas is again

excluded from the table because it offers no tax credits for this general type of investment. All peer states except Alabama and Kentucky require their businesses to be in certain industries in order to qualify for the programs. Furthermore, all states list manufacturing as one of the qualified industries. The value of the credit available in all states falls in a range of 1% to 10%, which is the range provided in Tennessee.

OTHER TAX CREDITS IN PEER STATES

We found the following other types of tax credits in Tennessee's peer states. Three out of the seven peer states offer tax credits for investments in research & development. Only one peer state offers a sales tax credit for regional and national headquarters in the state.

1. Alabama
   - Full Employment Act of 2011—Businesses with 50 or fewer employees may receive a one-time income tax credit of $1,000 per new job paying over $10 per hour.
   - Income Tax Education Credit—Businesses may receive an income tax credit equal to 20% of an employer-sponsored educational program that enhances basic skills of employees up to and including the 12th grade functional level (including ESL programs).
2. Georgia
   - Quality Jobs Tax Credit—Companies receive a $2,500 to $5,000 tax credit for each new job created that pays at least 10% above the county average wage.
   - Research and Development Tax Credit—The program offers a tax credit for a business that increases its research spending.
   - Retraining Tax Credit—Businesses may receive a credit equal to 50% of its direct employee training expenses, up to a $500 credit per full-time employee, per training program.
3. Kentucky
   - Unemployment Tax Credit—$100 tax credit for each new hire who has been unemployed for at least 60 days.
   - Incentives for Energy Independence Act—An income tax credit is provided for companies that make a minimum investment of $25 million in an alternative fuel facility.
   - Kentucky Small Business Tax Credit—Businesses with 50 employees or fewer may receive a tax credit between $3,500 and $25,000 for providing a new full-time job and purchasing at least $5,000 of qualifying equipment or technology.
4. North Carolina
   - Credit for Investing in Large or Major Recycling Facility—A business that purchases or leases machinery and equipment for a recycling facility is eligible for a tax credit equal to between 20% and 50% of the purchase price.
5. South Carolina

- Research & Development Tax Credit—The program offers a credit equal to 5% of the business's qualified research expenses against 50% of its remaining tax liability after all other credits have been applied.

PEER STATES FOR COMPANY HEADQUARTERS

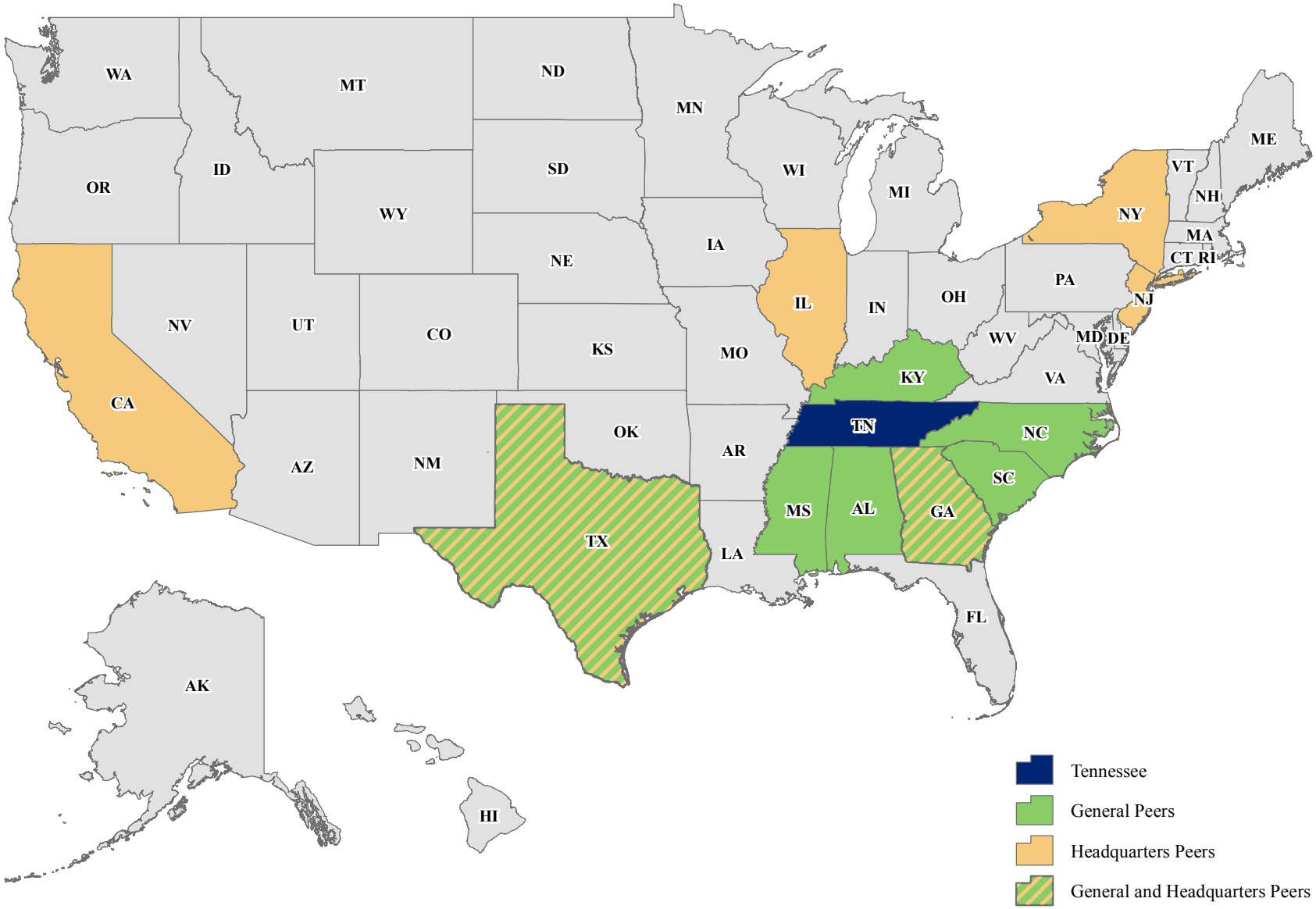
We compared tax credits available for headquarters in Tennessee to those in a separate set of peer states, since Tennessee competes for a different set of states for headquarters, in particular. These peer states were determined in collaboration with the ECD. They include:

- California
- Georgia
- Illinois
- New Jersey
- New York
- Texas

None of the peer states provides any tax incentives specifically targeting headquarters alone, but all of the peer states offer some jobs and investment tax credits that are available to business headquarters along with other entities. For example, the Illinois EDGE program ("Economic Development for a Growing Economy") provides tax credits to encourage companies, including headquarters, to locate or expand in Illinois when there is a competing location in another state.

In Table B-3 on page B-7, we have identified six states, including Tennessee, which offer tax incentives that are directly targeted at corporate headquarters. Two of the states in the list are also Tennessee's general peer states. All of the states in the list require a minimum amount of job creation to qualify. Four out of six states base their credit calculations on the actual cost or investment for headquarter relocation or expansion; two states base the credit amount on the number of jobs created and the total annual wage. Tennessee is the only state that doesn't allow regional headquarters to qualify for the incentives. All headquarter credits have some carryforward period, ranging from 5 to 15 years.

FIGURE B-1. Tennessee's Peer States



Source: Tennessee Department of Economic and Community Development

Table B-1. Jobs Tax Credits in Tennessee and Peer States

State	Who Qualifies	Min. Requirnment	Credit per Job	Tax Base and Limit	Credit Length	Carryforward Period
Tennessee	Businesses in manufacturing, warehousing and distribution, headquarters and call centers	25 new full-time positions and a minimum investment of $500,000	$4,500	50% of franchise and excise tax	1 year (additional 3 years and 5 years for businesses in tier 2 and 3 counties, respectively)	15 years
Alabama	All business entities	50 new jobs (no requirement for businesses in chemical manufacturing, data center, engineering, design, research, metal,or toolmaking industries)	3% of the previous year's eligible payroll	100% of utility tax liability	Up to the first 10 years of a project	5 years
Georgia	Businesses in manufacturing, telecommunications, broadcasting, warehousing & distribution, research and development, processing and tourism industries	25 new jobs in developed counties	$1,250 for each qualified job in devloped counties	50% of corporate income tax liability	5 years	10 years
Kentucky	Businesses in manufacturing, agribusiness, nonretail and technology industries, or classified as regional or national headquarters	10 new full-time jobs (90% of jobs with a minimum hourly wage of $10.88), and a minimum investment of $100,000	4% of gross wage of each new employee	100% of corporate income tax liability arising from the project	10 years (15 years in enhanced incentive counties)	Varies by tax incentive agreements
Mississippi	Businesses in manufacturing, processing, distribution, wholesaling, research and development, warehousing, or designated as air transportation, resort hotels, recreational facilities, movie studios, and technology intensive enterprises	20 new jobs for businesses in developed counties	2.5% of eligible payroll	50% of corporate income tax liability	5 years	5 years
North Carolina	Businesses in aircraft maintenance, air courier services hub, headquarters, call centers, information technology and services, manufacturing, research and development, motorsports, warehousing, and wholesaling	15 new jobs for businesses in developed counties	$750 for each qualified job in developed counties	50% of the taxpayer's state income, franchise or gross premium tax liability	Qualified for 1 year, but taken in 4 equal annual installments	5 years
South Carolina	Businesses in manufacturing, processing, agricultural packaging, warehousing and distribution, research and development, agribusiness, and qualifed technology intensive industries	Maintaining a monthly average of 10 new jobs	$1,500 for each qualified job in developed counties	50% of corporate income tax liability or premium tax liability	5 years	15 years

Source: Tennessee and Peer States' Department of Revenue and Department of Economic and Community Development

Analysis: Anderson Economic Group

Table B-2. Investment Tax Credits in Tennessee and Peer States

State	Who Qualifies	Min. Investment	Credit	Tax Base and Limit	Credit Length	Carryforward Period
Tennessee	Businesses in manufacturing, warehousing and distribution, headquarters and call centers	None	Up tp 10% of expenses on purchase, installation and repair of qualified industrial machinery depending on the size of the investment	50% of franchise and excise tax liability	One-time credit	15 years
Alabama	All business entities	$2,000,000 for existing facilities in Alabama	1.5% of a qualified capital invetsment	Up to 100% of income tax, financial institution excise tax, insurance premium tax and/or utility tax	Up to the first 10 years of a project	5 years
Georgia	Businesses in manufacturing and telecommunication support industries that have been in Georgia for at least 3 years	$50,000	Up to 8% of a qualified capital investment depending on the geographic location and the type of the investment	50% of corporate income tax liability	One-time credit	10 years
Kentucky	Businesses that agree to maintain 85% of full-time employment	$2,500,000 in eligible equipment and related costs	Up to 100% of corporate income tax liability arising from the project	100% corporate income tax liability	Up to 10 years	Varies by tax incentive agreements
Mississippi	Manufactures that have operated in Mississippi for at least 2 years	$1,000,000 in buildings and equipment	5% of eligible investment up to $1,000,000	50% of corporate income tax liability	One-time credit	5 years
North Carolina	Businesses in aircraft maintenance, air courier services hub, headquarters, call centers, information technology and services, manufacturing, research and development, motorsports, warehousing, and wholesaling	$2,000,000 for businesses in devloped counties	3.5% of the excess eligible investment amount over the threshold of $2,000,000	50% of the taxpayer's state income tax liability	Qualified for 1 year, but taken in 4 equal annual installments	5 years
South Carolina	Businesses in manufacturing industries	None	Up to 2.5% of business investment in new production equipment	100% of corporate income tax liability	One-time credit	10 years

Source: Tennessee and Peer States' Department of Revenue and Department of Economic and Community Development

Analysis: Anderson Economic Group

TABLE B-3. Headquarters Tax Credits in Tennessee and Other States

State	Program Name	Eligibility	Credit	Tax Base	Carryforward Period
Tennessee	Headquarter Tax Credit	▪ The company must establish either a national or global headquarter, invest a minimum of $10 million and create 100 new full-time qualifed jobs in Tennessee. ▪ The company must pay 150% of the state average wage for each qualified job.	Equivalent to all sales and use taxes paid on qualified personal property directly related to the creation of the jobs	Franchise and excise tax	15 years
Indiana	Headquarters Relocation Tax Credit	The company must complete a qualifying project, incur relocation costs, and employ at least 75 employees in Indiana. ▪ The company must have a minumim revenue of $50,000,000.	Up to 50% of a corporation's approved costs of relocating its headquarters to Indiana	Corporate Income tax	9 years
Mississippi	National or Regional Headquarters Tax Credit	▪ The company must create a minimum of 20 qualified jobs within a one-year period.	$500 per full-time employee per year for a five-year period	Corporate income tax	5 Years
South Carolina	Corporate Headquarters Credit	▪ The company must create a minimum of 40 new full-time jobs that are engaged in corporate headquarters or research and development. ▪ The facility must be the sole corporate headquarters within the region or nation.	Up to 20% credit based on the cost of the actual portion of the facility dedicated to the headquarters operation or direct lease costs for the first fives years of operation	Corporate income tax or corporate license fee	10 years
West Virginia	Corporate Headquarters Credit	▪ The company must create a munimum of 15 new jobs (including relocated employees) within the first year.	Up to 10% of the corporate's adjusted qualified investment	Business and occupation tax, corporate net income tax, and personal income tax on certain pass-through income	13 years
Wisconsin	Economic Development Credit	▪ The company must engage in at least one of the following eligible activities: job creation, training, capital investment and/or corporate headquarters location or retention	Up to 10% of the annual wage of positions created or retained for eligible employees	Corporate income and franchise tax or insurance premiums tax	15 years

Source: Tennessee, Indiana, Mississippi, South Carolina, West Virginia and Wisconsin's Department of Revenue and Department of Economic and Community Development
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Analysis: Anderson Economic Group

Appendix C. Research and Data Sources

We used the following sources to determine estimates for economic impact of business tax credits in Tennessee. Firstly, we used data from various agencies in Tennessee's state government. Then, we performed a detailed literature review on the most relevant and rigorous economic research pertaining to the impact of credits like those provided in Tennessee.

DATA SOURCES

The following sources were used to provide data for our analysis in calculating any figures referenced in this report:

Jobs Tax Credit Employment Analysis

- Data from the Tennessee Department of Labor and Workforce Development

Industrial Machinery Tax Credit Economic Impact

- Data from the Tennessee Department of Revenue
- Data from the Bureau of Economic Analysis, National Distribution Cost Tables
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Community Investment Tax Credit

- Data from the Tennessee Department of Revenue
- Data from the Tennessee Housing Development Agency

Small Business and Rural Opportunity Funds Credit

- Data from the Tennessee Department of Revenue
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Appendix D. About AEG

Anderson Economic Group, LLC is a boutique consulting firm founded in 1996, with offices in East Lansing, Chicago, New York, and Istanbul. Our team has a deep understanding of advanced economic modeling techniques and extensive experience in multiple industries in multiple states and countries. We are experts across a variety of fields in tax policy, strategy and business valuation, public policy and economic analysis, and market and industry analysis.

The consultants at Anderson Economic Group are often published on topics within their respective fields of expertise. Publications from our team include:

- *Annual State Business Tax Burden Rankings,* published since 2007.
- *The State Economic Handbook,* published by Palgrave Macmillan, 2008, 2009, and 2010.
- *Applied Game Theory and Strategic Behavior,* published in 2009.
- *The Economics of Business Valuation: Toward a Value Functional Approach,* published by Stanford University Press in 2013.
- *Business Economics and Finance with MATLAB®, GIS, and Simulation Models,* published in 2000.

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