

# ECONOMIC IMPACT OF THE SOUTH CAROLINA RESEARCH AUTHORITY

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The Division of Research (Division) in the Moore School of Business, the University of South Carolina, has conducted a study of the economic impact of the South Carolina Research Authority (SCRA). SCRA collaborates with businesses, academic institutions, and other organizations to advance technology and promote the state's efforts to cultivate a knowledge-based economy. Their efforts contribute to the state's development in a myriad of ways: promoting technology capabilities, managing research parks, and helping foment small-business and entrepreneurial development through SC Launch! These activities produce tangible results: jobs and income for South Carolinians.

The Moore School study used information on SCRA activities for 2007 and assessed the total impacts with IMPLAN, a form of regional input-output (I-O) model, to quantify the statewide ripple (or multiplier) impacts of SCRA. The Division research team was responsible for tailoring the model to the SCRA and related activities. The main quantitative results are a set of summary statistics, including income, value added, and employment, describing the total economic impact. The research team assessed the three main dimensions of the SCRA's activities: operations, technology parks, and SC Launch!

The focus of the study was on the extent to which the SCRA helps create and retain the kind of high-paying jobs that South Carolina urgently needs. Raising per capita income remains a key goal of economic development in South Carolina. The surest way to move toward this goal is to add knowledge workers with incomes above the state average. On average, the direct jobs supported by the SCRA pay three times the state's median annual wage of \$25,850. On average, jobs in the SCRA parks pay \$55,914, well over twice the state's median wage.

The spending from this substantial income produces ripple effects for the state, leading to more employment and income not directly associated with the SCRA. The total (direct and indirect) SCRA impact encompasses 11,765 jobs, generating \$521.0 million a year in labor income for the state's economy. Directly and indirectly, the total net contribution to the South Carolina economy—what economists refer to as value added—totaled \$771.3 million in 2007.

The total economic impact of the SCRA operations, technology parks, and SC Launch! is \$1.4 billion in 2007. This is the value of all economic activities associated with SCRA in South Carolina during the year.

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Twenty five years ago, the State of South Carolina made a visionary decision to support SCRA. We can see how the state's one-time contributions of \$500,000 and 1,400 acres of undeveloped land continue to

pay dividends years later. Based on the value of the 1982 one-time contributions in today's dollars, we can see how this investment produces annual benefits. Using conservative assumptions, that is, assuming SCRA operations, parks, and SC Launch! are sustained and continue at the same level as 2007, then every \$1 contributed by the state will support \$620 in economic value for the South Carolina economy over the twenty years following 2007. This value added for South Carolina represents economic activity that otherwise would not be there to support spending and economic growth throughout the state. These annual dividends have grown and accrued every year since SCRA began and will continue in the future as long as operations, the research parks, and SC Launch! persist.

## INTRODUCTION

In the first decade of the 21<sup>st</sup> century, the prospects appear auspicious for transforming the state's economy to one powered by technology and entrepreneurship. The South Carolina Research Authority (SCRA) plays a vital role in this transformation. The SCRA is an applied research and commercialization services company with years of accumulated know-how and experience. With over 35 national and international programs, SCRA generates substantial income for the state through applied R&D contract work, small business technology development, and other activities.

Through SCRA technology support and related activities, millions of dollars are injected into local communities across the South Carolina. From research enhancement to small business development, few institutions have such a broad and far-reaching impact on the state. It has become essential to building the knowledge economy of South Carolina.

The aim of this study is to quantify the SCRA's economic impact on South Carolina. The study takes a broad look at the influence of the SCRA on the state's economy. The results are based on an analysis of the overall economic effects of SCRA for 2007.

Beyond the employment impacts engendered by any business or government institution, the SCRA helps the state attract and retain human capital, defined as the accumulation of investment in the skills and knowledge of the population. It is well known that knowledge

workers (with more education on average) earn far more than workers with less education. In fact, college graduates in the United States earn 84 percent more than those who end their education with high school. The gap is projected to grow over time, as firms will pay more for educated workers because they are more productive. This study will document that the effects of the SCRA in increasing the earning power in South Carolina through high-wage employment.

The intent of this report, then, is to assess the overall economic impact of the SCRA on the state economy. Although many citizens sense that a link between research, technology, and economic development exists, the connection is often not well understood. This study aims to present a clear and accurate assessment of the economic impact of the SCRA and contribute to our understanding of its effects on the well being of South Carolina.

In this study, SCRA is understood to encompass three major components: operations of the research authority itself, businesses located in the technology parks managed by SCRA, and a new relatively new entrepreneurial development program called SC Launch! The technology parks (Carolina in the Midlands area of the state, Clemson in the Upstate region, and Trident in the Low Country) comprise over a million square feet in facilities and office space. Meanwhile, SCRA's SC Launch! supports applied research, product development, and commercialization programs. Its goal is to bolster South Carolina's knowledge economy by creating high wage jobs and helping entrepreneurs build technology-based business startups. In this study, SCRA will be used to denote all three components: operations, parks, and SC Launch!

## METHODS: ASSESSING THE ECONOMIC RIPPLE EFFECT OF THE SCRA

The South Carolina Research Authority's operations and associated activities provide a major source of jobs and income for residents throughout the state. The SCRA brings millions of dollars in new money from outside South Carolina, leading to local spending that generates further income for state residents. These expenditures create an economic "multiplier effect." The SCRA's impact continues after the initial money is spent for goods and services. Thus, it supports many enterprises and individuals not directly connected to the SCRA.

Broadly speaking, the multiplier effect of the SCRA is a combination of direct, indirect, and induced impacts on local economies. The *direct* impact is the economic activity generated by the SCRA's in-state purchases. These local purchases generate further expenditures within the South Carolina economy, leading to *indirect* impacts. As suppliers and local vendors spend income received from the SCRA, businesses benefit further upstream. Moreover, wages are paid to employees as a result of the direct and indirect expenditures. The wage income then exerts an increase in expenditures via the local consumption of goods and services locally. These effects are called *induced* impacts. The sum of the direct, indirect, and induced impacts is the total economic impact.

The first step in an economic impact analysis is to compile information on direct dollar flows into the state. Information was

requested and received from the SCRA for this purpose. The data collected included employment, salaries, and in-state expenses.

Given SCRA expenditures, the multiplier impacts on the state were calculated using the IMPLAN model, a form of input-output analysis widely used across the United States. The impacts generated by IMPLAN produce the indirect and induced effects. In tailoring the IMPLAN model for SCRA, every attempt was made to gauge the effects with accuracy, using conservative assumptions.

IMPLAN's input-output model accounts for the linkages—including intermediate inputs and final consumer demand—that characterize the inner working of the South Carolina economy. IMPLAN has information for 508 industrial sectors (industries) that comprise the South Carolina. It is a highly complex and detailed set of equations that accounts for all industry purchases of commodities, services, employee compensation, value added, and imports, which are in turn set equal to the value of the commodities produced in the state. Purchases for final use (final demand) drive the model; in this case, the in-state expenditures of SCRA.

Impacts were calculated for four categories that reflect the contribution of SCRA to the state and local economy.

1. **Total Impact (or Output).** This is the contribution to overall economic activity.
2. **Employment.** This is the contribution to the job base.
3. **Labor Income (or Earnings).** This is the contribution to wages and salaries.
4. **Value Added:** The net overall contribution to the state's economy.

The total impact, employment, labor income, and value added impacts were calculated for each of the three major components of the SCRA (operations, technology parks, and SC Launch!). The total impact of the three components is the overall impact of SCRA on the state.

## RESULTS

### Employment

A summary of the impact results can be found in Table 1. Overall, the SCRA supported 11,765 jobs in South Carolina during 2007. The employment is the total of direct, indirect, and induced effects of all SCRA activities. Most of the jobs (10,931) can be attributed to the technology parks.

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### Total Impact

The total value of all goods and services associated with the SCRA amounted to \$1,436,325,955.

The total value of all goods and services associated with the SCRA amounted to \$1,436,325,955. This broad measure of economic impact includes sales of goods and services to

SCRA entities from in-state vendors. Again, the majority of this impact can be traced to the technology parks (\$1,343,505,400).

## Labor Income

For most citizens, the crucial component of the impact is the income generated for state residents. In 2007, the SCRA contributed \$521,078,193 to the state's economic well-being through labor income, with technology parks generating \$476,965,578 of this income.

## Value Added

The net contribution to the state's economy is known as value added. This measure is similar to gross state product (or gross domestic product for the nation as a whole). SCRA's 2007 value added was \$771,288,489. The technology parks led to \$717,696,296 in value added for South Carolina.

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	<i>Employment</i>	<i>Total Impact</i>	<i>Labor Income</i>	<i>Value Added</i>
Operations	750	\$82,919,939	\$39,027,819	\$47,652,828
SC Launch!	84	\$9,900,616	\$5,084,796	\$5,939,365
Technology Parks	10,931	\$1,343,505,400	\$476,965,578	\$717,696,296
<b>Total</b>	<b>11,765</b>	<b>\$1,436,325,955</b>	<b>\$521,078,193</b>	<b>\$771,288,489</b>

## CONCLUSION

The SCRA plays a critical role in achieving this higher level of economic development. But the competition is strong. Across the country and the world, governments and private sector organizations are stepping up activities to develop technology and spread the benefits to local citizens.

This study examined the impact of the SCRA, taking a comprehensive approach that looks at the various ways in which the system influences the economic well-being of South Carolina citizens.

When the three components of the SCRA—operations, technology parks, and SC Launch!—are summed the total impact is substantial. Total output—that is, the overall contribution to the state economy—amounts to \$1.4 billion. This level of economic activity supports 11,765 jobs, and provides \$521 million in total earnings.

Even so, the real value of the SCRA to South Carolina is impossible to quantify in all its many dimensions. Above all, the SCRA elevates the technological capabilities of local businesses, enabling firms to compete successfully in the knowledge-based economy. SCRA is a model business for the knowledge economy market space that South Carolina so desperately needs to cultivate and foster.