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Tax Incentive Evaluation: Georgia Low-Income Housing Tax Credit

Robert D. Buschman
Peter S. Bluestone
Jonatas Teixeira Prates
Kshitiz Shrestha
Nicholas I. Warner

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Prepared by:

Georgia State University
Fiscal Research Center

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Authors:

Robert D. Buschman*
Peter S. Bluestone
Jonatas Teixeira Prates
Kshitiz Shrestha
Nicholas I. Warner

* Associate director and principal investigator; rbuschman1@gsu.edu

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

Executive Summary

Georgia’s Low-Income Housing Tax Credit (LIHTC) was enacted in 2000 to enhance incentives provided by the federal tax credit program of the same name for the development of affordable housing to meet the needs of lower-income families in the state. The purpose of this report is to evaluate the Georgia LIHTC, in accordance with the provisions of O.C.G.A. § 28-5-41.1 (2021 Senate Bill 6), in terms of its fiscal and economic impacts, as well as its public benefits. In addition, the report describes the terms and qualifications for the federal LIHTC upon which the Georgia credit is based, and discusses the administration of the program in Georgia, similar programs in other states, other federal incentives targeting the same activity, and other research into federal or state LIHTC programs. Key findings are summarized below.

Net Change in State Revenue

As detailed in section V of this report, we estimate that LIHTC claims by Georgia income and insurance premium taxpayers will be approximately \$331 million in state fiscal year (FY) 2023 and by approximately \$1.74 billion over the five-year period FY2023-27. These amounts represent the state tax expenditures for the program over the respective periods from utilization of credits earned on LIHTC projects during these periods or carried forward from earlier periods, and excluding credits carried forward to subsequent periods.

Section VI of the report evaluates the state revenue impacts of a representative year’s LIHTC projects on a present-value basis, including the cost of tax credits claimable over ten years from project completion, offsetting revenue gains from economic activity – direct, indirect, and induced – during the construction phase of the projects and the first 15 years of operations, and the value of revenue gains from the hypothetical *alternate use* of funds on general government expenditures.

Using Department of Community Affairs data for 2020 “9-percent credit” projects and 2019 “4-percent credit” projects, the present value of credits generated is estimated to be \$749.4 million. This state revenue reduction is partially offset by approximately \$116.6 million of state revenue from construction phase activity and the present value of operating phase revenues. Finally, the present value of state revenue gains from the alternate use of the ten years of tax expenditures is estimated at \$51.6 million. The resulting net state revenue impact of a representative year’s LIHTC projects is estimated to be a loss of approximately \$684.4 million. This estimated loss is before consideration of how much of the LIHTC construction and operating activity is attributable to the availability of the state credit or would have occurred even without it, referred to below as the “but for” analysis.

Local revenue gains during the construction and operating phases of the projects, again net of gains from the alternate use of state funds, are estimated at approximately \$322.2 million on a present-value basis. The combined state and local revenue impact is thus estimated to be a loss of approximately \$362.2 million, again before consideration of the “but for” question.

Net Change in State Expenditures

Administration of the LIHTC program is conducted by three state agencies: the Department of Community Affairs, Department of Revenue, and Office of Insurance and Fire Safety Commissioner. These agencies estimate the annual cost in state funds for administration, in thousands, as follows:

• Department of Community Affairs	\$0.0*
• Department of Revenue	\$84.1
• <u>Office of Insurance and Fire Safety Commissioner</u>	<u>\$4.2</u>
<u>Total</u>	<u>\$88.3</u>

* DCA administration of the state and federal programs is supported by fee revenue; no state funds are used.

Net Change in Economic Activity

Economic activity associated with LIHTC projects is estimated in two steps, the first being a standard IMPLAN analysis (described more fully in section VI) of direct, indirect, and induced effects of a representative year's projects, without consideration of causality. That is, we assume that, but for the availability of the state credits, none of the projects receiving the credits would have been undertaken. This assumption is a common simplification of economic impact analyses, but it is not likely realistic. In fact, we know that low-income housing units are constructed in states without similar state incentives.

The degree to which projects would or would not have been undertaken absent the state LIHTC is ultimately an empirical question. As a second step, we use data from the U.S. Department of Housing and Urban Development and other sources to empirically test whether the number of low-income housing units built in Georgia after enactment of the state-level LIHTC is statistically greater than the number one should expect with only the federal LIHTC and other federal subsidies. With data covering 30 years (1990-2019) of LIHTC projects nationally, we statistically match Georgia census tracts to economically and demographically similar census tracts in states with no state-level LIHTC or similar program to estimate a *treatment effect* of the state credit in terms of the number of units placed in service in Georgia census tracts over and above the number placed in service in the matched, untreated census tracts in other states. Section VII details this step of the analysis.

IMPLAN Analysis

Results of step one, the IMPLAN analysis, suggest that the representative year's projects, involving total investments of about \$1.84 billion in construction and soft costs, resulted in total direct, indirect, and induced output of about \$3.65 billion during the construction phase of the projects and about \$81.3 million annually during the operating phase. In terms of economic value added, IMPLAN's measure corresponding to state GDP, the total impact is estimated at \$2.36 billion during construction and \$67.6 million per year in operation.

On a present-value basis, the construction and first 15 years of operations of LIHTC developments are associated with gross output of about \$4.78 billion. Net of the economic impacts of the alternate use of tax credit funds for generic state expenditures, the net output change is estimated at about \$3.29 billion.

“But-For” Analysis

The empirical analysis in step two finds that, over the period from enactment of the Georgia LIHTC through 2009, there is a statistically significant, positive effect of the state credit on the number of low-income units placed in service. However, results suggest that many of the projects would likely have occurred even in the absence of the state credit. The estimated “treatment effect” of the state-level incentive suggests that around 13.5 thousand low-income units placed in service from 2000 through 2009, or about 21 percent of the total placed in service over that period, could fairly be attributed to the presence of the state credit.

Net Change in Public Benefit

Providing a family safe and secure long-term housing has benefits for the public as well as the family, including on health and health spending, public safety, and educational outcomes, three areas that loom large in state and local government budgets. Measuring them is difficult and beyond the scope of this evaluation, but there is a body of research supporting these public benefits of affordable housing. Nevertheless, based on the empirical analysis in this report, it appears that the Georgia LIHTC has partially contributed to the realization of these benefits by boosting growth in the supply of affordable housing units beyond that which we would expect absent the state credit.

On an economic and fiscal basis, we find net public benefits as summarized in Table ES1 below. For the economic net benefit, the gross output and state GDP associated with the included projects – including direct, indirect, and induced effects estimate in IMPLAN – are first adjusted based on the “but-for” analysis so as to reflect only the share of units likely not to have been built in the absence of the state credit. Second, they are adjusted for the opportunity cost of the state tax expenditures on credits, the output and state GDP associated with spending the same amount on a basket of government programs and services in proportion to recent state budget breakdowns.

For the fiscal benefits, positive revenues associated with the construction and operation of the low-income housing projects are first adjusted to reflect opportunity costs (the revenues associated with the alternate use of funds) and the tax expenditure the cost of the credits, then to reflect only the units our analysis finds are attributable to the state credits.

Table ES1. Net Economic and Fiscal Benefits of the Georgia LIHTC*

<i>(\$ millions)</i>	Output	State GDP	State Revenue	Local Revenue
All LIHTC Units	\$4,783.8	\$3,297.3	\$116.6	\$340.9
Less:				
Opp. Cost of Tax Expenditures	(1,769.9)	(1,099.3)	(51.6)	(18.7)
Tax Expenditures			(749.4)	
Subtotal	\$3,013.9	\$2,197.9	(\$684.4)	\$322.2
Less:				
Expected Units w/o State Credit	(3,587.9)	(2,472.9)	(87.4)	(255.7)
Net Benefit	(\$574.0)	(\$275.0)	(\$771.8)	\$66.6

* Estimates for 2019 4-percent and 2020 9-percent credit projects on a present-value basis, in 2020 dollars.

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I. Introduction

Georgia's Low-Income Housing Tax Credit (LIHTC) was enacted in 2000 to enhance incentives provided by the federal tax credit program of the same name for the development of affordable housing to meet the needs of lower-income families in the state. The purpose of this report is to evaluate the Georgia LIHTC, in accordance with the provisions of O.C.G.A. § 28-5-41.1 (2021 Senate Bill 6), in terms of its fiscal and economic impacts, as well as its public benefits. In addition, the report describes the terms and qualifications for the federal LIHTC upon which the Georgia credit is based, and discusses the administration of the program in Georgia, similar programs in other states, other federal incentives targeting the same activity, and other research into federal or state LIHTC programs.

This report was prepared under contract with the Georgia Department of Audits and Accounts, and with their assistance in obtaining estimates of the program's administrative costs. Program information used in the report was obtained from the Georgia Department of Community Affairs (DCA), Department of Revenue (DOR), and Office of Commissioner of Insurance and Fire Safety (OCI) as well as the U.S. Department of Housing and Urban Development (HUD).

The report proceeds first with the background, terms and structure, and descriptive data on the federal and Georgia LIHTCs, followed by discussion of other states' programs, the direct fiscal impacts of the Georgia credit and its administration, the analysis of the economic and net fiscal impacts of a representative year of credit-eligible projects, and an analysis of the public benefits of the program in terms of its presumed goal of improving housing affordability in the state.

II. The Federal Low-Income Housing Tax Credit

Background

The federal LIHTC is the nation's largest supply-side housing program, designed to subsidize the construction of low-income housing units through the use of federal income tax credits. Initially enacted for three years as part of the Tax Reform Act of 1986 and subsequently extended, the LIHTC was made permanent in 1993, by which time LIHTC developments accounted for "25% of all new multi-family residential construction nationally and 'virtually all' housing for households with incomes under \$15,000," according to U.S. Senate hearing records cited by the Tax Foundation.¹ Since 1986, LIHTCs have helped fund 3.23 million housing units in more than 48 thousand developments across the nation, according to HUD.²

How Does the LIHTC Work?

The LIHTC program provides nonrefundable, transferable income tax credits to developers to subsidize new construction and rehabilitation of housing for low-income families, subject to affordability standards set by HUD. Affordability of a housing unit generally means that the cost of rent and utilities does not exceed 30 percent of the tenant's adjusted income, or gross income less certain deductions, such as those for dependents, childcare, elderly or disabled family members, and others. Units to be counted as affordable are subject to maximum rents based on certain percentages of the area median income (AMI) where the unit is located (county or MSA), adjusting for unit size (bedrooms) and family size. Projects earning credits must, at a minimum, set aside either 20 percent of units for tenants with incomes up to 50 percent of AMI or 40 percent for tenants with incomes up to 60 percent of AMI.³ These affordability requirements apply over a 30-year period from the units being placed in service and are subject during the 15-year initial compliance period to Internal Revenue Service (IRS) and state housing finance authority (HFA) reporting requirements, with credits subject to recapture if the affordability and reporting requirements are not met.

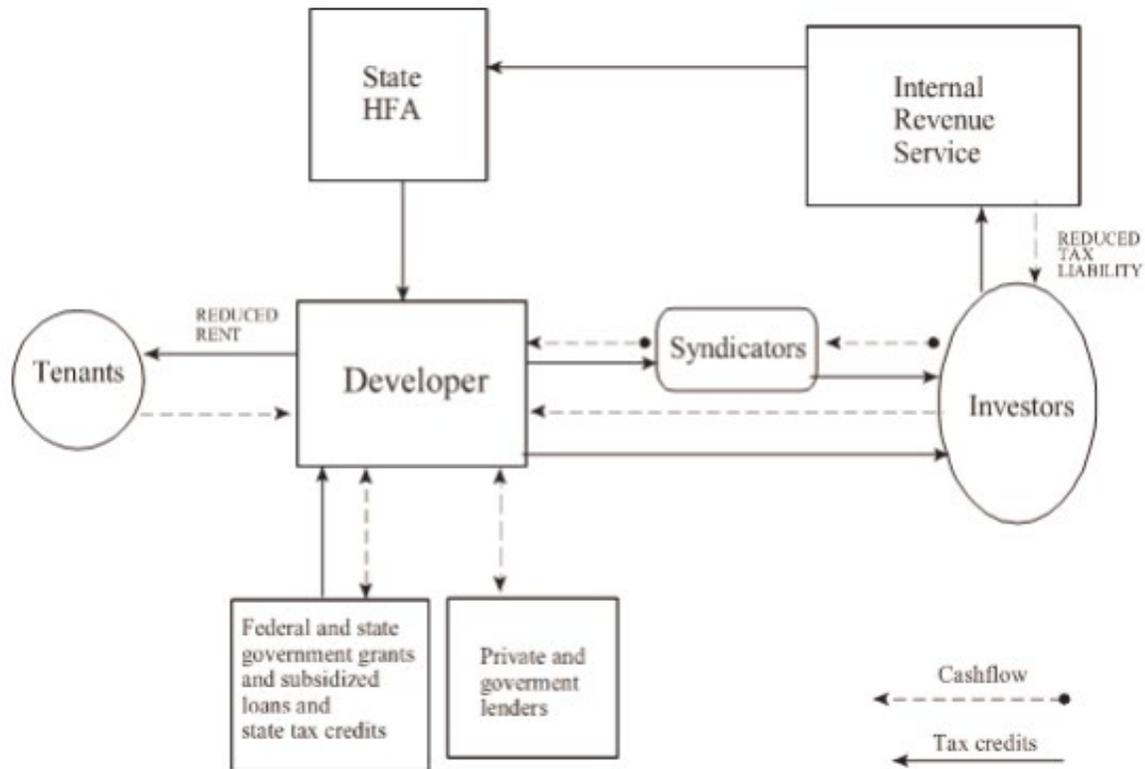
LIHTCs are fully transferable by the developer to investors in the project and are typically sold to banks or other investors to finance the projects, often in a syndication process through underwriters specializing in tax-credit investments. Projects typically also use mortgage financing or, in some cases, tax exempt bond financing to fund a portion of the projects' costs. Projects may also receive subsidized, below-market financing through HUD's HOME Investment Partnership Program or U.S. Department of Agriculture programs as well as direct grants. Figure 1 illustrates the parties as well as the flows of credits and financing typically involved in the funding of a LIHTC project.

¹ Stamm, Everett, and Taylor LaJoie, "An Overview of the Low-Income Housing Tax Credit", Fiscal Fact No. 722, August 2020, available at <https://taxfoundation.org/low-income-housing-tax-credit-lihtc/>

² "Low-Income Housing Tax Credits", Department of Housing and Urban Development, Office of Policy Development and Research, <https://www.huduser.gov/portal/datasets/lihtc.html>, accessed April 12, 2022

³ The 2018 Consolidated Appropriations Act relaxed the income limits such that low-income units may be rented to families with incomes up to 80 percent of AMI provided that the average income for all subsidized units remains below 60 percent of AMI. See Stamm and LaJoie 2020.

Figure 1. Financing and Credit Flows in a Typical LIHTC Development Project



Source: Congressional Research Service (see note 8)

Credit Structure and Value

The value of the LIHTC varies by the type of credit – so-called 9-percent and 4-percent credits – and is dependent on project costs and the use of tax-exempt funding sources. Qualifying expenses include hard construction or rehabilitation costs such as building materials and labor, as well as soft costs such as legal expenses, financing costs, permitting and other local government fees, and architecture and engineering fees. Tax credits for any project are spread over a period of 10 years, beginning with the year the project is placed in service.

While the credits are often referred to as 9-percent and 4-percent credits, the law governing these credits, 26 U.S. Code § 42, refers to them as “70 percent present value” and “30 percent present value” credits. As originally written, the law set the applicable credit rates such that, given current interest rates, the present value of the 10-year stream of credits is equal to either 70 percent or 30 percent of the qualified basis of the property.⁴ The discount rate used for the present value calculation is set by law based on market rates on U.S. government obligations,

⁴ For example, a 9-percent per year credit for ten years would have a present value equal to 70 percent of the project’s qualified basis if the applicable discount rate is about 4.85 percent. The discount rate is set by law at 72 percent of the average of the applicable federal mid-term and long-term rates for the period in which the project is approved for credits. These applicable federal rates are determined in accordance with 26 U.S. Code § 1274 and published monthly by the IRS at <https://www.irs.gov/applicable-federal-rates>.

thus the applicable credit percentages would ordinarily fall or rise with the discount rate. However, legislation enacted in 2008 set a floor of 9 percent for the 70-percent present value credits and further legislation signed in 2020 set a floor of 4 percent for the 30-percent present value credits. Thus, for the time being, the two credits are valued at 9 percent or 4 percent of the qualified basis in the project per year for 10 years, starting in the tax year in which the project is placed in service.⁵

In addition to having different credit rates, the key differences between the two credit types are as follows:

- **9-percent credits** are available for new construction or rehabilitation of existing structures for affordable housing. These credits are allocated to projects on a competitive basis, administered by each state HFAs under its Qualified Allocation Plan (QAP) outlining its priorities and scoring criteria, and are subject to annual allocation caps for each state and U.S. territory. Allocation caps were initially set at a rate of \$1.25 per capita, but this rate was increased to \$1.50 in 2001, \$1.75 in 2002, and adjusted for inflation thereafter. A minimum allocation for small states was also established effective 2001.

For 2022, state caps are the greater of \$2.60 per capita or \$2.975 million, the small state minimum for this year.⁶ These figures are lower than those applicable for 2021, \$2.8125 per capita and \$3.246 million respectively, because of the expiration of a 12.5-percent increase in the statutory amounts for four years under the Consolidated Appropriations Act of 2018.

- **4-percent credits** are available on a non-competitive basis for acquisition and rehabilitation of existing housing or for new construction that is federally subsidized through tax-exempt bond financing or other subsidy programs. These credits are not capped.

Federal LIHTC by the Numbers

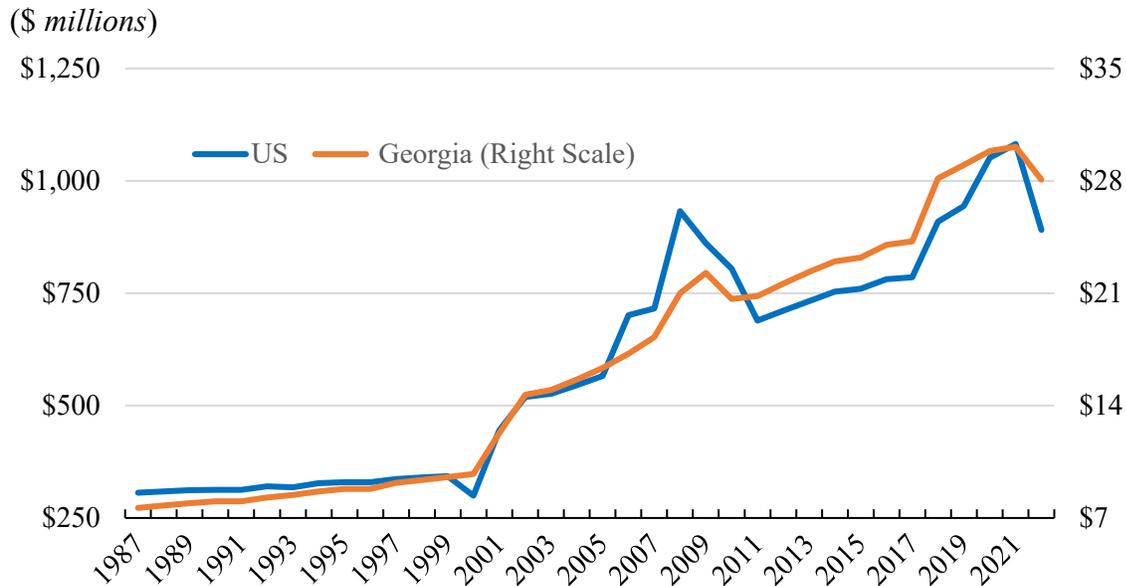
Summarizing the LIHTC program at the federal level, we begin with the annual amounts of 9-percent credits available by law each year. The cap each year starts from the individual state caps based on the statutory per capita rates and population estimates published each year by the IRS (see note 5 for the latest). Supplemental appropriations have been made in at least nine of the program's 35 years, sometimes increasing the per capita and small state amounts for all states, as noted above for 2018-21, or sometimes temporarily increasing the caps for specific states due to major disasters. The Housing and Economic Recovery Act of 2008 increased the caps for all states in 2008-09 while state-specific increases were authorized at four other times, applicable to

⁵ The legislation setting floors for the applicable credit rates are Housing and Economic Recovery Act of 2008 and the Consolidated Appropriations Act of 2021, respectively. Absent the floors, April 2022 applicable credit percentages would be 7.47 and 3.20 percent per year for the 70-percent and 30-percent present value credits, respectively. The credit rates would rise above 9 percent and 4 percent, respectively, if the applicable discount rate rose above about 4.84 percent or 5.54 percent.

⁶ Internal Revenue Bulletin: 2022-12, Part III: Notice 2022-12, https://www.irs.gov/irb/2022-12_IRB#NOT-2022-12

22 states and U.S. territories.⁷ The total 9-percent credit allocation cap for the U.S., along with that for Georgia, are shown in Figure 2 below.

Figure 2. Federal 9-percent Credit Allocation Cap – US and GA, 1987-2022



Sources: IRS, Novogradac, US GAO, and authors' calculations

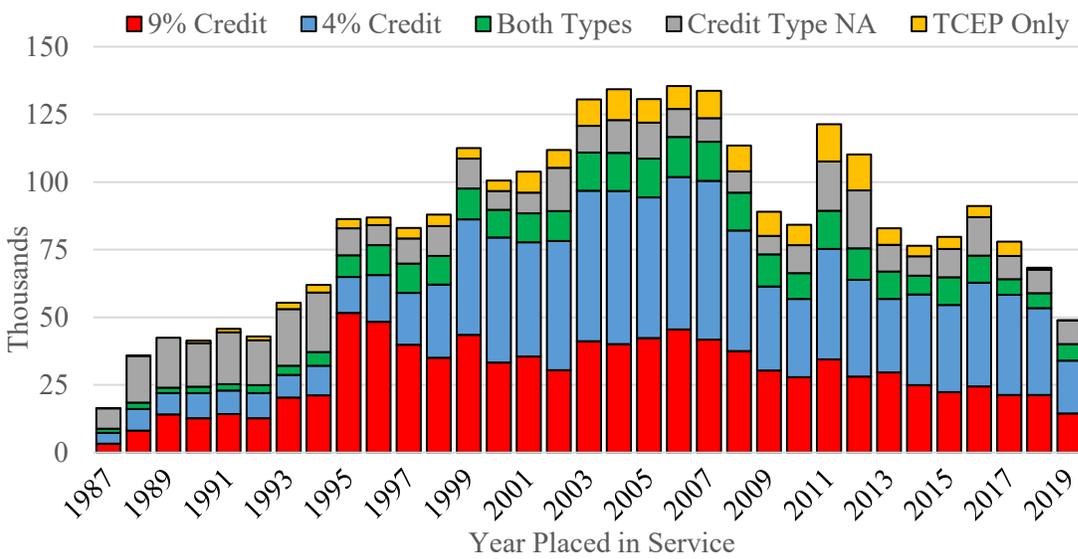
Figure 3 shows the number of low-income units – i.e., those units within a LIHTC project set aside for qualifying low-income tenants – coming into service each year by credit type, where available. The category labeled “both” indicates that the development received credits of both types, but for different portions of the project. “TCEP” refers to projects receiving funding through the Tax Credit Exchange Program, under which state HFAs can exchange unused credits allocated to abandoned projects (or where investors backed out of their credit purchases) for cash from the U.S. Treasury, at a discount, to complete the projects.⁸ Some project records in the HUD database do not identify the credit type, so these are included as a separate category.

Figure 4 shows the total low-income units placed in service each year along with the average value per unit of the annual credits awarded. Note that the average credit earned per unit roughly doubled from 2005 to 2010 and rose another 50 percent over the next 4 years, suggesting the amount of subsidy to gain one low-income unit has risen sharply even as the numbers of units placed in service fell during the Great Recession.

⁷ See Novogradac web graphic, “New 9% Allocations Available Each Year”, available at <https://www.novoco.com/sites/default/files/thumbnails/image/novogradac-lihtc-per-capita-lihtcs-032021.gif>. Disaster-related allocations that did not increase the per capita allocation amount nationally were made in the GO Zone Act of 2005 for three states hit by hurricane Katrina, the Emergency Economic Stabilization Act of 2008 for hurricane Ike and midwestern weather disasters affecting parts of ten states, the Further Consolidated Appropriations Act of 2020 for the 2017-18 California wildfires, and the Consolidated Appropriations Act of 2021 for non-COVID disaster declarations in 11 states plus Puerto Rico.

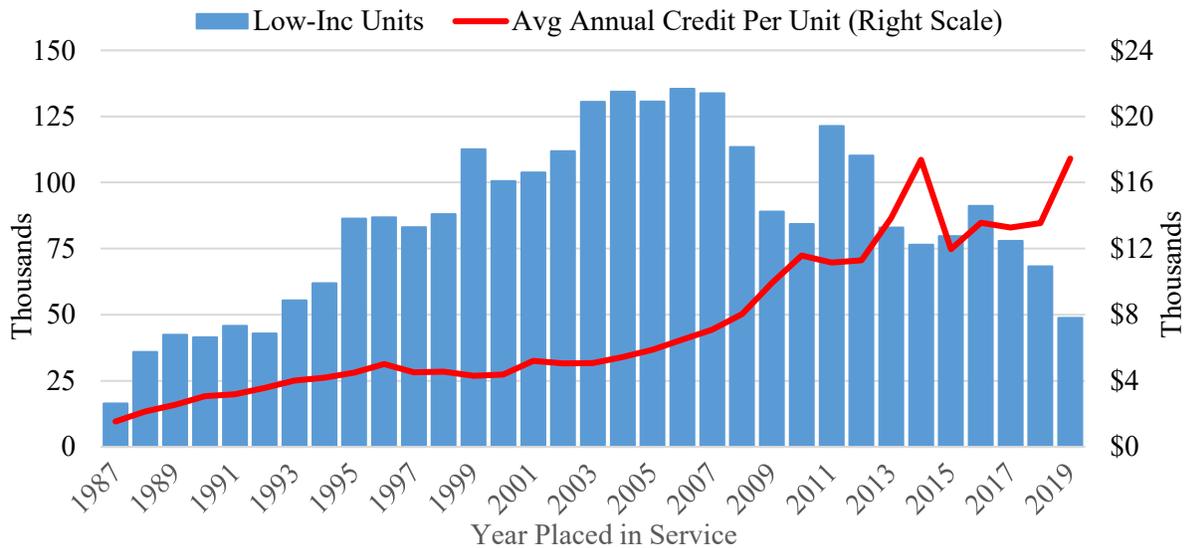
⁸ TCEP was originally enacted under the American Recovery and Reinvestment Act of 2009 (ARRA). See Stamm and LaJoie 2020 for more information.

Figure 3. U.S. Low-Income Housing Units by Credit Type, 1987-2019



Source: HUD LIHTC database, available at <https://www.huduser.gov/portal/datasets/lihtc.html>

Figure 4. Total U.S. Low-Income Units and Average Annual Credit per Unit, 1987-2019



Source: HUD LIHTC database

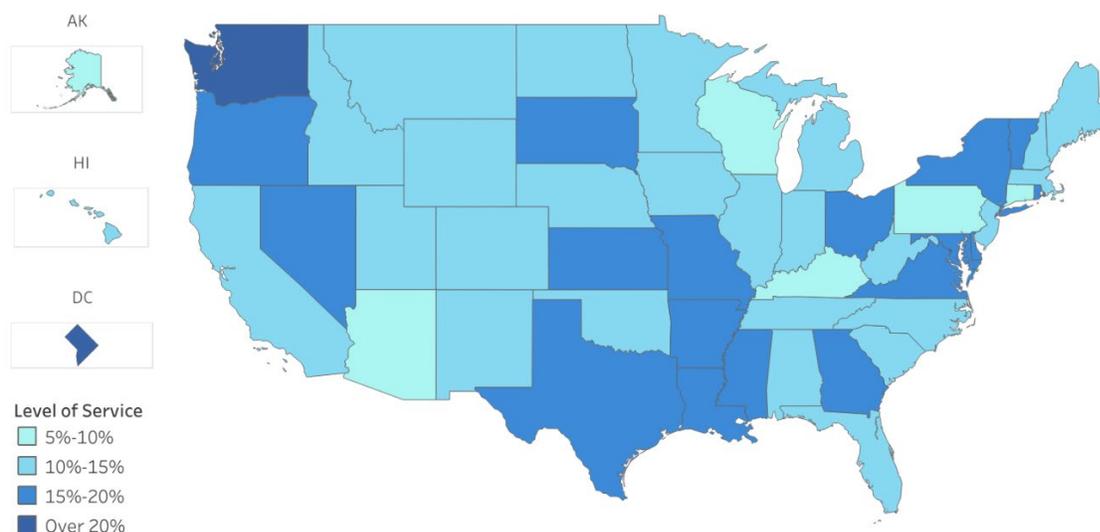
A note of caution is in order regarding these HUD data. The figures above show low-income units by year placed in service, but a significant share of records in the HUD database are missing that field and are thus not included above.⁹ In addition, there are often extended delays

⁹ Many others are missing the allocation year (in which the project application for credits was approved) and many are missing both. Over all states and years, 8.0 percent of records do not have a placed-in-service year, 7.2 percent

in reporting by the states to HUD and in compilation and publication of the data by HUD, so it is likely that these data materially understate the units placed in service for the last 5-7 years shown and particularly in the most recent three years that show a resumed decline.

Finally, Figure 5 shows the distribution of low-income housing units built since the inception of the program across all states, relative to the number of eligible families in the state as of 2019. This figure provides a rough indication of the level of service provided by credit-funded housing units toward meeting the needs of low-income families in each state. Of course, needs for affordable housing and the level of service to meet those needs may vary widely within states.

Figure 5. Cumulative Low-Income Housing Units per 2019 Eligible Family*, by State



Sources: HUD LIHTC database, available at <https://www.huduser.gov/portal/datasets/lihtc.html>; American Community Survey, U.S. Census Bureau; and authors’ calculations

* Includes low-income units in LIHTC projects placed in service 1987-2019. Eligible families estimated using ACS 5-year estimates, as of 2019, of median family income and families by income level on a county basis, to correspond as closely as possible to HUD area definitions used in setting tenant income limits, then aggregating to the state level.

Reviews of the Federal LIHTC Program

Since a few years after its launch, the LIHTC has been the subject of a series of reviews and evaluations by HUD, the Congressional Research Service (CRS), and the U.S. Government Accountability Office (GAO), an audit by the Treasury Inspector General for Tax Administration (TIGTA), and others.¹⁰ Some key findings of these reports are outlined here.

do not report the allocation year, and 4.2 percent report neither. In low-income unit terms, records representing 9.9 percent of units do not report the placed-in-service year, 10.1 percent report no allocation year, and 5.7 percent report neither.

¹⁰ ICF Inc. (1991), “Evaluation of the Low-Income Housing Tax Credit — Final Report”, prepared under contract for HUD, <https://www.huduser.gov/portal/publications/Evaluation-of-the-Low-Income-Housing-Tax-Credit-Final-Report.html>; CRS (2008), “The Low-Income Housing Tax Credit: A Framework for Evaluation”, CRS Report for

- GAO found that state HFAs’ QAPs sometimes lacked selection criteria required by law and agencies were able to boost the qualifying basis used to determine credit amounts in order to improve financial feasibility, without documenting justifications for the boost. “IRS had not reviewed the criteria allocating agencies used to award discretionary basis ‘boosts,’ which raised concerns about over-subsidizing projects (and reducing the number of projects funded).”¹¹
- TIGTA found that the IRS provides minimal oversight of HFAs, conducting compliance reviews of only eight of 56 agencies from 2003 through 2019, and reviewing none in 2020-21 due to pandemic limitations. TIGTA also concluded that “unreliable controls and processing delays for [HFA] forms” and “unreliable and missing building owner data resulted in undetected errors and noncompliance.”¹²
- GAO also found that “weaknesses in data quality and federal oversight constrain assessment of LIHTC development costs and the efficiency and effectiveness of the program,” and that only “a limited number of [HFAs] had implemented controls to address the risk of fraud involving misrepresentation of contractor costs.”¹³

In addition, the Tax Foundation cites a 2009 study suggesting that construction costs of LIHTC projects are higher than for average quality, unsubsidized projects. The study’s author concluded that LIHTC units are 20 percent more expensive per square foot to produce.¹⁴ GAO suggested some explanations of higher construction and other costs, including:

- Criteria in state QAPs favoring projects in HUD-designated Difficult Development Areas (DDAs), Qualified Census Tracts (QCTs), or other areas with higher costs;
- Criteria requiring or favoring “green building” or other relatively more costly design features, construction methods, and materials as well as added inspections and reporting costs; and
- Complex financing structures resulting in higher soft costs for syndication and other financing fees, legal expenses, and other related costs.¹⁵

Finally, CRS raises efficiency issues over the cost effectiveness of supply-side versus demand-side – i.e., production versus tenant – subsidies in providing affordable housing, particularly given the high subsidy levels for LIHTC projects. The base credits add up to around 30 or 70

Congress No. RL33904, <https://www.everyersreport.com/reports/RL33904.html>; CRS (2019), “The Low-Income Housing Tax Credit: Policy Issues”, *In Focus*, <https://crsreports.congress.gov/product/pdf/IF/IF11335>

¹¹ GAO (2017), “Low-Income Housing Tax Credit: Actions Needed to Strengthen Oversight and Accountability”, GAO-17-784T, <http://www.gao.gov/products/GAO-17-784T>

¹² TIGTA (2022), “Oversight of the Low-Income Housing Tax Credit Program Can Be Improved”, Report No. 2022-30-012, <https://www.treasury.gov/tigta/auditreports/2022reports/202230012fr.pdf>

¹³ GAO (2018), “Low-Income Housing Tax Credit: Improved Data and Oversight Would Strengthen Cost Assessment and Fraud Risk Management”, GAO-18-637, <https://www.gao.gov/products/gao-18-637>

¹⁴ Ericksen, Michael D. (2009), “The market price of Low-Income Housing Tax Credits”, *Journal of Urban Economics* 66: 141-49 (cited in Stamm and LaJoie 2020).

¹⁵ GAO 2018. A 2021 report from the Turner Center for Housing Innovation at UC Berkeley also concludes that complex financing structures for LIHTC projects “impose inefficiencies that add to ... total costs. Kneebone, Elizabeth, and Carolina Reid (2021), “The Complexity of Financing Low-Income Housing Tax Credit Housing in the United States”, <https://turnercenter.berkeley.edu/wp-content/uploads/2021/04/LIHTC-Complexity-Final.pdf>.

percent of eligible costs on a present value basis, more or less depending on discount rates, and can be boosted for projects in DDAs and QCTs to around 39 and 91 percent. Other potential subsidies for these projects include direct federal, state, local, and private grants; tax exempt bond financing or other subsidized borrowing; and other tax credits including state LIHTCs and in some cases historic rehabilitation credits.

III. Georgia’s Low-Income Housing Tax Credit

History

Georgia’s LIHTC was enacted in 2000 and effective for qualifying projects placed in service after January 1, 2001. The program is governed under O.C.G.A. § 48-7-29.6 for purposes of state income taxes. Legislation in 2001 enabled insurers to claim the credit against their state insurance premium tax (IPT) liabilities as well, governed under O.C.G.A. § 33-1-18. A technical correction to the latter code section, enacted in 2003, is the last time either code section has been amended.¹⁶

Credit Terms and Administration

The Georgia LIHTC is a 100-percent match of the federal LIHTC for qualified projects located in the state, subject to the same compliance and recapture provisions as under the federal law. The amount of credits a taxpayer may use in any year is limited by the amount of income tax or insurance premium tax liability for that year. Unutilized credits in any year may not be carried back to offset prior years’ liability, but they may be carried forward and used against the subsequent year’s liability for up to three years. DOR and OCI are responsible for administration of the credits for purposes of income taxes and IPT, respectively, including carryforwards and recaptures, if any, as well as initial claims.

DCA serves as Georgia’s designated HFA for purposes of allocations of the federal and state LIHTC, including setting and administering the QAP for 9-percent credits as well as administering and approving applications, and enforcing reporting and ongoing compliance requirements for both 4- and 9-percent federal and state credits. Georgia’s 2022 and earlier QAPs, detailing allocation priorities and scoring criteria for the 9-percent credit, information about application forms and processes, and related information and historical reports can be found on the DCA website, dca.ga.gov.

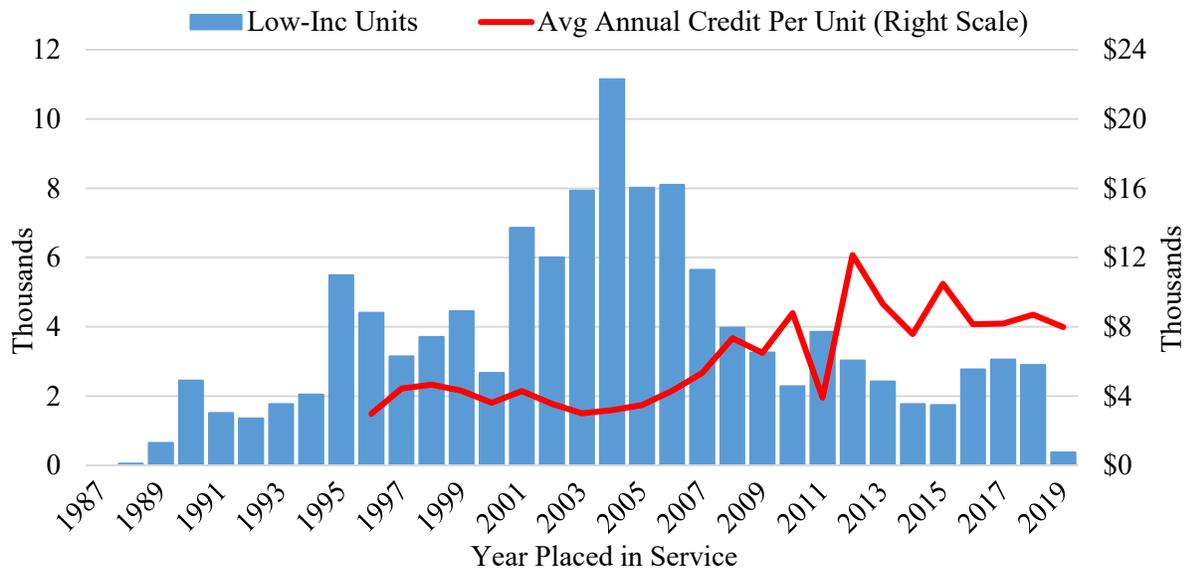
Georgia LIHTC by the Numbers

The numbers of low-income housing units placed in service and the average annual credit award per unit are shown in Figure 6 below. The patterns are similar to those for U.S. total units placed in service and average awards, except that Georgia experienced a much larger percentage increase in units placed in service from 2001 to the start of the Great Recession compared to the prior 5-7 years and, since the recession, saw slower growth in average credit awards per unit. The average annual units placed in service in Georgia in 2001-07 was up about 93 percent compared to the 1995-2000 period, versus only 35 percent nationally. The average award per unit in Georgia grew by about 5.7 percent annually from 2000 to 2007 and only 3.4 percent

¹⁶ Relevant legislation includes House Bill (HB) 272 (Ga. L. 2000, p 845) effective Jan. 1, 2001, HB 509 (Ga. L. 2001, p 1098) effective Jul. 1 2001, HB 460 (Ga. L. 2001, p 1181) effective Jan. 1, 2002, and HB 537 (Ga. L. 2003, p 640) effective Jun. 3, 2003.

annually from 2007 to 2019, while the national average award grew by 7.1 and 7.8 percent annually over the same periods, respectively.

Figure 6. Total GA Low-Income Units and Average Annual Credit per Unit, 1987-2019

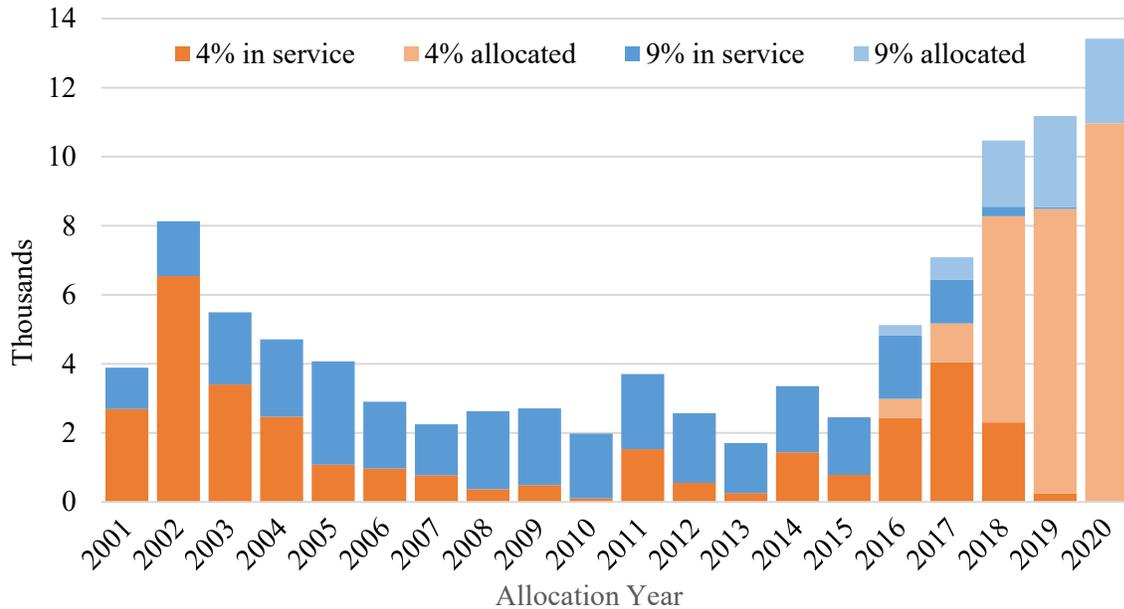


Source: HUD LIHTC database (Note that HUD 2019 units placed in service data appears incomplete.)

As discussed above in reference to the national data, Georgia records in the HUD database are also often lacking the placed-in-service year, allocation year, or both.¹⁷ Data from DCA suggest that the apparent continuing weakness in HUD-reported Georgia units since the Great Recession is overstated. In fact, the number of units receiving credit allocations has grown rapidly since 2015 to record levels the last three years of available data. However, many of the projects receiving allocations in 2017-18, most receiving them in 2019, and all receiving them in 2020 appear in the DCA data with the status “allocated” instead of “in-service” as of March 2021. DCA data on low-income units receiving 4-percent and 9-percent credit allocations in 2001-20 is presented in Figure 7.

¹⁷ 9.8 percent of records and 7.4 percent of units are missing placed-in-service year, 16.3 and 13.2 percent are missing allocation year, and 8.1 and 5.7 percent are missing both.

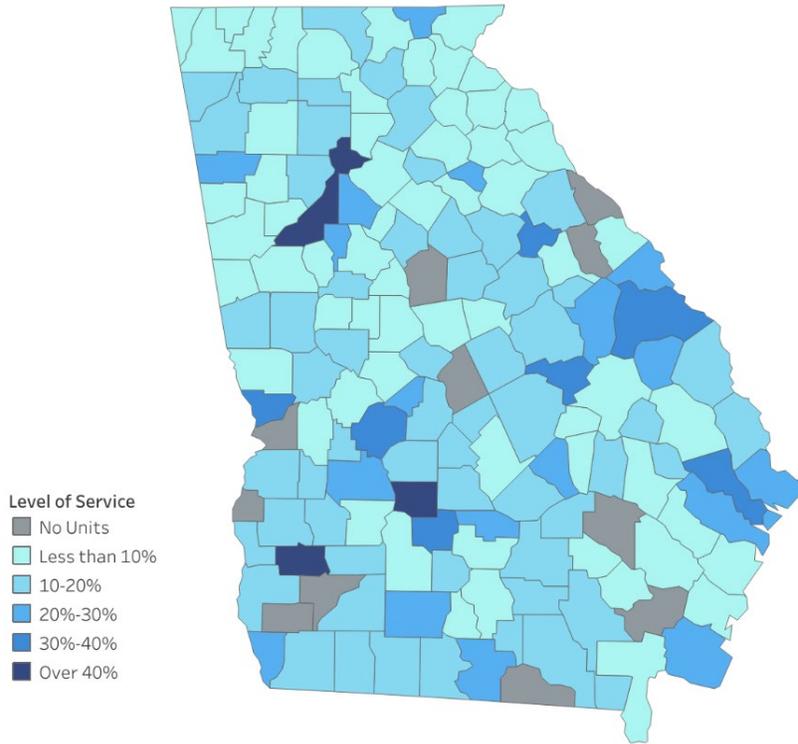
Figure 7. GA Low-Income Units Receiving Credit Allocations, 2001-2020



Source: DCA, downloaded from ArcGIS property tables for the Housing Tax Credit Properties Map (Mar 12, 2021) at <https://www.dca.ga.gov/safe-affordable-housing/rental-housing-development/housing-tax-credit-program-lihtc/qualified-0/2021>

Finally, as Figure 5 shows for the nation, Figure 8 shows for Georgia the distribution of low-income housing units built since 1987 across counties, relative to the number of eligible families in each as of 2019. As Figure 5 showed for states, this figure provides a rough indication of the level of service provided by credit-funded housing units toward meeting the needs of low-income families in each county.

Figure 8. Cumulative Low-Income Housing Units per 2019 Eligible Family*, by County



Sources: HUD LIHTC database; American Community Survey, U.S. Census Bureau; and authors' calculations.

* Includes low-income units in LIHTC projects placed in service 1987-2019. Eligible families estimated using ACS 5-year estimates, as of 2019, of median family income and families by income level on a county basis, to correspond as closely as possible to HUD area definitions used in setting tenant income limits.

IV. Other State Low-Income Housing Tax Credit Programs

To date, 20 states plus the District of Columbia have adopted state-level LIHTCs, beginning with California at the same time the federal credit began. The most recent to adopt was Arizona, effective this year.

Seven states, including Georgia, provide a 100-percent match of both federal credits while one, Maine, matches 4-percent credits and new-construction 9-percent credits. Five other states and the District of Columbia provide partial matches of the federal credits, while at least seven others provide affordable-housing credits under other terms or formulas not necessarily dependent on receipt of a federal LIHTC.

Figure 9 shows the jurisdictions with LIHTCs or similar affordable-housing supply incentives in each category. Summary characteristics of the programs are provided in Table 1. The reader will note that the latest tax expenditure report estimates of credits claimed in Georgia for FY 2022 is larger than for any other state for which an estimate was available, though other large states with a 100-percent match of the federal credit and no state cap – Pennsylvania, the only one larger than Georgia, along with Virginia, Arizona, and South Carolina – have only recently enacted the credit. The only other states larger in population than Georgia that have a state credit, California and New York, have lower credit rates or offer them on a discretionary basis.

Figure 9. States with LIHTC Programs

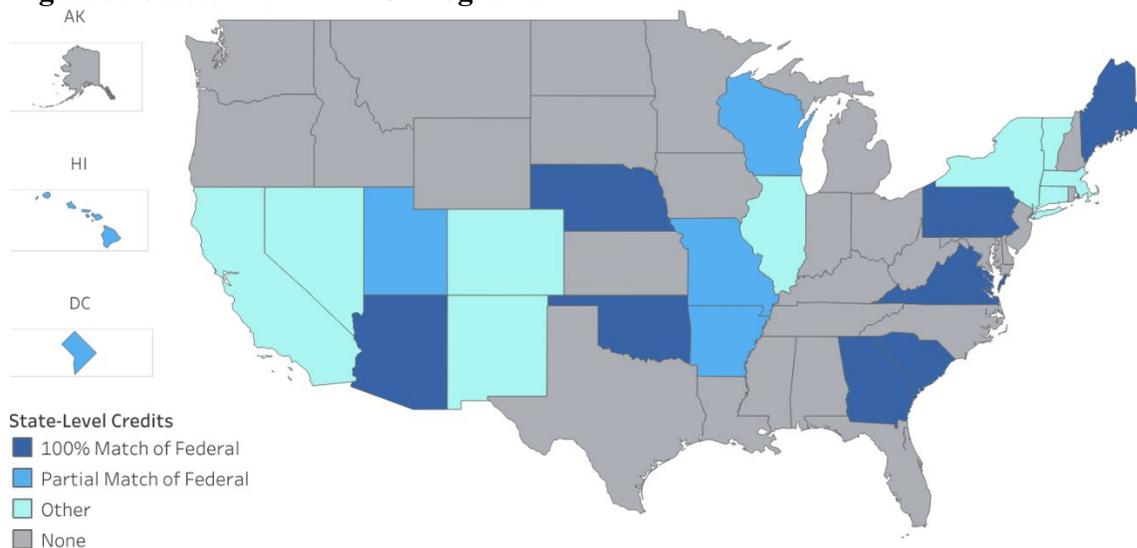


Table 1. Characteristics of State LIHTCs

State	Year Effective	Credit Description/Terms	Yearly Cap (annual amt of new credits)	Expected FY22 Credits Claimed
Arizona	2022	100% of federal credit (9- and 4-percent credit)	\$4M	N/A
Arkansas	1997	20% of federal 9-percent credit	None	\$459,260 (CY20)
California	1987	30% of eligible basis (9-percent credit) 13% of eligible basis (4-percent credit)	None	\$50M
Colorado	2014	30% of qualified basis (9-and 4-percent credit)	\$10M	Not available
Connecticut	1988	Non-profits developing qualified projects can receive up to \$500k in credits that can be sold to fund the projects.	\$10M	\$10.1M (FY21)
District of Columbia	2014	Up to 25% of federal credit (9-and 4-percent credit)	None	\$0
Georgia	2000	100% of federal credit (9- and 4-percent credit)	None	\$294M
Hawaii	2011	50% of federal credit (9- and 4-percent credit)	None	\$25M (FY19)
Illinois	2001	50% of donations to qualified non-profit sponsors developing affordable housing projects	None	\$20M (FY19)
Maine	2020	100% of federal credit for qualifying new units and 4-percent projects; 50% of qualified basis for other projects	\$10M	\$8.6M
Massachusetts	1999	\$400k for 40 or fewer, \$700k for 41-60, \$1M for 60-100, and \$1.5M for greater than 100 units	\$20M	\$118.5M
Missouri	1990	70% of federal credit (9-percent); discretionary amounts per project (4-percent)	\$3M (bond-financed 4%)	N/A (suspended 2017-20)
Nebraska	2016	100% of federal credit (9- and 4-percent credit)	None	\$1.5M (FY20)
Nevada	2019	Discretionary amounts per project (9- and 4-percent)	\$10M	N/A
New Jersey	2021	Federal 4-percent credit projects eligible for NJ Aspire program credits	N/A	N/A
New Mexico	2006	Up to 50% on donations to qualified projects approved by NM Mortgage Finance Auth. or to NM Charitable Trust	N/A	N/A
New York	2000	Discretionary, up to \$125k per unit	None	\$51M
Oklahoma	2014	100% of federal credit (9- and 4-percent credit)	\$4M	\$507k (FY20)
Pennsylvania	2020	100% of federal credit (9- and 4-percent credit)	None	\$10M
South Carolina	2020	100% of federal credit (9- and 4-percent credit)	None	\$25M
Utah	1994	A fraction of the federal credit varying by year and project qualities (9- and 4-percent credit)	None	FY22 N/A; 2018 ~\$2M
Vermont	2000	Discretionary	\$400k	\$20,000 (FY22)
Virginia	2021	100% of federal credit (9- and 4-percent credit)	\$15M	N/A
Wisconsin	2018	3-percent credit for 6 years on federal 4-percent projects	\$7M	Minimal

Source: Program details from Novogradac (at <https://www.novoco.com/resource-centers/affordable-housing-tax-credits/application-allocation/state-lihtc-program-descriptions>) and reviews of relevant state laws. Claims estimates are from respective state's tax expenditure reports, legislative analyst office estimates, budget documents, and similar state sources.

Reviews of State Programs

We were able to identify only a limited number of reports on other states' LIHTC programs that are presently available, including audit reports and a cost-benefits analysis of Missouri's program as well as a comprehensive evaluation of Oklahoma's program. Highlights of these assessments are provided below. Georgia's LIHTC was the subject of an economic impact analysis published in 2006; that analysis is discussed here as well.

Missouri

Missouri's state auditor conducted several reviews of their state LIHTC, using data from the state's Department of Economic Development and Department of Revenue, the first one being conducted in 2008 and the most recent in 2017.¹⁸ The Missouri Housing Development Commission (MHDC) also published a report in 2018 of economic impact and cost-benefit analyses of the state's LIHTC.¹⁹ Highlights of the reports are as follows:

- All three reports from the state auditor concluded that the economic impact of the program reported annually by the state Department of Economic Development (DED) to the state General Assembly consistently overstates the program's impact. The principal reason given is the underlying assumption in the economic impact estimates that no projects receiving the state LIHTC would have occurred in the absence of the credit, even though the state credit was small compared to the federal LIHTC and other federal subsidies received.
- Benefit-cost ratio (BCR) estimates (present value of projected revenues to the state per \$1 present value of credits) made by DED and reported in the audit reports range from 8 cents of benefits in 2013 and 12 cents in 2016 per \$1 of credits to 56 cents per \$1 of credits in 2007. The 2018 MHDC report estimates a BCR ratio for 2011-16 LIHTC projects of 48 cents per \$1 of credits.
- The auditor's reports also noted the inefficiency of the tax expenditure for LIHTCs, finding in 2014 that only about 42 cents out of each \$1 of credits funds construction of housing; the 2008 audit estimated that 35 cents per \$1 of credits went to construction. At the time, 35 cents of the difference was attributed to adverse federal tax effects of utilizing the state credits, an effect that would be smaller after the reductions in corporate (and to a lesser degree personal) tax rates in 2018, and the remainder to the discounting of the 10-year credit stream and to syndication fees and related soft costs.

Oklahoma

An evaluation of Oklahoma's Affordable Housing Tax Credit used an IMPLAN input-output analysis to estimate the economic impact and tax revenues generated from the construction phase

¹⁸ Office of the Missouri State Auditor (2008), "Analysis of Low Income Housing Tax Credit Program", Report No. 2008-23, <https://auditor.mo.gov/press/2008-23.pdf>; ___ (2014), "Low Income Housing Tax Credit Program", Report No. 2014-014-23, <https://auditor.mo.gov/AuditReport/ViewReport?report=2014014>; ___ (2017), "Tax Credit Programs", Report No. 2017-051, June 2017, <https://app.auditor.mo.gov/Repository/Press/2017051896073.pdf>

¹⁹ MHDC (2018), "Cost/Benefit Analysis of the Missouri Low-Income Housing Tax Credit Program", <http://www.mhdc.com/download/COST-BENEFIT-MOLIHTC.pdf>

of projects allocated state LIHTCs in 2015-17. The report estimated that the projects would generate about \$10.4 million in tax revenue from the direct, indirect, and induced effects of the construction activity, against which the developers would earn \$11.6 million per year of tax credits for 10 years or \$116.5 million in total. The authors did not consider economic impacts or tax revenues generated during the operational phase of the projects. The report also observed that project costs, on a per-unit basis, rose by about 11 percent on average in the first three years of the state program compared to the prior five years. Finally, the report concluded that Oklahoma's need for more affordable housing was high compared to the rest of the nation, but that because the state credit was not available for projects in the three Oklahoma City and Tulsa metropolitan counties (only counties with fewer than 150,000 residents are eligible), it excluded 43 percent of the state's population and was unable to address the areas of greatest need.²⁰ The state dropped the exclusion of the larger counties in 2019 legislation (HB 1411).

Georgia

An early economic impact report on Georgia's LIHTC was commissioned by the Georgia Affordable Housing Coalition and published in 2006. The report's IMPLAN evaluation of 15 projects (25 thousand units) during the first three years of the state LIHTC shows an increase in construction-related economic activity by about \$3.4 billion, with the program being credited for generating approximately 12,000 jobs from 2001-03. Another \$1.1 billion of economic impact, in present value terms, was estimated for 20 years of operations of the developments. However, the authors explicitly assumed, without question, that none of the 15 projects would have occurred absent the state-level credit. Net fiscal impacts of the 15 projects ranged from 10.9 cents to 53.5 cents per \$1 present value of credits, averaging 27.5 cents.²¹ These results counted construction-phase and the present value of 20 years of operating-phase tax revenues against the present value of the 10 years of tax credits.

²⁰ PFM Group Consulting (2018), "Affordable Housing Tax Credit Program", prepared for the Oklahoma Incentive Evaluation Commission,

https://iec.ok.gov/sites/g/files/gmc216/f/Affordable%20Housing%20Tax%20Credit_11.20.18_FINAL.pdf

²¹ Sweaney, Anne L., Jeffrey H. Dorfman, Jorge H. Atilas, Warren P. Kriesel, Thomas F. Rodgers, and Karen Tinsley (2006), "The Economic Impact of Low-Income Housing Tax Credits in Georgia", prepared for the Georgia Affordable Housing Coalition,

<https://www.gahcoalition.org/content/documents/LIHTC%20Final%20report%20060206.pdf>

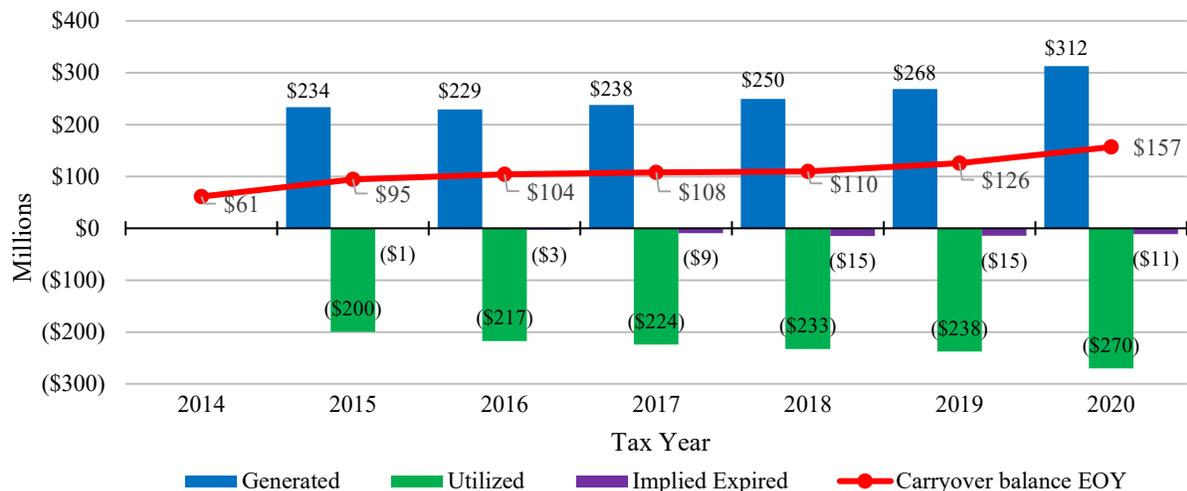
V. LIHTC Tax Expenditure and Administrative Cost Estimates

Credits Claimed, Utilized, and Carried Forward

Reporting from DOR indicates that, for tax year (TY) 2020 tax returns processed through April 1, 2022, approximately \$123.0 million of LIHTCs were claimed (or earned) by Georgia personal and corporate taxpayers, while \$82.2 million of carryforwards from prior years' unutilized credits were also available to be used against TY 2020 tax liabilities. A total of \$80.9 million of LIHTCs have been utilized on 2020 returns processed to date while carryforward balances increased to \$120.8 million. Meanwhile, OCI reports that \$189.5 million of LIHTC have been utilized against insurance premium tax (IPT) liabilities for TY 2020 (credits generated and carryforward balances are not reported by OCI), bringing the total utilized against TY 2020 tax liabilities to date to \$270.4 million.

Imputing amounts of LIHTCs generated and carried forward for periods after TY 2015 by insurers in the state, based on an OCI tabulation from audits of 2015 IPT returns, we estimate that a total of \$312 million of LIHTCs were generated in TY 2020 and about \$157 million of carryforwards remain available to be utilized against subsequent years' tax liabilities. A relatively small \$11 million is presumed to have expired without being utilized in 2020, though this amount is likely to be reduced (and amounts utilized increased) as delayed or amended returns are processed, or audits completed. Figure 10 shows the amounts of LIHTCs generated, utilized, or (presumed) expired in TYs 2015-20 along with end-of-year carryforward balances reported or, in the case of IPT, imputed.

Figure 10. Reported LIHTCs Generated and Utilized, and End-of-Year Carryforward Balances with Implied Expiring Credits by Tax Year*



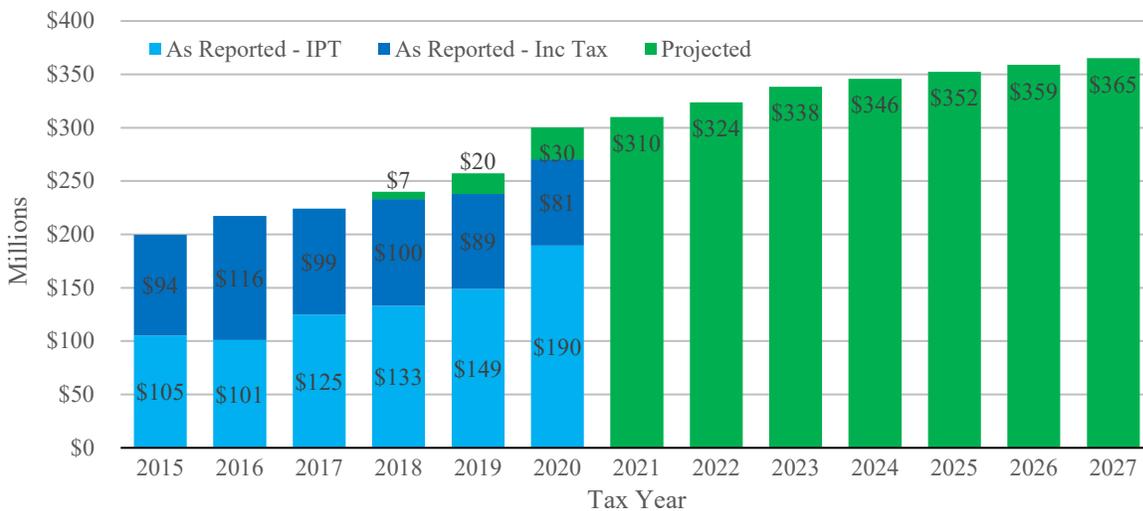
Sources: DOR and OCI

* Generated, utilized, and implied-expiring credits as well as end-of-year carryforward balances include as-reported data from DOR for income tax credits on returns processed through April 1, 2022, as well as estimated insurance premium tax credit data based on utilized credit amounts reported by OCI for 2016-20 (audited in full through 2018, partially for 2019-20) and an OCI tabulation of audited LIHTC credits generated, utilized, and carried forward in 2015. No similar tabulation, with credits generated and carried forward, for years after 2015 is available; OCI reports that carryforwards of this credit are not tracked.

We project LIHTC tax expenditures (amounts utilized) by tax year through 2027, including estimated amounts from as-yet unprocessed returns for TY 2018-20, using the same methods used in nearer-term projection for the Georgia Tax Expenditure Report, updated for new DOR and OCI data received since that report was last prepared (for FY 2023). Growth in credits generated is based on growth rates of federal LIHTC tax expenditures for 2021-24, as estimated by the congressional Joint Committee on Taxation (JCT) in 2021, with growth for 2025-27 at the 2024 JCT rate. Assumptions about relative amounts utilized, carried forward, or expiring each year are based on historical Georgia data.

As shown in Figure 11, we estimate the TY 2022 tax expenditure at approximately \$324 million, growing over the next five tax years to \$365 million. Adjusting to fiscal years, as in the Tax Expenditure Report, we now estimate the FY 2023 tax expenditure at approximately \$331 million and that of FY 2027 at \$362 million. Based again on historical data, we anticipate that about 63 percent of the FY 2023 tax expenditure will be through the IPT, 28 percent through personal income taxes, and 9 percent through the corporate income tax.

Figure 11. As-Reported and Projected LIHTC Utilization by Tax Year



Sources: as-reported amounts from DOR and OCI; projected amounts are Fiscal Research Center estimates, updating and extending FY 2023 Tax Expenditure Report estimates for new data received since its publication.

Administrative Costs

The three agencies responsible for administering the LIHTC program and the credits claimed under the program by Georgia taxpayers reported the following regarding administrative costs:

Department of Community Affairs Administrative Costs and Fee Revenues

DCA officials reported that administration of the state and federal programs is supported by fee revenue and that as a result, no state funds are used. DCA collected approximately \$4.7 million

in state and federal LIHTC fees in FY 2021 and \$12.4 million over that last three years to support the administration of both programs.

Department of Revenue Administrative Costs

DOR estimates that administration of this credit requires the full-time equivalent (FTE) of one professional at the level of Tax Examiner Specialist (Tax Credits), with a salary of \$50,210 before benefits, if at the midpoint of the current range for such position.²²

Based on this salary and FY 2022 Personal Services Fringe Rates reported by the Governor's Office of Planning and Budget (OPB), the current annual administrative cost to DOR is estimated to be approximately \$84.1 thousand.²³

Office of Commissioner of Insurance and Fire Safety Administrative Costs

OCI estimates costs totaling "roughly \$2,000 to \$2,500 in employee hours each year" for work including creating tracking spreadsheets, based on information provided by DCA, for an average of around 60 new credits each year and for regular audit work. OCI did not specify, so we assume these figures are salary before fringe. At the high end of the given range, current annual costs are assumed to be \$4.2 thousand.²⁴

²² Estimates provided by email by Chester Cook, DOR assistant deputy commissioner for tax operations, on April 8, 2022.

²³ OPB fringe rates used include payroll taxes (7.65% of salary), health insurance (29.454%), Employees' Retirement System (30.43% for revenue agents, new plan), and employer match of 401k contributions (3% max). See <https://opb.georgia.gov/fy-2022-personal-services-fringe-rates> for more information.

²⁴ Estimates provided by email by Mandy Snipes, OCI premium tax director, on April 19, 2022.

VI. IMPLAN Economic and Fiscal Impact Analysis

LIHTC projects involve measurable economic activity in the construction sector that is temporary, lasting only during the construction period, which for this analysis assumed to be one year. Ongoing economic activity occurs as the housing units are rented to tenants over their useful lives, including expenditures for property management, marketing, maintenance, and other ongoing costs of operations.

In this section, we model both the construction sector activity associated with LIHTC projects and the annual operating activity to estimate the direct, indirect, and induced economic impacts of those projects. Results reported here include estimates of employment, wages, value added, and total output associated with the three levels of economic impact. In addition, as explained further below, we use these economic impact estimates to produce estimates of tax revenue impacts at the state and local levels from the construction and operating phases of the projects.

This analysis, as is customary in economic impact analyses, does not address the counterfactual or “but-for” question of whether these projects would occur absent the state credits, but we do consider in this section the opportunity cost of expending state revenues, through the tax code, to subsidize these projects. To do so, we estimate the economic impacts, as well as the resulting state and local revenues, associated with the state expending the same amounts on other public goods and services in the same proportions as reported in recent years’ budget reports. We address the but-for question in the next section.

Model Overview

To estimate the economic impact of the LIHTC in Georgia, we use IMPLAN, a regional input-output model that is widely used for economic impact analysis. IMPLAN estimates how an initial change in spending or revenue for any industry category works its way through a regional economy, using data on input-output relationships between any industry and its suppliers and customers within or outside the given region, in this case the state of Georgia. It also has data on the size of each industry in the economy in terms of revenue and employment at the state and county level. The model uses sector multipliers to estimate the impact of the initial spending by firms on suppliers of goods and services to the sectors of interest, or on labor. This analysis uses IMPLAN model data for the year 2019, adjusted forward to represent average annual revenues and wages in 2020 dollars. Below is a discussion of the relevant IMPLAN terms used in the report.

- Direct effects are the changes that initiate the ripple effects through the economy. For purposes of this analysis, direct effects are increased firm output (revenue) directly attributable to development activity during the construction phase or operating activities later, including the associated firm employment, labor income, and value added that is supported by this initial spending.
- Indirect effects are the economic activity supported by business-to-business purchases in the supply chain for construction activity firms. For example, a construction firm purchases raw materials and equipment needed in its building activity. Each of the

supplying businesses subsequently spends a portion of the money they receive on their own production inputs, which in turn prompts spending by the suppliers of these inputs. This spending continues but progressively diminishes in its in-state impacts due to “leakages,” which occur when firms spend money on imports (including imports from other states), taxes, and profits.

- Induced effects are economic activity that occurs from households spending labor income earned from the direct and indirect activities. This activity results from household purchases on consumption items such as food, housing, healthcare, and entertainment. The labor income spent to generate these effects does not include taxes, savings, or compensation of nonresidents (commuters) as these leave the local economy (leakage).
- Output is the value of production. This includes the value of all final goods and services, as well as all intermediate goods and services used to produce them. IMPLAN measures output as annual firm-level revenues or sales, assuming firms hold no inventory.
- We also report value added, which measures the contribution to state gross domestic product (GDP).
- Estimates of output changes resulting from construction activity or operations are then used to estimate state and local sales tax revenue.
- Labor income includes total compensation – wages, benefits, and payroll taxes – for both employees and self-employed individuals. Wage-gain estimates are used to estimate incremental state income tax revenue.
- Employment includes full-time, part-time, and temporary jobs, including the self-employed. Job numbers do not represent full-time equivalents, so one individual may hold multiple jobs.

Data

Data on construction, acquisition, and soft costs as well as credits allocated were obtained from DCA for all 9-percent credit projects for 2019-20 and all 4-percent credit projects for 2016-17, the latest year of project-level detailed data available for 4-percent projects. Additional data on 2018-20 4-percent projects were provided by DCA as well, but the data lacked project-cost breakdowns as were included in early years’ data. Table 2 uses the developers’ average budget shares of the various costs from 2016-17 to estimate the cost breakdowns for 2018-20. Table 2 shows tabulations of these data for the 9-percent credit, Table 3 for the 4-percent credit.

Construction-phase cost data include construction costs as well as related soft costs such as those for architectural, engineering, and legal services as well as financing and syndication fees for each project. Property acquisition costs are also included, though it should be noted that these costs are heavily discounted in estimating economic impacts. Within an input-output model, the purchase of real property does not represent an economic event, in that no creation of additional value is involved in merely transferring of ownership from one party to another. However, transaction costs associated with the purchases – e.g., legal costs, surveys, inspections, and financing fees – are considered by the model as part of the initial, direct expenditures. As the

2006 economic impact analysis of the Georgia LIHTC, these transaction costs are estimated to be 8 percent of the total acquisition costs.²⁵

The credit amounts shown in Tables 2 and 3 are the present value of the credits taken over the 10 years allowed and discounted by 2.625 percent, the approximate average of the 2- and 10-year treasury bonds as of this writing as a proxy for state treasury investment returns.

Table 2. LIHTC 9-percent Credits, Costs and Total Units by Year

(\$ millions)	Total Units	Construction	Acquisition	Soft Costs	Credits PV
		Costs	Costs		
2019	2,301	\$269.3	\$22.0	\$122.1	\$224.9
2020	2,448	\$351.5	\$27.9	\$151.4	\$254.0

Source: DCA data and authors' calculations

Table 3. LIHTC 4-percent Credits, Costs and Total Units by Year

(\$ millions)	Total Units	Construction	Acquisition	Soft Costs	Credits PV
		Costs	Costs		
2016	3,720	\$258.1	\$89.1	\$145.7	\$154.7
2017	5,492	\$330.0	\$219.2	\$183.4	\$203.2
2018*	8,145	\$731.7	\$360.5	\$410.1	\$418.2
2019*	8,849	\$836.9	\$412.4	\$469.1	\$495.3
2020*	11,073	\$1,241.8	\$611.9	\$696.0	NA

Source: DCA data and authors' calculations

* Construction, acquisition, and soft costs are estimates for these years

Note that the economic- and revenue-impact estimates below for the construction and operation of LIHTC projects are before consideration of opportunity costs associated with the tax expenditures for this credit. Opportunity costs are addressed later in this report section, under Alternative-Use Impacts.

These estimates are also before consideration of causality, i.e., whether the projects included in the analysis would have occurred anyway in the absence of the state credit program. This “but-for” question is addressed in section VII below.

Construction-Phase Analysis

Construction-Phase Economic Impacts

Table 4 reports the IMPLAN estimates of direct, indirect, and induced impacts for the construction phase, including soft costs of both the 9-percent and 4-percent projects. Based on correspondence with DCA, actual credit amounts earned on 2020 4-percent projects are likely to decline from the amounts allocated as not all the pre-approved projects will ultimately be undertaken. As such, we use the cost and credit amounts from 2019 for the 4-percent credits as

²⁵ Sweaney et al. 2006

inputs into the IMPLAN model, inflation adjusted to 2020 dollars. For the 9-percent projects, we use the 2020 cost and credit amounts. The IMPLAN sector codes used in the model were construction of new multifamily residential structures (58) and Architectural, engineering, and related services (457) for the construction and soft costs, respectively, and other real-estate services (447) for the relevant acquisition costs.

Table 4. Summary of Construction-Phase Gross Non-Recurring Economic Impacts*

(\$ millions)	Employment	Labor Income	Value Added	Output
Direct Effect	18,089	\$1,151.4	\$1,319.1	\$1,844.2
Indirect Effect	3,559	199.6	319.0	578.0
Induced Effect	7,971	378.7	719.1	1,231.4
Total Impact	29,619	\$1,729.7	\$2,357.2	\$3,653.5

Source: IMPLAN and authors' calculations

* Estimates for 2019 4-percent credit projects and 2020 9-percent credit projects, the most recent reliable data available.

Construction-Phase Revenue Impacts

Table 5 shows estimates for state and local tax revenues attributable to economic activity associated with the construction of the LIHTC developments. State income tax is estimated using employee compensation generated by IMPLAN. The labor income estimated during the construction phase is comprised mostly of architectural, engineering, and related services, where the average labor income is roughly \$87,000 per job, and construction jobs that have an average labor income of \$54,000. Using Georgia DOR tax collection data, specifically net tax liability as a percentage of federal adjusted gross income for filers around those income levels, average effective tax rates of 3.9 percent and 3.7 percent, respectively, are assumed, resulting in construction-phase income tax revenues of about \$64.7 million.

To estimate sales tax revenues, we use the model's estimated incremental output for the various retail sectors and make adjustments to arrive at estimates of taxable sales. For retail sectors, IMPLAN reports as output only the retail gross margin, not the total sales at retail, so these estimates are grossed up using average gross margin rates from IMPLAN for each retail sector to arrive at estimated sales to which the tax would be applied. The state sales tax is calculated using the state sales tax rate of 4 percent, and the local sales tax is calculated using an average local sales tax rate of 3.35 percent, the population-weighted average as of January 2022, according to the Tax Foundation. The state and local sales tax estimates are shown in Table 3.

Table 5. Construction-Phase Gross Non-Recurring State & Local Tax Revenue

(\$ millions)	State Revenue	Local Revenue*
Sales Tax	\$21.3	\$17.8
Income Tax	64.7	-
All other state taxes	24.3	-
Total	\$110.2	\$17.8

Source: IMPLAN and authors' calculations

* Local property tax revenues are estimated in the following section.

Roughly 78 percent of Georgia state tax collections are from personal income and state sales taxes. Georgia collects a host of other taxes that make up the remaining 22 percent on average. Two taxes, in particular, make up about half of the 22 percent, corporate income tax and title ad valorem tax (TAVT) on motor vehicles. Table 5 shows the estimated revenue from these other taxes assuming a proportional effect such that the 22 percent of total tax revenues hold for the economic activity resulting from LIHTC projects.

Local governments also collect fees for building permits and inspections. These items were included in the cost estimates of the projects and are reflected in the developer's total budget. Thus, we do not include them here to avoid double counting. Local governments also receive property taxes to be collected annually during the useful life of the LIHTC projects. This analysis is addressed as part of the operating-phase revenue impacts discussion below.

Operating-Phase Analysis

Operating-Phase Economic Impacts

Another source of economic impact associated with the new low-income housing developments is the ongoing operations of the properties and associated spending on maintenance and other operating costs. Incremental direct output in the operating phase consists of the added rent revenue from the LIHTC projects. Based on LIHTC application records, we estimate annual gross potential rents starting at approximately \$90.5 million from all 4-percent projects and \$22.4 million from 9-percent projects.

Lacking data from which to estimate pre-acquisition/rehabilitation rents on acquired/rehabilitated properties, we exclude these from the analysis and consider the economic impacts of the new-construction projects. Based on DCA project data, we estimate that approximately 56 percent of net rental income from 4-percent projects and about 98 percent from 9-percent projects is from new rental units, bringing incremental gross potential rents to \$72.4 million. Using an assumed vacancy rate of 5.9 percent, based on estimate from the National Apartment Association (NAA) 2019 Survey of Operating Income and Expenses, incremental rent revenues are reduced to \$68.1 million.

These added revenues represent the direct effect on output of the tenant-occupied housing sector, code 448, and fund direct labor as well as purchases of goods and services used in the operation and maintenance of the properties. These, direct and indirect effects, along with resulting induced effects, are reported in Table 6. These are annual effects in 2020 dollars, which would be expected to continue over the useful life of the property.

Table 6. Summary of Operating-Phase Gross Annual Economic Impacts

(\$ millions)	Employment	Labor Income	Value Added	Output
Direct Effect	179*	\$3.2	\$60.1	\$68.1
Indirect Effect	37	\$2.5	\$4.4	\$8.0
Induced Effect	33	\$1.6	\$3.0	\$5.2
Total Impact	250*	\$7.3	\$67.6	\$81.3

Source: IMPLAN and authors' calculations

* Note that the tenant-occupied housing sector in IMPLAN is comprised of mostly smaller establishments that are treated separately but may be under common management. An additional worker hired for property management or maintenance may work on more than one property, but IMPLAN would count each as a new job that appears to earn only part-time levels of income. Thus, the direct and total effects on employment would be materially overstated, while the labor income effects would be more realistic.

Operating-Phase Revenue Impacts

Table 7 provides estimates for state and local tax revenues attributable to the economic activity associated with the operation and maintenance of the included LIHTC projects. State and local sales tax and income tax are estimated in the same manner as in the construction-phase analysis. We estimate the average effective tax rate on labor income in the operating phase, calculated on federal adjusted gross income, to be about 3.7 percent, resulting in approximately \$0.27 million (2020 dollars) of state income tax revenues annually. State and local sales taxes from resulting retail activity are estimated, respectively, at \$0.09 and \$0.07 million.

As with sales taxes, IMPLAN generates estimates of property tax effects, but they suffer from similar problems in that actual property tax rates are not used in the model. However, local property tax impacts will be important as the LIHTC is associated with substantial new construction as well as improvements to existing real property.

To estimate the incremental property tax base from the LIHTC projects, we first estimate the fair market value (FMV) of the projects using the income approach to valuation. That is, we capitalize the estimated annual net operating income from project units, net of cash operating expenses such as taxes, management fees, and maintenance. Gross potential rents, as discussed above, total approximately \$112.8 million. The National Apartment Association (NAA) 2019 Survey of Operating Income and Expenses estimated that operating costs and losses to vacancies represented 39.8 percent of gross potential rents, on average. Net of these costs, annual operating income of the properties is estimated to be approximately \$67.9 million.

To estimate the FMV, we use a capitalization rate (commonly referred to as the “cap rate”) of 5.55 percent, real estate investment firm CBRE’s estimate of the average cap rate for multifamily housing in the southeastern U.S. in Q1 2020, less assumed growth at 2.0 percent, the Congressional Budget Office’s (CBO) long-run core-PCE inflation forecast as of January 2020.²⁶

²⁶ CBRE (2022), “Multifamily Cap Rate Compression Continues in Q4 2021”, <https://www.cbre.us/real-estate-services/directory/valuation-and-advisory-services/valuation-cap-rate-reports/articles/us-multifamily-cap-rate-report>; CBO (2020), 10-Year Economic Projections as of Jan. 2020, <https://www.cbo.gov/about/products/budget-economic-data#4>

The resulting estimate of FMV for the included LIHTC projects totals approximately \$1,913.2 million, from which we subtract the acquisition costs of land for new construction and existing housing for rehabilitation projects, for an estimate of incremental FMV of \$1,473.0 million. The added property tax base (i.e., incremental assessed value) in Georgia would be 40-percent of that amount or \$589.9 million. Annual property tax revenue on this amount is calculated using a weighted average of millage rates for the locations of the included projects (weighting by estimated gross rents), about 39.1 mils. Finally, to this amount, we add a small amount (about \$0.1 million annually) of property tax revenues resulting from the indirect and induced economic activity during the operating phase.

Table 7. Operating-Phase Gross Annual State & Local Tax Revenue

<i>(\$ millions)</i>	State Revenue	Local Revenue
Sales Tax	\$0.09	\$0.07
Income Tax	\$0.27	-
All other state taxes	\$0.10	-
Property tax	-	\$23.15
Total	\$0.46	\$23.22

Source: IMPLAN and authors' calculations

Alternative-Use Impacts

Alternative-Use Economic Impacts

The LIHTC economic impacts estimated above do not take into account the opportunity costs of the forgone state revenues, i.e., the economic impacts of alternative uses of the funds expended through the tax credits. SB 6 requires evaluations of tax incentives to include estimates of *net* economic and fiscal impacts, thus requiring consideration of the economic and revenue effects of alternative uses of the funds spent, through tax credits, on this program.

Alternatives could include other economic incentives, spending on other policy areas across state government, or a reduction in taxes that could also result in direct, indirect, and induced economic effects. However, absent information as to how the General Assembly would otherwise choose to spend foregone revenue, if not on LIHTC, we estimate the impact of using the revenue to fund an equivalent increase in state government spending generally, in proportion to existing expenditures. That is, we allocated the foregone revenue to industry sectors as direct effects based on the sector shares of spending in the state budget. The two largest categories of spending – education (53 percent) and healthcare (21 percent) – account for roughly 75 percent of the budget (see the appendix for more detail on the shares allocated to different government services and the IMPLAN industry codes most closely corresponding to the service categories).

As shown in Table 8, if the state received the forgone revenue associated with LIHTC (the 10-year stream of credits) and spent the money, it could be expected to generate approximately \$158.7 million in output annually over the 10-year period. This estimate includes \$88.5 million in annual direct government outlays, the annual amount of credits from the LIHTC projects

included above, plus the amounts shown for indirect and induced effects resulting from the initial, direct outlays.

Table 8. Summary of Alternative-Use Annual Economic Impacts

(\$ millions)	Employment	Labor Income	Value Added	Output
Direct Effect	1,367	\$63.2	\$60.9	\$88.5
Indirect Effect	202	\$10.0	\$16.9	\$32.7
Induced Effect	432	\$20.5	\$39.0	\$66.8
Total Impact	2,000	\$93.6	\$116.7	\$187.9

Source: IMPLAN and authors' calculations

Alternative-Use Revenue Impacts

New tax revenues resulting from this alternate use case are estimated in a similar manner as that generated by the ongoing property management activity in the earlier section and are shown in Table 9.

Table 9. Alternative-Use Annual State and Local Tax Revenue

(\$ millions)	State Revenue	Local Revenue
Sales Tax	\$0.82	\$0.69
Income Tax	\$3.46	-
All other state taxes	\$1.21	-
Property tax	-	\$1.30
Total	\$3.99	\$1.63

Source: IMPLAN and authors' calculations

Summary of IMPLAN Economic Impacts

Comparisons between LIHTC and alternative use economic impacts should be made cautiously due to the limited scope of benefits estimated. The analysis is limited to construction and ongoing operations of LIHTC housing units in terms of measurable economic outcomes – jobs, wages, state GDP, total state output, and state and local tax revenues. The intent of this incentive may involve less tangible or less easily measured outcomes, benefits to both the tenants and the larger community. Nevertheless, Table 10 summarizes the economic impacts, and the state and local tax revenue impacts, *assuming again that the included LIHTC projects would not have occurred in the absence of the state credit.*

The first-year effects are those from the construction phase of the LIHTC projects, assumed for simplicity to be completed in one year. Ongoing operation of the properties provides economic benefits and incremental tax revenues for potentially many years. The costs of the program include the tax credits, earned over 10 years (starting year two, assuming one year for construction), and the foregone, alternative use of the funds for the same 10 years.

To account for the benefits that accrue over time from the LIHTC projects, we report the present value of the operating impacts over the first 15 years of operations, the LIHTC initial compliance period during which low-income units must be allocated to qualifying tenants and credits are subject to possible recapture in the event of noncompliance. Discount rates used are the Q1 2020 average of 2- and 10-year U.S. Treasury rates, as a proxy for the state's expected return on invested funds. With the exception of annual tax credit costs, all flows are also assumed to grow with the long-run expected rate of inflation at the time, 2.0 percent annually.

Table 10. IMPLAN Economic and Revenue Impacts Summary*

(\$ millions)	Construction	Operating PV**	Total
Economic Impacts:			
LIHTC Projects Impact	\$3,653.5	\$1,130.3	\$4,783.8
Alternative Use Impact	-	(\$1,769.9)	(\$1,769.9)
Economic Impact Net of Alt. Use	\$3,653.5	(\$639.6)	\$3,013.9
Revenue Impacts:			
LIHTC Revenue (Cost)		(\$749.4)	(\$749.4)
Offsetting State Rev. Gains	\$110.2	\$6.4	\$116.6
State Revenue Impact	\$110.2	(\$743.0)	(\$632.8)
Local Revenue Gains	\$17.8	\$323.1	\$340.9
Gross Revenue Impact	\$128.1	(\$420.0)	(\$291.9)
Alt. Use Revenue Impact:			
State	-	\$51.6	\$51.6
Local	-	\$18.7	\$18.7
Total Alt. Use Revenue		\$70.3	\$70.3
Revenue Impacts Net of Alt. Use:			
State	\$110.2	(\$794.6)	(\$684.4)
Local	\$17.8	\$304.4	\$322.2
Total Revenue Impact Net of Alt. Use	\$128.1	(\$490.3)	(\$362.2)

Source: IMPLAN and authors' calculations

* The IMPLAN model estimates all economic activity associated with the projects, which overstates the impact of the credit whenever some of the projects would occur even in the absence of the state LIHTC. The next section of the report addresses this question of what portion of the projects and resulting economic activity is attributable to the state credit and what portion likely would have occurred anyway.

** Present value of impacts are reported, including 15 years of operating impacts and 10 years of credits, thus 10 years of alternative use impacts as well.

VII. “But-For” Analysis: Testing the Counterfactual

While the preceding analysis does consider opportunity costs of tax expenditures under the Georgia LIHTC program by comparing the estimated economic impact to that of generic state-government spending, an important question remains about the program’s economic impact. As is common in economic impact analyses using IMPLAN or similar models, the economic impact estimates above do not address the “but-for” question:

But for the existence of the Georgia LIHTC, would these low-income housing investments have been made anyway?

If the answer is yes, even in part, then the economic impact estimates above are overstated. That is, some portion of the estimated output and revenue from the construction and operations phases of LIHTC developments would have occurred even in the absence of the state credits and thus should not be attributed to them.

Does the Georgia LIHTC Impact Low-Income Housing Supply?

Considering the federal LIHTCs necessarily provided to these same projects, qualifying for which is a condition to receiving the Georgia credits, and considering the assorted other subsidies available to encourage low-income housing development, the but-for question is not an unreasonable one to ask. To attempt to answer this question, we use econometric methods and data described below to test whether, all else the same, development of low-income housing units in Georgia communities is measurably greater than in similar communities outside of Georgia that lack a state-level LIHTC. We begin with a description of the data and methods we use, followed by the results and our conclusions.

Data and Methods

This portion of the evaluation is based on two primary data sources. The first is the Department of Housing and Urban Development (HUD) LIHTC database, which provides geocoded locations for every project that has earned a federal LIHTC credit, the year the project was placed in service, the number of total and low-income units, and other information. The data cover the entire United States and from 1987 through 2019, though for reasons discussed in sections II and III above, we use data only through 2009. The outcome or dependent variable in our analysis is the number of low-income units placed in service in a given census tract in each of four five-year periods, 1990-94, 1995-99, 2000-04, and 2005-09.

The second source, the National Historical Geographic Information System (NHGIS), provides “geographically standardized” time series of demographic and other variables used as explanatory variables and for the matching process discussed below.²⁷ For more on these data, see the appendix.

²⁷ Manson, Steven, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. <http://doi.org/10.18128/D050.V16.0>

We used demographic and economic variables that are likely factors in demand for low-income housing, along with pretreatment (before enactment of Georgia’s LIHTC) low-income unit additions, to create a pool of matched census tracts in states with no state-level LIHTC.²⁸ The goal of matching is to create a control group that, pretreatment, exhibits a similar pattern or “parallel trends” in low-income unit additions to that of the Georgia census tracts.

This enables us to estimate a “treatment effect” of the policy. We do so in difference-in-difference regressions of low-income units placed in service on the various economic and demographic demand factors as well as dummy variables to indicate “treated” tracts, those in Georgia after the policy was adopted.

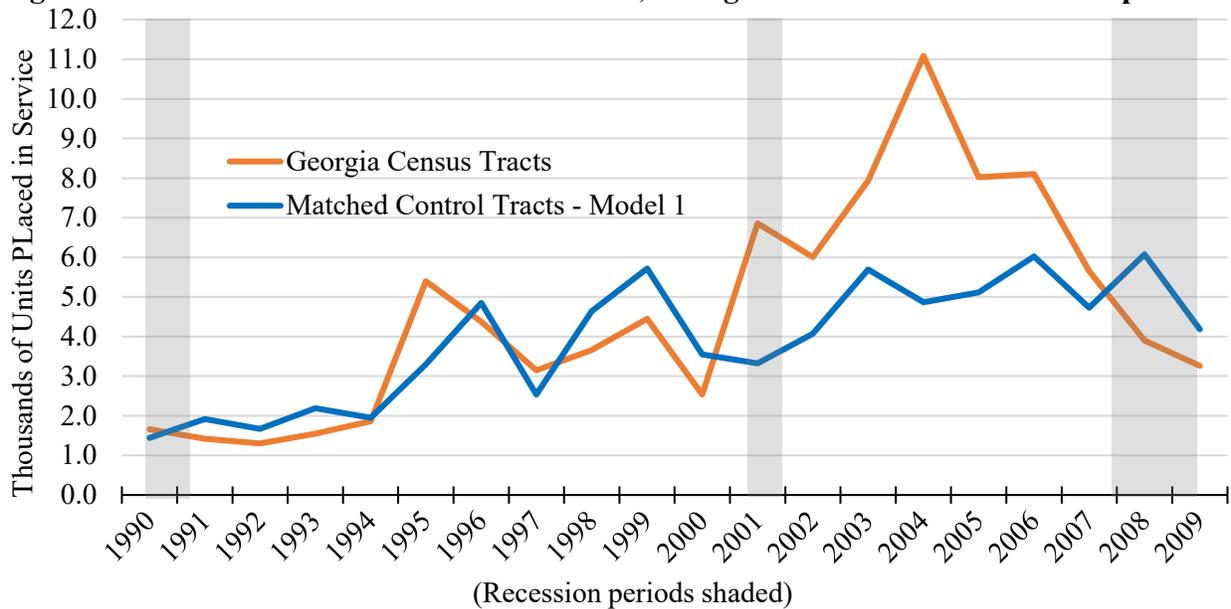
The result of interest – the estimated treatment effect – is the coefficient estimate for the interaction term, *Georgia*Post2000*, that is the product of the two dummy variables for Georgia tracts and for post-enactment periods. A value statistically greater than zero would allow us to reject the hypothesis that the state-level LIHTC has no effect on the supply of low-income units in Georgia and provide support for the alternative hypothesis that it increased the supply in Georgia after enactment.

Results

A simple plot (Figure 12) of the raw numbers of low-income units placed in service by year in Georgia census tracts compared to the control group of matched census tracts shows that the two groups do exhibit similar pretreatment trends and also suggests that, for most years after enactment of the Georgia credit (roughly 2001-07), there appears to have been an effect that did not persist during the Great Recession.

²⁸ We created two matched pools, one using 1995-99 low-income unit additions (model 1, shown in the results below) and the other the change in unit additions from 1990-94 to 1995-99 (model 2, shown in the appendix), along with the demographic and economic factors. Model 2 serves as a robustness check of the sensitivity of results to changes in matching criteria. As the appendix shows, the results are similar.

Figure 12. Low-Income Units Placed in Service, Georgia vs. Model 1 Control Group



Estimating how much of this difference is attributable to the policy requires controlling for other factors in the regression step described above. The results in Table 11 show that the estimated treatment effect, the coefficient on Georgia*Post2000, is about 4.01 with a standard error of about 1.67, making it statistically significant at the 5-percent level and allowing us to reject the null hypothesis of no effect of the policy.

The coefficient estimate can be interpreted as suggesting an additional 4.01 low-income units were placed in service in each of the first two 5-year periods after enactment for each of Georgia’s census tracts, on average. Statewide, this equates to about 15.7 thousand additional low-income units ($4.01 \cdot 1,957 \text{ tracts} \cdot 2 \text{ periods}$) during this period, compared to the number expected without the state-level credit. To put this into perspective, the total number of low-income units placed in service in Georgia over the 2000-09 period was 63.6 thousand, so based on these results, roughly 25 percent of those placed in service during the decade could fairly be attributed to the policy.

Table 11. Regression Results for Low-Income Units Placed in Service, 1990-2009

Variable	Model 1	
Georgia = 1	-0.488 (0.919)	
Post2000 = 1	-0.107 (2.102)	
Georgia*Post2000	4.007 (1.668)	**
Population Density	0.408 (1.283)	
Percent Under 18	0.273 (0.087)	***
Percent Black	0.499 (0.133)	***
Percent White	0.301 (0.135)	**
Percent Renting Home	0.124 (0.016)	***
Median Family Income (County) ⁺	0.377 (0.090)	***
Percent < Poverty Level (County)	0.134 (0.107)	
Constant	-62.63 (16.83)	***
Observations	15,642	
R-squared	0.051	

Regressions are OLS and include period fixed effects. Robust standard errors, clustered on tract, are in parentheses.

*** indicates significance at the 1% level, ** at 5%, and * at 10%

+ Income measured in thousands

Other explanatory variables – population, percent black, percent white, percent rental, and host-county median income – are statistically significant and positive. These results are generally as expected, though the expected income effect may seem counter-intuitive as it suggests more low-income units being built in higher-income census tracts, all else the same. However, one would expect greater income to be associated with greater demand for housing in general, holding other factors constant, resulting in more housing investment overall, including for low-income units. The positive and significant coefficient estimates on the percent black and percent white variables suggest either are associated with greater demand for low-income housing compared to census tracts with a higher percentage of the omitted category, residents who identify in the census as Asian, Latin, or another racial or ethnic group.

VIII. Impact to Public Benefit – Other Benefits

It is difficult to fully capture the economic and community benefits of an affordable housing program. Providing a family safe and secure long-term housing arguably has benefits for the public as well as the family, including on health and health spending, public safety, and educational outcomes, three areas that loom large in state and local government budgets. While it is beyond the scope of this analysis to attempt to measure these potential long-term public benefits of greater housing security, policy makers may wish to consider the value of the policy in achieving goals in these areas as well as the more easily measured economic and fiscal impacts. We highlight some of the literature here.

- A health policy brief from *Health Affairs* reviews the literature on four pathways by which housing security, or the lack thereof, impacts health and public health costs:²⁹
 - Stability – Homelessness is associated with greater physical and mental health problems, and greater risk of experiencing traumas. Housing instability “in the form of moving frequently, falling behind on rent, or couch surfing” is associated with “increased risks of teen pregnancy, early drug use, and depression.”
 - Safety and Quality – Poor environmental conditions in substandard housing have direct health consequences, including effects of lead paint on the nervous system as well as water leaks, mold, poor ventilation, pest infestations, and exposure to very high or low temperatures that are associated with asthma and cardiovascular events.
 - Affordability – Financial stresses of high housing cost burdens inhibit families’ ability to spend on regular medical care, prescriptions, or needed treatments as well as on food and educational costs, or to save.
 - Neighborhood – Environmental and social characteristics of where people live, including access to grocers with nutritious foods, safe public spaces for exercise, etc. also impact health and physical security.
- An article in HUD’s *Evidence Matters* quarterly addresses the impacts of housing conditions and security on public safety, offender recidivism, and youth opportunity.³⁰
- An Urban Institute *Housing Matters* article reviews, among other things, research into the effects of housing conditions and security on educational outcomes, including reduced proficiency and passing rates for homeless children, and lower high school graduation rate and educational attainment by age 25 for children who live in overcrowded households.³¹

The attribution of these benefits to the state LIHTC program, like the more easily measured economic and fiscal benefits estimated in earlier sections, depends on the same “but-for” question.

²⁹ Taylor, Lauren (2018), “Housing And Health: An Overview Of The Literature”, *Health Affairs*, <https://www.healthaffairs.org/doi/10.1377/hpb20180313.396577/>

³⁰ HUD Office of Policy Development and Research (2016), “Housing, Inclusion, and Public Safety”, *Evidence Matters*, <https://www.huduser.gov/portal/periodicals/em/summer16/highlight1.html>

³¹ Gaitán, Veronica (2018), “How Housing Can Determine Educational, Health, and Economic Outcomes”, *Housing Matters*, Urban Institute, <https://housingmatters.urban.org/articles/how-housing-can-determine-educational-health-and-economic-outcomes>

IX. Conclusions

In light of the economic and fiscal costs and benefits of the Georgia LIHTC discussed above, and the less measurable potential public benefits of improved housing affordability, it is important to note that the LIHTC is only one tool for addressing the affordability issue. It may not be the best or most efficient tool, even among the government subsidy options.

Other supply-side subsidy options, which are often available to the same projects that are receiving LIHTCs, include direct public grants and subsidized loan programs. Demand-side options include rent subsidies and vouchers. Some of the federal and state LIHTC reviews discussed above address the efficiency issues of LIHTC compared to demand-side programs.

There are non-subsidy options as well, though one is not wisely considered. Rent-control laws still regulate rents in the District of Columbia and various cities in California, New York, New Jersey, and Maryland as well as statewide in Oregon, but are generally criticized by economists for reducing the quality and quantity of housing rather than making it more affordable. Less obvious policy options include removing institutional barriers to the creation of more supply by reforming zoning laws and lending practices, and improving community planning to address affordability.

On its own merits, we find that while Georgia's LIHTC appears at first pass to provide large economic impacts in terms of output and employment, only a relatively small portion of these impacts are apparently attributable to the state credit as opposed to the federal LIHTC, other subsidies, or even just market conditions in the state. And, to the degree the economic impacts are attributable to the state credits, they come at considerable fiscal cost.

In particular, we estimate that only about 25 percent of low-income units placed in service since enactment can be attributed to the state credit, the balance being likely to have been built absent the state credit. This limited attribution of the added units to the state credit, however, does not reduce the tax expenditure cost or the opportunity cost of using the funds on other government programs and services.

X. Appendix:

Value of Alternative Use – IMPLAN Code Table

Table A1 shows the approximate breakdown of state expenditures into functional areas that either directly correspond or are similar to the specified IMPLAN sectors in terms of the nature of labor and other inputs.

Table A1. Approximate Distribution of State Expenditures

Category	Share state spending	IMPLAN codes	IMPLAN Sector Descriptions
Education	53%	480,481	Elementary and secondary schools, and post-secondary education
Health Care	21%	486	Outpatient care centers
Public Safety	8%	475,478	Investigation and security services, and other support services
Transportation	7%	457	Architectural, engineering, related svcs.
Economic Development	4%	442	Other financial investment activities
Admin. and Other	7%	446	Funds, trusts, and other financial vehicles

Source: Spending shares based on Georgia Budget in Brief for FY 2019, <https://opb.georgia.gov/budget-briefs>

“But-For” Analysis – Further Details on Data and Methods

The project-level HUD data were aggregated up to census-tract and county levels for Georgia and for other states, covering 1990-2009 and aggregated into five-year blocks, two periods before Georgia’s LIHTC was enacted and two after.

The NHGIS dataset is comprised of survey data from the 1990-2020 decennial censuses, standardized on 2010 census units (i.e., blocks, block groups, tracts, etc.) the geographic boundaries of which may change from one decennial census to the next. In other words, survey responses associated with different census tracts in the 1990 or 2000 census than in 2010 because of a census tract boundary change are, for our purposes, grouped for all periods by their 2010 tract ID as if the 2010 boundaries were in place for all periods.

To create the control groups of census tracts (or counties), each Georgia tract (county) was statistically matched, based on the demand factors above as of the 2000 census (i.e., just before Georgia’s LIHTC became available to developers) and pretreatment low-income unit additions, to counties or tracts in states that do not have a state-level LIHTC or similar credit. Matches were selected using nearest-neighbor matching, a process that measures the statistical distance between any two observations in a dataset to identify, for each treated observation, the closest or most similar observation among all the potential control observations. The distance measure we use is Mahalanobis distance, the sum of squared differences between the variables used for matching.

Variables used for the matching process include population density, percent of population under 18 years of age, percent black, percent white, median family income, percent living in poverty, percent living in rental housing. These variables were measured as of the beginning of each five-year period of aggregated low-income housing unit data. Because intercensal values for most control variables are not available on a geographically standardized basis, values for years not corresponding to decennial census years are interpolated using the decennial census values immediately prior to and after the given year.

In addition, we included as a matching variable the pretreatment number of low-income units added in 1995-99 or the change in unit additions from 1990-94 to 1995-99. That is, we created two matched pools, one using the former (model 1, with regression results shown in section VII) and the other the latter (model 2, shown in this appendix). Model 2 serves as a robustness check of the sensitivity of results to changes in matching criteria.

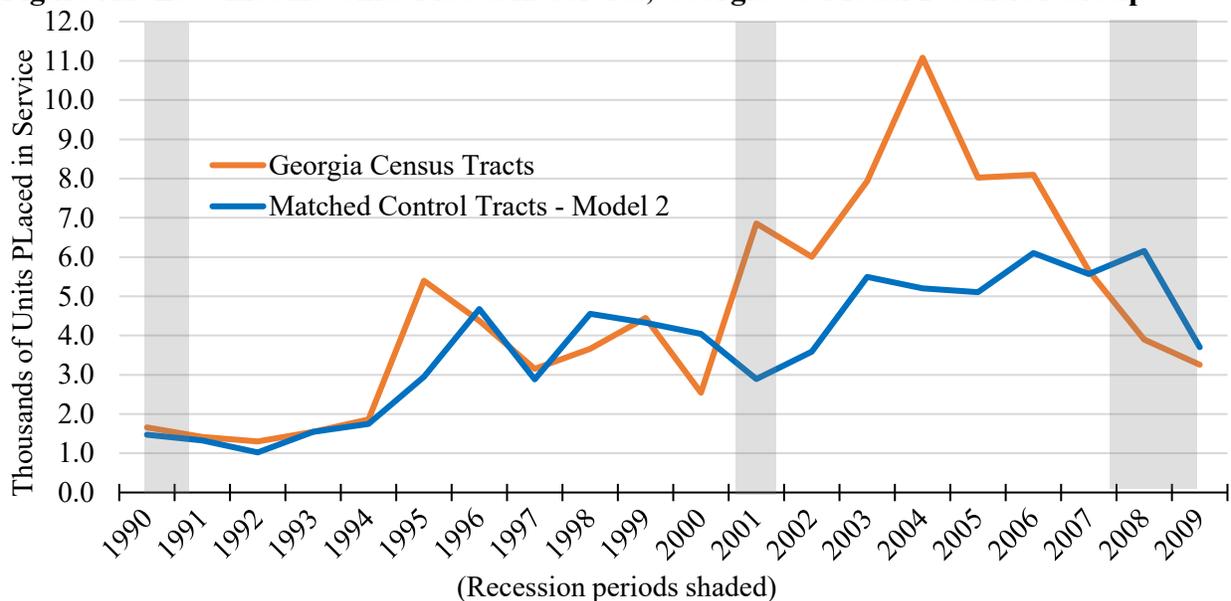
Table A2 below provides census-tract covariate balance statistics for models 1 and 2, including the means of the various matching variables for Georgia and statistics showing how similar the matched control units are to the treated (Georgia) census units, compared to the unmatched pool of all untreated census units. Figure A1 compares Georgia low-income unit additions to those of the model 2 control group (Figure 12 in section VII shows the model 1 control group).

Table A2. Covariate Balance, Georgia vs. Untreated Census Tracts (2020 values)

	Georgia	Unmatched		Matched - Model 1		Matched - Model 2	
Observations	1,957	70,501		1,957		1,957	
Covariate	Mean	St. Mean Diff.	Var. Ratio	St. Mean Diff.	Var. Ratio	St. Mean Diff.	Var. Ratio
Pretreatment Units	11.6	0.108	2.413	0.006	1.035	0.011	1.011
Population Density	0.6	-0.380	0.193	-0.007	0.971	-0.009	0.965
Percent Under 18	27.9	0.208	0.890	0.019	1.083	0.019	1.096
Percent Black	29.3	0.627	1.610	0.058	0.979	0.062	0.983
Percent White	64.9	-0.494	1.333	-0.061	0.981	-0.065	0.983
Percent Renters	82.3	0.154	1.278	0.034	1.047	0.039	1.057
Med. Family Income*	49.7	-0.017	1.034	0.033	1.007	0.033	1.004
Percent Under Poverty	13.6	0.258	1.264	0.006	1.002	0.004	0.999

* income in thousands

Figure A1. Low-Income Units Placed in Service, Georgia vs. Model 2 Control Group



The next step is to use the Georgia and matched control observations in a regression model to estimate the effect of the adoption of a state-level LIHTC on the number of low-income housing units built in the state, controlling for demographic and economic factors, compared to units built in similar untreated census tracts or counties. Dummy variables are used to indicate census units in the treated or control states (i.e. equal to one for Georgia, zero otherwise) as well as for periods before or after treatment, the adoption of the state credit in Georgia (i.e. equal to one for the 2000-05 period and later, zero before). We then regress the number of low-income units placed in service each 5-year period on the demographic and economic control variables, the “Georgia” and “post2000” dummy variables, and an interaction term multiplying the two, Georgia*post2000. We run the regression using ordinary least squares (OLS) with period fixed effects to control for period-specific factors affecting all census tracts.

The result of interest – the estimated treatment effect – is the coefficient estimate for the interaction term. A value statistically greater than zero would allow us to reject the null hypothesis that the state-level LIHTC has no effect on the supply of low-income units in Georgia and provide support for the alternative hypothesis that it increased the supply in Georgia after enactment.

Regression results for model 1 are provided in section VII of this report; model 2 results are presented in Table A4 below. Results are essentially the same between the two models. Though the estimated treatment effect is somewhat smaller, at about 3.06 units per tract per period compared to 4.01 in model 1, model 1 estimates it with better precision (a smaller standard error). Thus, our preferred model is model 1.

Table A4. Regression Results for Low-Income Units Placed in Service, 1990-2009

Variable	Model 2	
Georgia = 1	0.317	
	(0.857)	
Post2000 = 1	0.477	
	(2.094)	
Georgia*Post2000	3.058	*
	(1.646)	
Population Density	-0.048	
	(1.123)	
Percent Under 18	0.250	***
	(0.084)	
Percent Black	0.457	***
	(0.133)	
Percent White	0.263	*
	(0.134)	
Percent Renting Home	0.123	***
	(0.016)	
Median Family Income (County) ⁺	0.393	***
	(0.090)	
Percent < Poverty Level (County)	0.181	*
	(0.107)	
Constant	-59.92	***
	(16.79)	
Observations	15,646	
R-squared	0.051	

Regressions are OLS and include period fixed effects. Robust standard errors, clustered on tract, are in parentheses.

*** indicates significance at the 1% level, ** at 5%, and * at 10%

+ Income measured in thousands

Finally, we note that approximately 92 percent of observations used in the regressions – Georgia plus matched control tracts over the four periods – had zero low-income units placed in service in the given tract and period, the outcome variable in the regressions. A large share of zero values for the outcome variable has the potential of biasing estimates, so as an additional robustness check of our results, we ran the regressions again using a zero-inflated poisson (ZIP) model. The ZIP model works in two steps, first predicting the zero-unit outcomes and second predicting the count of units if greater than zero. Results for the treatment effect in both models were very close to the OLS estimates.